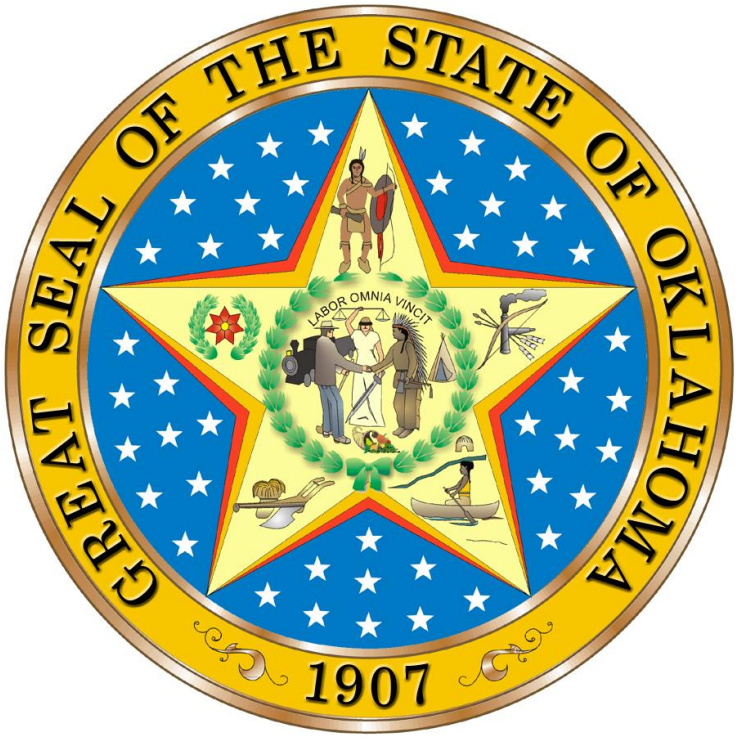
Continuing Planning Process

2012 Version



DEQ
OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY

With contributions from:

OKLAHOMA
CONSERVATION
COMMISSION

[This page intentionally left blank]

TABLE OF CONTENTS

TABLE OF CONTENTS I
LIST OF TABLES XI
CHAPTER 1 1
INTRODUCTION AND OVERVIEW 1
PRIMARY AGENCIES 1
OTHER AGENCIES 1
PROGRAMMATIC TERMS 2
ACRONYMS AND DEFINITIONS 4
CHAPTER 2 18
INTRODUCTION AND PURPOSE 18
WATER QUALITY STANDARDS AUTHORITY 18
STATE AUTHORITY 18
FEDERAL AUTHORITY 18
WATER QUALITY STANDARDS COMPONENTS 19
BENEFICIAL USES 19
EXISTING USES 20
ASSUMED USES 20
DESIGNATED USES 20
LITERATURE REVIEW 20
ONE-DAY SURVEYS 20
INTENSIVE SURVEY USE ATTAINABILITY ANALYSIS 20
CRITERIA TO PROTECT BENEFICIAL USES 20
GENERAL NARRATIVE CRITERIA 20
PUBLIC AND PRIVATE WATER SUPPLY 21
EMERGENCY PUBLIC AND PRIVATE WATER SUPPLIES 21
FISH AND WILDLIFE PROPAGATION 21
AGRICULTURE: LIVESTOCK AND IRRIGATION 22
PRIMARY BODY CONTACT RECREATION 22
SECONDARY BODY CONTACT RECREATION 22
NAVIGATION 22
FISH CONSUMPTION 22
AESTHETICS 23
ANTIDEGRADATION POLICY 23
SPECIAL REQUIREMENTS 23
COMPLIANCE SCHEDULES 23
VARIANCES 24
ENDANGERED SPECIES PROTECTION 24
REQUIREMENTS FOR DEVELOPMENT OF SITE SPECIFIC CRITERIA FOR METALS 24
BIOCRITERIA 24
PROCEDURES FOR REVIEW AND REVISION OF WATER QUALITY STANDARDS 24
MINIMUM REQUIREMENTS FOR WATER QUALITY STANDARDS SUBMISSION 24
TRIENNIAL REVISIONS 25
FEDERAL REQUIREMENTS 25
STATE REQUIREMENTS 25
PUBLIC NOTICE OF RULEMAKING INTENT 26
CONSIDERATION OF COMMENTS AND POSSIBLE EFFECTS ON SPECIFIED GROUPS 26
RULEMAKING HEARING 26
PREPARATION OF RULE IMPACT STATEMENT 26
ADOPTION OF THE PROPOSED RULE BY THE OKLAHOMA WATER RESOURCES BOARD 27
FILING WITH GOVERNOR, SECRETARY STATE, AND LEGISLATURE 27
GUBERNATORIAL REVIEW 27
LEGISLATIVE REVIEW 27
FINAL ADOPTION 28
FILING FINALLY ADOPTED RULE WITH SECRETARY OF STATE 28
PUBLICATION AND PROMULGATION 29
EFFECTIVE DATE 29

Publication Of Rules In The Oklahoma Register And The OAC 29
Non-Statutory Activities For Water Quality Standards Revisions 30
Emergency Water Quality Standards Rulemaking 30
Finding Of Compelling, Extraordinary Circumstance 30
Abbreviated Notice And Hearing, Rule Impact Statement 31
Adoption And Filing With Governor 31
Gubernatorial Approval Or Disapproval 31
Promulgation 31
Filing With the Legislature 31
Filing With Secretary Of State and Publication 31
Effective Term; Legislative Review 31
Coordination Of New Standards, Criteria And Implementation Policies 32
Water Quality Standards Criteria Modification 32
Water Quality Standards Implementation Modification 32
Water Quality Standards Implementation Documents 33
Purpose, Scope, And Applicability Of Implementation Documents 33
CHAPTER 3 34
Permitting Procedures 34
Introduction 34
Developing Effluent Limitations 34
Technology-Based Requirements 34
Effluent Limitation Guidelines (ELGs) 35
Treatment Levels 36
Categorization/Subcategorization 38
Production 38
Alternate Limits 38
Mass And Concentration Limits 39
Other ELG Considerations 39
Best Professional Judgement (BPJ) 39
Best Pollutant Control Technology Currently Available (BPT) Requirements 40
Best Conventional Pollutant Control Technology (BCT) Requirements 40
Best Available Technology Economically Achievable (BAT) Requirements 40
Other BPJ Considerations 40
Secondary Treatment Requirements 41
Mechanical Plants 41
Lagoon Systems 41
Discharges To Lakes 41
Water Quality Based Requirements 41
Mixing Zone Requirements 41
Discharges to State Lakes 42
Purpose 42
Background 42
Procedure 43
Reasonable Potential Evaluation 44
Reasonable Expectation Evaluation 45
Effluent Sampling Procedures 45
composite sampling 45
grab sampling 45
sample collection, handling, and analysis 45
Effluent And Receiving Water Data Set Analysis 45
MINIMUM QUANTIFICATION LEVELS (MQLs) 46
Data Set Requirements For Calculating Summary Statistics 49
effluent data 49
receiving water (background) data 52
Effluent Characterization 52
numerical criteria for the public and private water supply use 52
raw water columnn criteria 52

CRITERIA FOR THE PROTECTION OF HUMAN HEALTH FOR THE CONSUMPTION OF FISH FLESH AND WATER 52
NUMERICAL CRITERIA FOR FISH THE FISH AND WILDLIFE PROPAGATION USE 53
ACUTE AND CHRONIC TOXICITY CRITERIA 53
TEMPERATURE CRITERIA 53
NUMERICAL CRITERIA FOR THE AGRICULTURE USE 53
NUMERICAL CRITERIA FOR THE PRIMARY BODY CONTACT RECREATION USE 54
NUMERICAL CRITERIA FOR THE AESTHETICS USE 54
NUMERICAL CRITERIA FOR THE FISH CONSUMPTION USE 54
RECEIVING WATER CHARACTERIZATION 54
NUMERICAL CRITERIA FOR THE PUBLIC AND PRIVATE WATER SUPPLIES USE 55
NUMERICAL CRITERIA FOR THE FISH AND WILDLIFE PROPAGATION USE 55
ACUTE AND CHRONIC TOXICITY CRTIERIA 55
TEMPERATURE CRITERIA 56
NUMERICAL CRITERIA FOR THE AGRICULTURE USE 56
NUMERICAL CRITERIA FOR PRIMARY BODY CONTACT RECREATION (PBCR) USE 56
NUMERICAL CRITERIA FOR THE AESTHETICS USE 57
NUMERICAL CRITERIA FOR FISH CONSUMPTION USE 57
REPORTING UNMEASURABLE DATA 57
WATER QUALITY-BASED EFFLUENT LIMITATIONS REQUIREMENTS 57
REASONABLE POTENTIAL DEMONSTRATED 57
COMPLIANCE SCHEDULES 57
WHOLE EFFLUENT TOXICITY 57
OTHER WATER QUALITY CONSIDERATIONS 58
SITE-SPECIFIC CALCULATIONS 58
SEVEN-DAY, TWO-YEAR LOW FLOW – 7Q2 58
APPROPRIATE SEASONAL TEMPERATURE 59
WATER QUALITY-BASED LIMIT DEVELOPMENT 59
TOXICS CONTROL 59
STATISTICAL PERMIT LIMIT DERIVATION 60
DYNAMIC MODEL ALLOCATIONS 60
STEADY STATE MODEL ALLOCATIONS 60
EFFLUENT VARIABILITY 60
CALCULATION OF WASTELOAD ALLOCATIONS (WLAS) AND CRITERION LONG TERM AVERAGES (LTAS) 61
CALCULATION OF WLA AND CRITERION LTA FOR ACUTE AND CHRONIC TOXICITY CRITERIA 61
WLA_A AND WLA_C FOR DISCHARGES TO STREAMS 61
ACUTE CRITERIA WLA 61
CHRONIC CRITERIA WLA 61
WLA_A AND WLA_C FOR DISCHARGES TO LAKES 62
LTA_A AND LTA_C 62
CALCULATION OF WLA AND CRITERION LTA FOR AMMONIA TOXICITY 63
WLA_{NH3} 64
LTANH3 64
CALCULATION OF WLA AND CRITERION LTA FOR HUMAN HEALTH AND RAW WATER COLUMN CRITERIA 64
WLA_{FF}, WLA_{FFW} AND WLA_{RAW} 64
LTA_{FF}, LTA_{FFW} AND LTA_{RAW} 64
CALCULATIONS OF WLA AND CRITERION LTA FOR AGRICULTURE CRITERIA 65
WLA_{YMS} AND WLA_{SS} 65
LTAYMS AND LTASS FOR AGRICULTURE CRITERIA 65
LTA_{CL}, LTA_{SO4}, AND LTA_{TDS} 65
CALCULATION OF WLA AND CRITERION LTA FOR TEMPERATURE CRITERIA 66
WLA_T FOR DISCHARGES TO STREAMS 66
WLA_T FOR DISCHARGES TO LAKES 67
LTA_T (50% PROBABILITY BASIS) 67
CALCULATION OF PERMIT LIMITS FROM CRITERION LTAS 68

Calculation of Monthly Average and Daily Maximum Limits for Acute and Chronic Toxicity Criteria 68
MAL_{TOX} 68
DML_{TOX} 68
Calculation Of Monthly Average And Daily Maximum Limits For Ammonia Toxicity 69
MAL_{NH3} 69
DML_{NH3} 69
comparison of Toxicity-Based Ammonia Limits with DO-Based and Technology-Based Limits 69
Performance-Based Monitoring Frequency Reduction for Ammonia 69
Calculating Of Monthly Average And Daily Maximum Limits For Human Health And Raw Water Column Criteria 69
MAL_{HH} (95% probability basis) 69
Calculation Of Monthly Average And Daily Maximum Limits For Agriculture Criteria 70
MAL_{CL}, MAL_{SO4}, and MAL_{TDS} 70
DML_{CL}, DML_{SO4}, and DML_{TDS} 71
Calculation Of Monthly Average, Weekly Average, And Daily Maximum Permit Limits For Temperature 71
MAL_T (95% probability basis) 71
WAL_T (95% probability basis). 72
DML_T 72
Whole Effluent Toxicity Limits 72
Water Quality-Based Effluent Monitoring Requirements 73
Biomonitoring (Whole Effluent Toxicity Testing) Requirements 73
wet testing methods 73
applicability and type of wet test required 73
critical dilutions 74
wet test dilution series 74
WET Testing Endpoint And Test Failure Criteria 76
acute tests 76
chronic tests 77
lethal effect (survival) 77
sublethal effects 77
Test Failure Notification And Retesting 77
Concurrent Chemical-Specific Sampling And Analysis 77
Toxicity Reduction Evaluations/Toxicity Identification Evaluations (TREs/TIEs) 77
WET Test Dilution Water 77
WET Testing Frequency 78
trial period 78
WET Testing Frequency Reductions 78
approval of certification 78
test failure demonstrated during the wet testing trial period 78
Pollutant-Specific Effluent Monitoring Requirements 78
Water Quality-Based Background Monitoring Requirements 79
Expressing Water Quality-Based Effluent Limitations 79
Mass-Based Effluent Limits 80
Concentration-Based Effluent Limits 80
Detection Level Limits 80
Effluent Monitoring Frequency 80
Performance-Based Monitoring Reductions 83
timing of decisions 83
entry criteria for participation 83
facility enforcement history 83
parameter-by-parameter compliance 84
parameter-by-parameter performance history 84

MASS LOADING-EQUIVALENT CONCENTRATIONS 85
RESIDENCY CRITERIA FOR CONTINUED PARTICIPATION 86
SPECIAL CONSIDERATIONS 86
DISCONTINUOUS DATA 86
INDEPENDENT/DEPENDENT CONTROL PARAMETERS 86
MONITORING FREQUENCY "FLOOR" 86
EXCEPTIONS 86
APPLICABILITY TO MINOR FACILITIES 87
LIMITS BELOW LEVELS OF DETECTION 87
USE OF DAILY MAXIMUM VALUES 87
THE TMDL PROCESS 87
THE TMDL OBJECTIVE 88
ASSESSMENT OF EXISTING CONDITIONS 88
WATER QUALITY 88
EXISTING DATA 88
DATA REQUIREMENTS 88
POLLUTANT LOAD 88
CURRENT LOADING 88
POLLUTANT SOURCE(S) ANALYSIS 88
DIFFERENTIATE POINT AND NONPOINT SOURCES 89
MAXIMUM ALLOWABLE LOADING NECESSARY TO MEET WATER QUALITY STANDARDS 89
ALLOCATION OF LOADINGS 89
ALLOCATION CONSIDERATIONS 89
FUTURE GROWTH 89
FLOW AND LOAD VARIATIONS 89
TEMPORAL VARIATIONS 89
ANTIBACKSLIDING 89
ANTIDEGRADATION 91
POLLUTANT SOURCES AND SOURCE CATEGORIES 91
POLLUTION ALLOCATION SCHEMES 91
EQUAL PERCENT REMOVAL 91
EQUAL EFFLUENT CONCENTRATION 92
HYBRID METHOD 92
OTHER METHODS 92
ALLOCATION TRADEOFFS 92
MARGIN OF SAFETY 92
LOADING CAPACITY AND ALLOCATIONS 92
LOADING CAPACITY (LC) 92
WASTELOAD ALLOCATION (WLA) 92
LOAD ALLOCATION (LA) 93
MARGIN OF SAFETY (MOS) 93
WATER-QUALITY MODELING 93
MIXING ZONES 93
STREAMS AND RIVERS 93
LAKES 93
LEVEL OF EFFORT 94
METHOD 1 – UNCALIBRATED MODEL 94
CONSERVATIVE SUBSTANCE MIXING ZONE MODEL 94
COMPLETE MIX MASS BALANCE MODEL 95
HORIZONTAL JET MODEL 95
MULTI-DISCHARGER DESKTOP DISSOLVED OXYGEN MODEL 96
OTHER MODELS 100
METHOD 2 – CALIBRATED MODEL 100
METHOD 3 – CONFIRMED 100
METHOD 4 – POST AUDIT MODEL 100
UNCERTAINTY ANALYSIS 100
INTEGRATED WATER QUALITY REPORT LISTING METHODOLOGY 101
USAP 101

BENEFICIAL USES 101
DATA REQUIREMENTS 101
SPATIAL 102
TEMPORAL 102
QUANTITY 102
PQLS 102
CRITERIA ABOVE PQL 102
CRITERIA BELOW PQL 102
MAGNITUDE OF EXCEEDANCE 103
QUALITY ASSURANCE 103
DEFAULT PROTOCOL 103
SHORT TERM AVERAGE PARAMETERS 103
LONG TERM AVERAGE PARAMETERS 104
FISH & WILDLIFE PROPAGATION (F&WP) 104
DISSOLVED OXYGEN (DO) 104
STREAMS 104
LAKES 105
SURFACE CRITERIA FOR WWAC LAKES 105
WATER COLUMN CRITERIA FOR WWAC LAKES 106
TOXICANTS 106
CHRONIC EFFECTS 107
PH 107
BIOLOGICAL DATA 107
ASSESSMENT OF F&WP BENEFICIAL USE WITH FISH COLLECTION DATA 108
TURBIDITY 112
OIL & GREASE 113
SEDIMENT 114
TOXICANTS NOT ASSESSED AND NOT LIKELY TO OCCUR OR VIOLATE CRITERIA 114
PRIMARY BODY CONTACT RECREATION (PBCR) 115
ESCHERICHIA COLI (E. COLI) 115
ENTEROCOCCI 115
SECONDARY BODY CONTACT 115
PUBLIC AND PRIVATE WATER SUPPLY (PPWS) 115
TOXICANTS 115
TOTAL COLIFORM 116
OIL & GREASE 116
PARAMETERS NOT ASSESSED AND NOT LIKELY TO OCCUR OR VIOLATE CRITERIA 117
CHLOROPHYLL-α AND PHOSPHORUS 117
EMERGENCY WATER SUPPLY (EWS) 117
AGRICULTURE 117
TDS 117
CHLORIDES 118
SULFATES 118
NAVIGATION 119
AESTHETICS 119
NUTRIENTS 119
WADABLE STREAMS 120
LAKES AND NONWADABLE STREAMS 120
PHOSPHORUS 120
OIL & GREASE 120
COLOR 120
FISH CONSUMPTION 121
CATEGORY DECISION METHODOLOGY 121
SOURCES OF NON-ATTAINMENT 133
INDUSTRIAL POINT SOURCES 136
MUNICIPAL POINT SOURCES 136
COMBINED SEWER OVERFLOWS 137
AGRICULTURAL POINT SOURCES 137

AGRICULTURE 137
SILVICULTURE 137
CONSTRUCTION 137
URBAN RUNOFF & STORM SEWERS 138
RESOURCE EXTRACTION 138
RESOURCE EXTRACTION 138
LAND DISPOSAL 138
HYDROMODIFICATION: DAMS & FLOW REGULATION 138
HYDROMODIFICATION: OTHER 138
NATURAL 139
PRIORITIZATION OF TMDL DEVELOPMENT & FUTURE MONITORING 139
FIGURE 14: ROTATING BASIN PLAN WATERSHEDS BY YEAR 141
COORDINATION, REVIEW, AND APPROVAL 141
OKLAHOMA WATERBODY IDENTIFICATION (WBID) SYSTEM 141
CONTROL OF RESIDUAL WASTE 142
PERMIT REQUIREMENTS 142
SLUDGE MANAGEMENT PLANS 142
PERMIT ISSUANCE PRIORITIES 143
CHAPTER 4 144
PLANNING AND INTERGOVERNMENTAL COOPERATION 144
INTRODUCTION 144
HISTORICAL SUMMARY 144
PUBLIC PARTICIPATION IN THE CONTINUING PLANNING PROCESS 145
GENERAL DESCRIPTION 145
REVISION AND UPDATE OF THE WATER QUALITY MANAGEMENT PLANS 145
PERMITTING PROCEDURES FOR POINT SOURCE DISCHARGE PERMITS 147
401 WATER QUALITY CERTIFICATION 147
RULEMAKING ACTIVITIES OF DEQ AND OTHER STATE AND FEDERAL AGENCIES 147
PUBLIC FORUMS FOR PUBLIC COMMENT ON ISSUES OF PUBLIC CONCERN 147
TMDLS AND THE PUBLIC PARTICIPATION PROCESS 147
WATERSHED TMDLS 147
POINT SOURCE TMDLS 148
UPDATING AND MAINTAINING THE WATER QUALITY MANAGEMENT PLAN 149
AUTHORITIES OF STATE AGENCIES AND OTHERS 149
REQUIRED CONTENTS OF PLANS 149
FORMAT OF PLANS AND INFORMATION SOURCES 151
SCHEDULES AND PROCEDURES FOR REVISION 151
COMPREHENSIVE UPDATES 151
CHANGES, ADDITIONS, OR DELETIONS TO THE WATER QUALITY MANAGEMENT PLAN UPDATE ON AN "AS-NEEDED BASIS" 152
MINOR MODIFICATIONS 152
PROCEDURES FOR MINOR UPDATES 154
PUBLIC PARTICIPATION AND STATE REVIEW OF "AS-NEEDED" MAJOR REVISIONS OF THE WATER QUALITY MANAGEMENT PLAN 154
PROCEDURES FOR MAJOR CHANGES 154
DEQ/EPA 208 MOU MODIFICATIONS FOR INDUSTRIAL DISCHARGERS 157
UPDATES AND OTHER INFORMATION SUBMITTALS 157
PROCEDURE FOR APPROVAL OF NEW DISCHARGERS 158
PROCESSES FOR INTERGOVERNMENTAL COOPERATION 159
REQUIREMENTS AND AUTHORITIES 159
COORDINATE ACTIVITIES WITH FEDERAL AGENCIES AS REQUIRED UNDER APPLICABLE FEDERAL LAWS 159
ENSURE PARTICIPATION BY ALL STATE AGENCIES WITH JURISDICTION OVER CERTAIN POINT AND NONPOINT SOURCES OF POLLUTANTS AS SET FORTH BY 27A OS SUPP., 1993, § 1-3-101 . 160
GENERAL 160
JURISDICTION AND AUTHORITIES 160
POINT SOURCE DISCHARGERS 160
NONPOINT SOURCES 160

OTHER STATUTORY AUTHORITY 160
RULES 160
METHODS OF COORDINATION 160
DISCHARGERS 160
NONPOINT SOURCES 161
IMPLEMENTATION AND ENFORCEMENT OF THE OKLAHOMA WATER QUALITY STANDARDS 161
FUNDING AND PRIORITIZATION 161
ENSURE ADEQUATE INVOLVEMENT WITH OTHER ENTITIES 162
RULEMAKING 163
COMPLAINTS AND DATA MANAGEMENT 163
OFFICES OF CITIZEN, LOCAL GOVERNMENT AND BUSINESS ASSISTANCE AND POLLUTION PREVENTION ACTIVITIES 163
WATER QUANTITY/WATER QUALITY 163
NATURAL RESOURCE DAMAGES 163
COORDINATE PLANNING EFFORTS WITH OTHER STATES, INTERSTATE COMPACT COMMISSIONS, AND REGIONAL ENTITIES 164
LOCAL GOVERNMENT COORDINATION 164
REGIONAL PLANNING AGENCIES 164
INTERSTATE COORDINATION 165
KANSAS-OKLAHOMA ARKANSAS RIVER BASIN COMPACT 165
ARKANSAS-OKLAHOMA ARKANSAS RIVER BASIN COMPACT 165
RED RIVER COMPACT 166
CANADIAN RIVER COMPACT 166
PROCEDURES FOR ISSUING FISH CONSUMPTION ADVISORIES 166
TOXICS AND RESERVOIRS PROGRAM 167
GOALS 167
SAMPLE COLLECTION METHODS 167
SPECIES SELECTION 168
SAMPLE ANALYSIS 169
DATA ANALYSIS 169
SAMPLE FREQUENCY 169
CONSUMPTION ADVISORIES 170
APPENDIX A: SAMPLE 208 FOR INDUSTRY 172
APPENDIX B: SAMPLE 208 FOR MUNICIPALITIES 173
APPENDIX C: SAMPLE 208 FACTSHEET FOR TMDLS 174
APPENDIX D: SRF DRAFT PROJECT PRIORITY LIST 176
APPENDIX E: SRF REQUIREMENTS 177

LIST OF FIGURES

FIGURE 1: MIXING ZONE AND ZONE OF PASSAGE FOR A RIVER BANK OUTFALL POINT SOURCE DISCHARGE 42

FIGURE 2: AQUATIC TOXICITY LTA FACTORS VS. EFFLUENT COEFFICIENT OF VARIATION 63

FIGURE 3: AGRICULTURE CRITERIA LTA FACTORS VS. EFFLUENT COEFFICIENT OF VARIATION 66

FIGURE 4: TEMPERATURE LTA FACTOR VS. EFFLUENT COEFFICIENT OF VARIATION 67

FIGURE 5: TOXICITY-BASED MAL AND DML PERMIT LIMIT FACTORS VS. PER MONTH MONITORING FREQ N_M 68

FIGURE 6: HUMAN HEALTH-BASED MAL AND DML PERMIT FACTORS VS. PER MONTH MONITORING FREQ N_M 70

FIGURE 7: AGRICULTURE MAL AND DML PERMIT LIMIT FACTORS VS. PER MONTH MONITORING FREQ N_M 71

FIGURE 8: TEMPERATURE MAL AND WAL PERMIT LIMIT FACTORS VS. PER WEEK MONITORING FREQ N_W 72

FIGURE 9: $(BT/C)_{MAX}$ THRESHOLD FOR BACKGROUND MONITORING 79

FIGURE 10: ANTIBACKSLIDING FLOWCHART 92

FIGURE 11: MULTID OXYGEN BALANCE 97

FIGURE 12: ECOREGIONS WHERE BIOCRITERIA HAVE BEEN ESTABLISHED 112

FIGURE 13: INTEGRATED REPORT CATEGORY DECISION TREE 122

FIGURE 14: ROTATING BASIN PLAN WATERSHEDS BY YEAR 142

FIGURE 15: FLOW CHART OF MINOR CHANGES TO THE WQM PLAN 154

FIGURE 16: FLOW CHART OF MAJOR CHANGES TO THE WQM PLAN 156

LIST OF TABLES

TABLE 1: LAKE DISCHARGE LIMITATIONS 43

TABLE 2: MINIMUM QUANTIFICATION LEVELS (MQLS) 46

TABLE 3: 0.75 DILUTION SERIES FOR CRITICAL DILUTIONS FROM 10% THROUGH 75% 74

TABLE 4: 0.75 DILUTION SERIES FOR CRITICAL DILUTIONS FROM ABOVE 75% 76

TABLE 5: DISCHARGING LAGOONS 81

TABLE 6: TRICKLING FILTER PLANTS 81

TABLE 7: ACTIVATED SLUDGE FACILITIES 82

TABLE 8: AEROBIC DIGESTERS 82

TABLE 9: ANAEROBIC DIGESTERS 83

TABLE 10: PERFORMANCE BASED MONITORING FREQUENCY REDUCTIONS WITH PERMIT VIOLATIONS 85

TABLE 11: PERFORMANCE BASED MONITORING FREQUENCY REDUCTIONS WITHOUT PERMIT VIOLATIONS 85

TABLE 12: MODELING EFFORT/TMDL SAFETY FACTOR 93

TABLE 13: TEMPERATURE AND pH-DEPENDENT SCREENING VALUES FOR AMMONIA 107

TABLE 14: MATRIX TO DETERMINE METRIC SCORES FOR EACH SAMPLE OF FISH 108

TABLE 15: BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON FISH COLLECTIONS 109

TABLE 16: FINAL FWP USE ASSESSMENT BASED UPON FISH COLLECTIONS 109

TABLE 17: MATRIX TO DETERMINE METRIC SCORES FOR EACH SAMPLE OF MACROINVERTEBRATES 110

TABLE 18: BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON MACROINVERTEBRATE SAMPLES 111

TABLE 19: BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON PROBABILISTIC MACROINVERTEBRATE SAMPLES 111

TABLE 20: FINAL FWP USE ATTAINMENT DETERMINATION BASED UPON MACROINVERTEBRATES 111

TABLE 21: DECISION MATRIX FOR TOXICANTS NOT ASSESSED OR LIKELY TO OCCUR OR VIOLATE F&WP CRITERIA 115

TABLE 22: CAUSES OF NON-ATTAINMENT 123

TABLE 23: GUIDANCE ON DETERMINING SOURCES OF IMPAIRMENT 134

TABLE 24: USEFUL INFORMATION IN DETERMINING SOURCES OF BENEFICIAL USE NON-ATTAINMENT 136

TABLE 25: TMDL PRIORITIZATION-POINT RANKING 141

TABLE 26: RESERVOIRS ROUTINELY SAMPLED 168

TABLE 27: PREFERRED FISH AND OTHER ACCEPTABLE SPECIES 168

TABLE 28: INFORMATION TO BE INCLUDED IN THE SELS LIMS 169

TABLE 29: SCREENING VALUES TO IDENTIFY POTENTIAL CONCERN 169

TABLE 30: CONTAMINANT LEVELS AT WHICH CONSUMPTION ADVISORIES WILL BE ISSUED 170

CHAPTER 1

INTRODUCTION AND OVERVIEW

The Continuing Planning Process (CPP) is required by the Clean Water Act (CWA) § 303(e)(3)(A)-(H) and 40 CFR § 130.5. The document describes the water quality programs implemented within the State. The document also describes present and planned water quality management programs and the strategy to be used by the State in conducting these programs.

PRIMARY AGENCIES

Corp. Comm.	Oklahoma Corporation Commission
OCC	Oklahoma Conservation Commission
DEQ	Oklahoma Department of Environmental Quality
ODM	Oklahoma Department of Mines
ODWC	Oklahoma Department of Wildlife Conservation
ODAFF	Oklahoma Department of Agriculture, Food and Forestry
OSE	Office of the Secretary of Environment
OWRB	Oklahoma Water Resources Board

OTHER AGENCIES

ACOG	*Association of Central Oklahoma Governments* One of the regional planning agencies designated by the Governor to provide planning for the State under the CWA.
AG	*Attorney General* The Attorney General's Office provides legal counsel and representation for Oklahoma's State agencies.
ODOC	*Oklahoma Department of Commerce* This agency is responsible for conducting population projections used in the Water Quality Management Plan.
EPA	*Environmental Protection Agency* The primary federal agency responsible for administering various environmental programs. It is responsible for restoring and maintaining the physical, chemical, and biological integrity of the nation's environment.
INCOG	*Indian Nations Council of Governments* One of the designated regional planning agencies in Oklahoma. This agency is designated by the Governor to provide planning for the State under the CWA.
OGS	*Oklahoma Geological Survey* A State agency under the direction of the University of Oklahoma that does research on the geological, mineral, and water resources in the State and makes the information discovered available to the public.
USGS	*United States Geological Survey* The USGS is a federal agency that works closely with State agencies to gather water quality, geological, and geohydrological data.

PROGRAMMATIC TERMS

A-95	A Congressionally-mandated review system that establishes a network of state, metropolitan and regional planning and development clearinghouse. The system provides rules and regulations governing the formulation, evaluation and review of Federal programs and projects having a significant impact on area and community development
104	*Section 104 of the CWA* This section of the CWA provides federal grants for water quality management activities and other special projects.
106	*Section 106 of the CWA* This section of the CWA provides annual grants to the states for use in controlling and abating water pollution control problems.
205	*Section 205 of the CWA* This section, 205(j), of the CWA provides federal grants for water quality management activities.
257	*Section 257 of the CWA* These rules were promulgated on September 19, 1979 and provided the first national guidance standards for sewage sludge use and disposal. These regulations set forth requirements for sludge treatment and sludge quality for the practices of land application and land filling. The State of Oklahoma rules for sludge management are modeled after the 257 requirements and are in some cases more stringent.
258	*Section 258 of the CWA* These rules were promulgated on October 9, 1991 and provide for non hazardous sludge disposal at landfills. These regulations set forth sludge quality requirements for landfills to accept and dispose of sewage sludge. Sewage sludge that is not land applied and is non-hazardous will be disposed of at landfills in Oklahoma.
301	*Section 301 of the CWA* This section of the CWA requires the achievement of EPA established effluent limitations for industrial and municipal point sources of pollution.
303	*Section 303 of the CWA* This section of the CWA requires states to review and, if necessary, revise their Water Quality Standards, at least once every three years, beginning in 1972.
303(d)	*Section 303(d) of the CWA* This section requires states to identify waters that do not or are not expected to meet applicable Water Quality Standards with technology-based controls alone. States are required to establish a priority ranking for the waters, taking into account the pollution severity and designated uses of the waters. Once identification and priority ranking are completed, states are to develop Total Maximum Daily Loads at a level necessary to achieve the applicable State Water Quality Standards.
303(e)	*Section 303(e) of the CWA* This section requires each state to prepare a Continuing Planning Process document.
304(l)	*Section 304(l) of the CWA* This section was enacted as part of the Water Quality Act of 1987 and requires the identification of those waters that fail to meet Water Quality Standards due to toxic pollutants and other sources of toxicity. It also requires the preparation of individual control strategies that will reduce point source discharges of toxic pollutants.

305(b) *Section 305(b) of the CWA* This section of the CWA established a process for preparing and submitting the Water Quality Assessment Report biennially. This process was established as a means for the U.S. Environmental Protection Agency and the U.S. Congress to determine the status of the Nation's waters.

314 *Section 314 of the CWA* This section of the CWA established the Clean Lakes Program for the states. Section 314 provides federal funds for the State to submit a classification of lakes according to eutrophic condition, develop processes and methods to control sources of pollution and to work with other agencies in restoring the quality of these lakes.

319 *Section 319 of the CWA* This section requires the development of a State Assessment Report and a Management Program for Nonpoint Source (NPS) pollution problems. The Assessment Report is to describe the nature, extent, and effects of NPS pollution, the causes and sources of such pollution, and programs and methods used for controlling this pollution. The Management Program explains what the State intends to accomplish in the next four fiscal years to address NPS problems.

401 *Section 401 of the CWA* This section of the CWA requires any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, to provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate.

402 *Section 402 of the CWA* This section of the CWA established the National Pollutant Discharge Elimination System (NPDES).

404 *Section 404 of the CWA* This section of the CWA is intended to control discharges of dredge or fill materials. Section 404 required permits to be issued for discharging dredged or fill materials into navigable water at specific disposal sites. This process is currently administered by the U.S. Army Corps of Engineers in conjunction with DEQ.

503 *Section 503 of the CWA* These rules were promulgated on February 19, 1993 and provide for disposal and reuse of sewage sludge that does not exceed the ceiling concentration as expressed in table 1 of the rule. The rule also requires that sewage sludge, based upon its proposed use be treated for pathogen and vector attraction reduction. Land application, incineration, and surface disposal practices are the required disposal alternatives. Domestic septage requirements are addressed in the rule in addition to the sludge requirements. Oklahoma rules for both sewage sludge and septage that meet the 503 requirements have been presented for approval.

604 *Section 604(b) of the CWA* Water quality management planning program. This section contains a provision that 40% of the total available funds be designated to regional public comprehensive planning organizations. These comprehensive planning organizations are designated by the Governor to receive funds under the 604(b) program. INCOG and ACOG are designated as comprehensive planning organizations. The designation of a comprehensive planning organization is at the discretion of the Governor.

7Q2 *Seven Day, two-year low flow* The design flow for determining allowable discharge load to a stream. The flow is calculated as a moving average of seven consecutive days for each year in a given record. These seven-day low flow values are ranked in ascending order. An order number (m) is calculated based upon the number of years of record (n), with a recurrence interval (R) of two years, as m=(n+1)/R, where R=two years. A value of flow corresponding to the m^{th} order is taken as the seven-day, two-year low flow for those historical data.

ACRONYMS AND DEFINITIONS

acute WET testing (LC50) WET testing, which measures short-term lethality to a test species over a 48-hour period.

allotment State Revolving Funds that are available for obligation. Allotments are made on a formula or other basis, which Congress specifies for each fiscal year.

alternative technology Proven wastewater treatment processes and techniques which provide for the reclaiming and reuse of water, productively recycle wastewater constituents or otherwise eliminate the discharge of pollutants, or recover energy. Specifically, alternative technology includes land application of effluent and sludge; aquifer recharge; aquaculture; direct reuse (non-potable); horticulture; revegetation of disturbed land; containment ponds; sludge composting and drying prior to land application; self-sustaining incineration; methane recovery; individual and on-site systems; and small diameter pressure and vacuum sewers and small diameter gravity sewers carrying partially or fully treated wastewater.

APA *Administrative Procedures Act*

applicant Any municipality, as defined for the State Revolving Fund, that submits a preapplication/application for financial assistance in accordance with these rules and regulations.

appropriation Statutory authority that allows federal agencies to incur obligations and to make payments out of the Treasury for specific purposes.

architectural or engineering services Consultation, investigations, reports, or services for design-type projects within the scope of the practice of architecture or professional engineering.

assimilative capacity The greatest amount of loading a waterbody can receive and still maintain the water quality standards designated for that waterbody.

AST *Advanced Secondary Treatment* Essentially the same as AWT.

authorization Legislation which authorizes the appropriation of funds to implement program activities. It does not provide any money, only the appropriation act itself permits the withdrawal of funds from the Treasury.

AWT or AT *Advanced Wastewater Treatment* Treatment of wastewater effluent at a higher level than secondary. This process usually involves the addition or removal of chemical components during treatment.

BAT	*Best Available Technology* Economically Achievable. A term derived from Section 301 of the CWA in which effluent limitations for categories and classes of point source, other than publicly owned treatment works, shall require application of the best available technology economically achievable for such category or class. BAT effluent limitations guidelines, in general, represent the best existing performance in the category or subcategory for control of non-conventional and toxic pollutants.
BCT	*Best Conventional Pollutant Control Technology*. A term derived from Section 301 of the CWA in which effluent limitations for categories and classes of point source, other than publicly owned treatment works, shall require application of the best conventional pollutant control technology for such category or class. BCT effluent limitations guidelines, in general, represent the best existing performance in the category or subcategory for control of conventional pollutants. BCT is not an additional limitation but replaces BAT for the control of conventional pollutants.
BPT	*Best Pollutant Control Technology* Currently Available. A term derived from Section 301 of the CWA in which effluent limitations for categories and classes of point source, other than publicly owned treatment works, shall require application of the best pollutant control technology currently available for such category or class. BPT effluent limitations guidelines are generally based on the average of the best existing performance by plants of various sizes, ages and unit processes within the category or subcategory for the control of familiar pollutants (i.e., conventional pollutants and some metals).
binding commitment	Legal obligations by the State to the local recipient that define the terms and the timing for assistance under the State Revolving Fund.
BMP	*Best Management Practice* A technique that is determined to be the most effective, practical means of preventing or reducing pollutants from Nonpoint sources in order to achieve water quality goals.
BOD5	*Biochemical Oxygen Demand* The BOD5 of a water is an amount of oxygen required by microorganisms while stabilizing decomposable organic matter under aerobic conditions. The test is important in the evaluation of purification capacity of a stream or other body of water. The test requires five days of laboratory time and results may vary when toxic substances are present which affect bacteria.
BPWTT	*Best Practical Waste Treatment Technology* A term derived from Section 201 of the CWA in which waste treatment management plans and practices shall provide for the application of the best practical waste treatment technology before any discharge into receiving waters.
building	The erection, acquisition, alteration, remodeling, improvement or extension of treatment works.
CAA	*Clean Air Act* Public Law 95-396, this includes 1970 amendments to the Clean Air Acts of 1963-67 which authorizes the setting of tough, uniform national ambient air quality standards to safeguard public health and welfare and upgrade the quality of American life.
capitalization grant	An agreement between EPA and the states whereby federal dollars are made available to partially fund a State Revolving Fund (SRF).

CBOD5	*Carbonaceous Biochemical Oxygen Demand* That portion of the BOD that is not due to oxidation of nitrogenous compounds.
CFR	*Code of Federal Regulations* A codification of the general and permanent rules published in the Federal Register by the Executive Departments and agencies of the Federal Government.
chronic WET testing	WET testing, which measures long term lethal and sublethal effects to specific aquatic animal test species over a 7 day period.
COD	*Chemical Oxygen Demand* The COD test is used extensively in the measurement of pollution strength of domestic and industrial wastes. The COD test measures the total amount of oxygen needed to completely oxidize the waste to carbon dioxide and water. The test employs a strong oxidizing agent to oxidize all organic compounds present in the waste. The test is more reliable than the BOD test and can be completed in about three hours.
collector sewer	The common lateral sewers, within a publicly owned treatment system which are primarily installed to receive wastewater directly from facilities which convey wastewater from individual systems, or from private property, and which include service "Y" connections designed for connection with those facilities including: Crossover sewers connecting more than one property on one side of a major street, road, or highway to a lateral sewer on the other side when more cost effective than parallel sewers; and Pumping units and pressurized lines serving individual structures or groups of structures when such units are cost effective and are owned and maintained by the recipient.
combined sewer	A sewer that is designed as a sanitary sewer and a storm sewer.
construction	Any one or more of the following: preliminary planning to determine the feasibility of treatment works, engineering, architectural, legal, fiscal, or economic investigations or studies, surveys, designs, plans, working drawings, specifications, procedures, or other necessary actions, erection, building, acquisition, alteration, remodeling, improvement, or extension of treatment works, or the inspection or supervision of any of the foregoing items.
contingency section	The planning portion of the priority list consisting of projects which may receive loans due to bypass provision or due to additional funds becoming available.
CPP	*Continuing Planning Process* A document which describes present and planned water quality management programs and the strategy to be used by the State in conducting these programs.
critical dilution	An effluent dilution, expressed as a percentage, representative of the dilution afforded a wastewater discharge according to the appropriate Q*-dependent chronic mixing zone equation for chronic WET testing. The critical dilution for acute WET testing is 100%.
critical effluent flow	The point source effluent waste flow used in water quality modeling of a pollutant.
cross-cutting laws and orders	Federal laws and authorities that apply to all activities supported with funds "directly made available by" capitalization grants.
cfs	cubic foot per second.

CWA or "the Act"	*Clean Water Act* Public Law 92-500 enacted in 1972 provides for a comprehensive program of water pollution control. Two goals are proclaimed in this Act: 1) to achieve swimmable, fishable waters wherever attainable by July 1, 1983, and 2) by 1985 eliminate the discharge of pollutants into navigable waters.
daily discharge	The discharge of a loading measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.
dilution series	A set of proportional effluent dilutions for acute or chronic WET testing based on a specified critical dilution, which is typically the next-to-highest dilution in the series.
DO	*Dissolved Oxygen* DO concentrations range from a few parts per million up to about 10 ppm for most Oklahoma streams. A level of DO around 7 ppm is essential to sustain desired species of game fish. If DO drops below 5 ppm the danger of a fish kill is present and malodorous conditions will result. The major factors determining DO levels in water are temperature, atmospheric pressure, plant photosynthesis, rate of aeration and the presence of oxygen demanding substances such as organic wastes. In addition to its effect on aquatic life, DO also prevents the chemical reduction and subsequent movement of iron and manganese from the sediments and thereby reduces the cost of water treatment.
DO target	*Dissolved Oxygen Target* The dissolved oxygen concentration to be met using a particular water quality model so to meet a DO criterion corresponding to the maintenance of a beneficial use.
dynamic (unsteady-state) simulation	Conditions at one or more points in a system being modeled change with time. Dynamic simulations approximate the response of a system to time-variable changes in the loads entering the system.
EIS	*Environmental Impact Statement* A mandatory statement process required for federal agencies. An EIS is required before a federal agency reaches a decision on a proposed major action, which may significantly affect the environment. The statement must analyze in detail the likely environmental consequences of action and make the analysis available to the public.
enforceable requirements of the Act	Those conditions or limitations of NPDES permits which, if violated, could result in the issuance of a compliance order or initiation of a civil or criminal action. If a permit has not been issued, the term shall include any requirement, which would be included in the permit when issued. Where no permit applies, the term shall include any requirement which is necessary to meet applicable criteria for best practicable wastewater treatment technology (BPWTT).
equivalency projects	Projects, cited by the Board as being funded up to an amount equivalent to the capitalization grant and which meet the sixteen specific Title II requirements.
excessive infiltration/inflow	The quantities of infiltration/inflow which can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the infiltration/inflow conditions to the total costs for transportation and treatment of the infiltration/inflow.

FIFRA	*Federal Insecticide, Fungicide and Rodenticide Act* Public Law 94-140 which provides for broad government pre-market clearance and control of pesticides to ensure that they do not pose unreasonable adverse effects on humans or the environment.
fundable portion	That portion of the Project Priority List which includes projects scheduled for financial assistance during the funding year.
funding year	The first year of the planning period represented by a project priority list.
FY	*Fiscal Year* A twelve month period for which budgetary appropriations are allocated. The fiscal year for the Federal Government begins October 1 and ends on September 30. The State of Oklahoma's fiscal year begins July 1 and ends June 30.
geometric mean	The antilog of the mean of a set of log-transformed data. For the purposes of performing a reasonable potential evaluation in those cases where only one data value is available that single effluent data value will be considered the geometric mean.
harmonic mean	The reciprocal of the mean of the reciprocals of a set of data.
HQW	*High Quality Waters* Waterbodies that are prohibited from having any point source discharge(s) or alteration of any existing point source discharge(s) which would result in an increase in the concentration or an increase of pollutant loading of any constituent in the receiving water. The water quality exceeds that necessary to support propagation of fishes, shellfishes, wildlife, and recreation as described in Rule 200.3, Anti-Degradation Policy Statement.
HSWA	*Hazardous and Solid Waste Amendments* The 1984 Act (Public Law 98-616) that significantly expanded both the scope and coverage of RCRA.
I/A	*Innovative and Alternative* Innovative technology deals with wastewater treatment processes and techniques that are being developed which have not been fully proven to reclaim and reuse water. Alternative technology deals with proven wastewater treatment processes and techniques, which provide for the reclaiming and reuse of water.
infiltration	Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include and is distinguished from inflow.
inflow	Water other than wastewater that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include and is distinguished from infiltration.
initiation of operation	The date specified by the recipient on which use of the project begins for the purposes that it was planned, designed, and built.

innovative technology Developed wastewater treatment processes and techniques which have not been fully proven under the circumstances of their contemplated use and which represent a significant advancement over the state of the art in terms of significant reduction in life cycle cost or significant environmental benefits through the reclaiming and reuse of water, otherwise eliminating the discharge of pollutants, utilizing recycling techniques such as land treatment, more efficient use of energy and resources, improved or new methods of waste treatment management for combined municipal and industrial systems, or the confined disposal of pollutants so that they will not migrate to cause water or other environmental pollution.

Intended Use Plan A document prepared each year by the State, which identifies the intended uses of the funds in the SRF and describes how those uses support the goals of the SRF.

interceptor sewer A sewer which is designed for one or more of the following purposes:

- To intercept wastewater from a final point in a collector sewer and convey such wastes directly to a treatment facility or another interceptor.
- To replace an existing wastewater treatment facility and transport the wastes to an adjoining collector sewer or interceptor sewer for conveyance to a treatment plant.
- To transport wastewater from one or more municipal collector sewers to another municipality or to a regional plant for treatment.
- To intercept an existing major discharge of raw or inadequately treated wastewater for transport directly to another interceptor or to a treatment plant.

intermittent lethality Two or more lethal effect test failures of a routine acute or chronic WET test within any 18-month period.

LA *Load Allocation* The portion of a receiving water's loading capacity that is attributed either to one of its existing or future Nonpoint sources of pollution or to natural background sources.

LAB CERT *Laboratory Certification* DEQ program which sets out the rules and regulations for the laboratory certification program. Its objective is to establish uniform methods of water and wastewater analysis.

LC *Lethal Concentration* The concentration of certain chemicals or substances that can have lethal effects on living things.

LC_{50} The concentration of a toxicant in an external medium that is lethal to fifty percent of the test animals for a specified period of exposure.

load or loading The amount of matter or thermal energy that is introduced into a receiving water. A load may be caused by man (a pollutant) or by nature (natural background load). For oxygen demanding material, load may be expressed separately for separate components (e.g. CBOD, NBOD), or may be expressed as a total oxygen demand.

loan An agreement between the State and the local recipient through which the SRF provides funds for eligible assistance and the recipient promises to repay the principal sum to the SRF over a period not to exceed 20 years at an interest rate established at or below market rates (may be interest free).

long-term average flow An arithmetic average stream flow over a representative period of record.

maintenance Preservation of functional integrity and efficiency of equipment and structures. This includes preventive or corrective maintenance and replacement of equipment.

maximum likelihood estimator For the purposes of performing reasonable potential evaluations the maximum likelihood estimator for a particular upper percentile is calculated assuming the population of values fit a log-normal distribution with a coefficient of variation of 0.6. This can be described as:

Where:

$$C_p = C_{mean} * \exp\left(Z_p * \sigma - 0.5 * \ln\left(CV^2 + 1\right)\right) \quad (1)$$

Z_p = normal distribution factor at p^{th} percentile

C_{mean} = geometric mean

For the 95th percentile the maximum likelihood estimator is typically calculated as:

$$C_{95} = 2.13 \cdot C_{mean} \quad (2)$$

If a large data set of effluent concentrations is available, C95 may not need to be estimated, the 95th percentile value can be calculated from the data.

mean annual average flow The annual mean flow found in "Statistical Summaries", USGS publication no. 87-4205, or most recent version thereof, or other annual mean flow as approved by the Oklahoma Water Resources Board or the permitting authority.

MBE/WBE participation The federal requirement for negotiation of a "fair share" objective for minority and women owned businesses (MBE/WBE) applies to assistance in an amount equal to the capitalization grant.

MGD *Million Gallons per Day* Measurement of average daily flow from municipal and industrial point sources.

MQL *Minimum Quantification Level* The lowest concentration at which a particular substance can be quantitatively measured with a defined precision level, using approved analytical methods.

mixing zone

When a liquid of a different quality than the receiving water is discharged into the receiving water, a mixing zone is formed. Concentration of the liquid within the mixing zone decreases until it is completely mixed with the receiving water. In Oklahoma, the regulatory mixing zone is described as follows:

In streams, the mixing zone extends downstream a distance equivalent to thirteen (13) times the width of the water within the receiving stream at the point of effluent discharge and encompasses 25% of the total stream flow of the 7Q2 or 1 cfs, whichever is larger, immediately downstream of the point of effluent discharge. Acute toxicity within the mixing zone is prohibited. The water quality in a portion of the mixing zone may be unsuitable for certain beneficial uses. Where overlapping mixing zones occur because of multiple outfalls, the total length of the mixing zone will extend thirteen (13) stream widths downstream from the downstream discharge point.

In lakes, the mixing zones shall be designated on a case-by-case basis. However, for permitting purposes, the mixing zone is defined to extend a radius of 100 feet from the source.

NEPA

National Environmental Policy Act The cornerstone of the environmental impact statement process. The Act requires each federal agency to issue regulations detailing the policies and procedures it will follow for the impact statement process.

NIPDWR

National Interim Primary Drinking Water Regulations EPA established the NIPDWR to provide minimum national drinking water standards for all public water.

$NOEC_L$

(No Observed Effect Concentration-Lethal) means the greatest tested effluent dilution in a WET test at and below which lethality to test organisms does not occur that is statistically different from the control (0% effluent) at the 95% confidence level.

$NOEC_S$

(No Observed Effect Concentration- Sublethal) means the greatest tested effluent dilution in a WET test at and below which a sublethal effect to test organisms does not occur that is statistically different from the control (0% effluent) at the 95% confidence level.

non-excessive infiltration

The quantity of flow which is less than 120 gallons per capita per day (domestic base flow and infiltration) or the quantity of infiltration, which cannot be economically and effectively eliminated from a sewer system as determined in a cost-effectiveness analysis.

non-excessive inflow

The rainfall induced peak inflow rate which does not result in chronic operational problems related to hydraulic overloading of the treatment works during storm events. These problems may include surcharging, backups, bypasses, and overflows.

NPDES

National Pollutant Discharge Elimination System A permit program established by Section 402 of the CWA. This program regulated discharges into the Nation's waters from point sources, including municipal, industrial, commercial and certain agricultural sources.

NPS

Nonpoint source. The contamination of the environment with a pollutant for which the specific point of origin may not be well defined and includes but is not limited to agricultural storm water runoff and return flows from irrigated agriculture.

NPS Mgmt.	*Nonpoint Source Management* Section 319 of the CWA.
NSPS	*New Source Performance Standards.* A term derived from Section 301 of the CWA in which effluent limitations for categories and classes of point source, other than publicly owned treatment works, shall require application of the new source performance standards for such category or class (applies to new industrial dischargers which are determined to be new sources). NSPS are based on the performance of the best available demonstrated control technology in the category or subcategory for all pollutants (conventional, non-conventional and toxic pollutants).
OAC	*Oklahoma Administrative Code*
OPDES	*Oklahoma Pollutant Discharge Elimination System* A permit program established by 27A O.S. 1993 Supp., § 2-6-201 et seq. (see also Section 402 of the CWA). This program regulated discharges into Oklahoma's waters from point sources, including municipal, industrial, commercial and certain agricultural sources.
operable treatment works	A treatment works that, upon completion, will meet the enforceable requirements of the Act.
operation	Control of the unit processes and equipment which make up the treatment works. This includes financial and personnel management, records, laboratory control, process control, safety and emergency operation planning.
operation and maintenance	Activities required to assure the dependable and economical function of treatment works.
ORW	*Outstanding Resources Waters* These are waters which constitute outstanding resources or are of exceptional recreational and/or ecological significance as described in Rule 200.4, Anti-Degradation Policy Statement. They are prohibited from having any new point source discharge(s) or increased load from existing point source discharge(s).
O.S.	*Oklahoma Statutes*
PCBs	*Polychlorinated Biphenyls* Compounds that are produced by replacing hydrogen atoms in biphenyl with chlorine. They are poisonous environmental pollutants.
PCS	*Permit and Compliance System* A computerized management information system for tracking permit, compliance, and enforcement status for the NPDES program under the Clean Water Act. PCS is designed to support the individual NPDES administrative needs of the states and EPA Regional offices and provides a uniform means of communication between states, regions, and EPA Headquarters.
persistent lethality	Lethal test failures in two of three consecutive monthly WET tests for either or both test species. The monthly tests are the result of lethality during a regularly scheduled WET test..
persistent sublethality	Two consecutive chronic sublethal effect test failures.
P.L.	*Public Law* Law concerned with regulating relations of individuals with the government and the organization and conduct of the government itself.

planning	The process of evaluating alternative solutions to water pollution problems, and through a systematic screening procedure, selecting the most cost effective environmentally sound alternative.
planning portion	The part of the Project Priority List containing all projects outside the fundable portion of the list that may, under anticipated allotment levels, receive funding during the five-year planning period represented by the list.
POTW	*Publicly Owned Treatment Works* A treatment facility owned and operated by a municipality, governmental organization, or Indian Tribe.
Project	The scope of work for which SRF assistance is provided. The scope of work is for construction and design, or construction of an operable treatment works or segment thereof. The project must be part of an operable treatment works. The principal purpose of both the project and the operable treatment works must be for the treatment of domestic users' discharges of the jurisdiction, community, sewer service area, region, or the district concerned.
project completion	The date operations of the treatment works are initiated or are capable of being initiated, whichever is earlier.
project performance standards	The performance and operations requirements applicable to a project including the enforceable requirements of the Act and the specifications, including the quantity of excessive infiltration and inflow proposed to be eliminated, which the project is planned and designed to meet.
Project Priority List	A continuous list of projects in order of priority for which SRF assistance is expected during a five-year planning period.
project priority points	The total number of points assigned to a project by using the priority ranking formula.
PS	*Point Source* Any discernible, confined and discrete conveyance or outlet including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock or vessel or other floating craft from which pollutants are or may be discharged into waters of the State. The term "point source" shall not include agricultural storm water runoff and return flows from irrigated agriculture.
Q*	The ratio of the regulatory effluent flow (Q_e) to the regulatory receiving water flow (Q_u).
$Q_{e(30)}$	Means the Q_e, which is the highest monthly average flow over the two year period of record for an industrial facility.
quasi-dynamic (or quasi-steady state) simulation	One or more boundary conditions is constant, but other conditions vary with time. For example, QUAL2E can be used to compute the average response of a stream to specified constant flows and loads, but the user can also specify time varying meteorological conditions to simulate the effect of variable sunlight, air temperature, and wind speed on water quality conditions.

RCRA	*Resource Conservation and Recovery Act of 1976* This Act, also known as Public Law 94-580, amended the Solid Waste Disposal Act of 1965. The Act has two main objectives: 1) to broaden the national waste management program to better protect the public health and the environment, and 2) to conserve natural resources through waste reduction, materials and energy recovery.
reallotment	Allotment of previously allotted unused funds.
recipient	A municipality or other entity which receives assistance under the SRF program.
repayment	Principal and interest payments on loans which must be credited directly to the SRF.
replacement	Expenditures for obtaining and installing equipment, accessories, or appurtenances during the useful life of the treatment works necessary to maintain the capacity and performance for which such works are designed and constructed.
responsible bidder	A prospective contractor that currently meets the minimum standards of financial and technical ability to perform the tasks identified in the project specifications.
revenue program	A formally documented determination of charges which is designed to provide revenues for operation and maintenance (including replacement), and local debt service for treatment works.
RRT	*Regional Response Team* A regional group composed of federal agencies and states within the region which are called upon in the event of an emergency.
SDWA	*Safe Drinking Water Act* Public Law 95-535 was passed in 1974 and amended in 1977. The Act mandates two major program initiatives- one aimed at ensuring the safety of the Nation's public water supplies and other designed to protect underground sources of drinking water from contamination through injection wells.
SEA	*State/Environmental Protection Agency Agreement* An agreement negotiated between EPA and the State which defines State and EPA responsibilities and funding levels. The Agreement encourages program coordination, simplified paperwork and improved program accountability.
SIC	*Standard Industrial Classification* The statistical classification standard developed by the Federal government for use in the classification of establishments by type of activity in which they are engaged. The Standard Industrial Classification covers the entire field of economic activities: agriculture, forestry, fishing, hunting and trapping; mining; construction; manufacturing; transportation, communications, electric, gas, and sanitary services; wholesale trade; retail trade; finance, insurance and real estate; personal, business, professional, repair, recreation and other services; and public administration. Under the SIC, establishments are assigned four-digit codes (SIC Codes) which identify the primary activity or activities in which they are engaged. SIC Codes can be found in the Standard Industrial Classification Manual 1987, published by the Executive Office of the President, Office of Management and Budget.

SIP	*State Implementation Plan* A plan required by Section 110 of the Clean Air Act. The plan provides for the implementation, maintenance and enforcement of primary and secondary standards of air quality, which are consistent with national standards.
SRF	*State Revolving Fund* Funds for loans or providing other assistance for pollution control projects established through capitalization grants from EPA and State matching funds.
S.S.	*State Strategy* A document prepared and updated by the State. The document is a five year strategy for controlling water pollution problems.
SS	*Suspended Solids* The solid material that originates mostly from disintegrated rocks and is suspended in water. It includes biochemical and chemical precipitates and decomposed organic material.
SSES	*Sewer System Evaluation Survey* A study which shall identify the location, estimated flow rate, method of rehabilitation, and cost of rehabilitation versus the cost of transportation and treatment for each defined source of infiltration/inflow.
state match	Funds equaling at least 20% of the amount of the capitalization grant which the State must deposit into the SRF.
statutory requirements	The sixteen specific Title II requirements which are attached to Section 212 publicly-owned treatment works funded up to an amount equivalent to the capitalization grant.
steady-state simulation	Conditions at all points in a system being modeled are constant with time. Steady-state simulations use averaged loads and flows entering the system over specified periods of time to compute the average response in the system.
STORET	*Storage and Retrieval System* An EPA computerized management information system which allows the user to store and retrieve water quality information.
storm sewer	A sewer designed to carry only storm waters, surface runoff, street wash waters, and drainage.
STP	*Secondary Treatment Plant* A sewage treatment facility which utilizes oxidative activity of organisms to stabilize the organic components of sewage.
SWS	*Sensitive Public and Private Water Supplies* Waterbodies designated with this limitation are prohibited from having any new point source discharge(s) or increased load from existing point source discharge(s). These are waters, which constitute sensitive public and private water supplies.
TMDL	*Total Maximum Daily Load* The sum of individual wasteload allocations (WLA) for point sources, safety, reserves; and loads from Nonpoint source and natural backgrounds.
TOC	*Total Organic Carbon* Measure of the organic matter contained in a sample based upon the amount of carbon it contains as measured by the complete oxidation of the matter to carbon dioxide.

transfer of reserves	The optional transfer of specific set-asides from a State's Title II allotment into an established SRF.
treatment works	Any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or sewage from other non-incorporated areas and contract facilities, including intercepting sewers, outfall sewers, sewage collection systems, pumping, power, and other equipment, and their appurtenances. In addition "treatment works" means any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, including waste in combined storm water and sanitary sewer systems.
TSCA	*Toxic Substance Control Act* Public Law 94-469 which authorizes EPA to obtain data from industry on selected chemical substances and mixtures and to regulate the substances when needed.
TSS	*Total Suspended Solids* The complete amount of solid matter suspended in water or wastewater.
TXC LST	*Toxics List* Section 304(l) of the CWA.
UIC	*Underground Injection Control* A program under the Safe Drinking Water Act intended to regulate injection activities to prevent contamination of underground sources of drinking water.
USDA	*United States Department of Agriculture* The federal agency that provides assistance to agricultural and silviculture industries. The USDA ensures that fertilizers necessary for agricultural production are available and makes certain the fertilizers do not harm the environment.
user charge	A charge levied on users of a treatment works for the proportionate share of the cost of operation and maintenance (including replacement) of such works.
Value Engineering	A cost analysis technique which uses a systematic and creative approach to identify and to focus on areas of high costs in project planning in order to maximize the cost/benefit ratio while meeting the project objectives without sacrificing the reliability or efficiency of the project.
WLA	*Wasteload Allocation* A wasteload allocation for a river segment is the assignment of target loads to point sources so as to achieve Water Quality Standards in the most efficient manner (CWA 303(e) Guidelines). The wasteload allocation is designed to allocate or allow certain quantities, rates or concentration of pollutants discharged from contributing point sources, which empty their effluent into the same river segment. The purpose of the wasteload allocation is to eliminate an undue "wasteload burden" on a given stream segment.
WLE	*Wasteload Evaluation* A more detailed assessment and estimation of pollutant loading to waterbodies than the WLA generally with a larger scope of modeling and more narrative of the analysis and application of the results; the prediction of resultant pollutant concentrations, and subsequent determination and allocation of the TMDL among the different pollutant sources in such a manner that water quality standards are maintained.
WQM	*Water Quality Management* A term associated with the various state programs found under the CWA. The various program elements under the CWA form the State and Area Water Quality Management Plans.

WQS	*Water Quality Standards* (Oklahoma WQS can be found in OAC Title 785, Chapter 45) serve as goals for the water quality management plans (Section 208) and as benchmark criteria for the NPDES (Section 402) permit process. State Water Quality Standards at a minimum consist of beneficial use classification for navigable water, water quality criteria to support those uses and a statement of policy which prevents the degradation of waters.
WQD	*Water Quality Division* The section of DEQ which regulates the discharge of non-industrial waste from any sewer system and waste from any industrial system into any water of the State and handles permitting of changes made to public water supplies and industrial and municipal permitted discharges.
zone of impact	The portion of a stream between the most upstream pollutant source and a downstream limit located by the point at which water quality has recovered to the background quality at a point immediately upstream of the most upstream pollutant source.
zone of passage	A three-dimensional zone expressed as a volume in the receiving stream through which mobile aquatic organisms may traverse the stream past a discharge without being affected by it. In Oklahoma, the regulatory zone of passage is described as follows: A zone of passage shall be maintained within the stream at the outfall and adjacent to the mixing zone that shall be no less than seventy-five percent (75%) of the volume of flow. Water quality standards shall be maintained throughout the zone of passage. Zones of passage in lakes shall be designated on a case-by-case basis.

CHAPTER 2

PART I: WATER QUALITY STANDARDS

INTRODUCTION AND PURPOSE

40 CFR (Code of Federal Regulations) § 131.2 states " A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (the Act). ``Serve the purposes of the Act'' (as defined in sections 101(a)(**2**) and 303(c) of the Act) means that water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation. Such standards serve the dual purposes of establishing the water quality goals for a specific water body and serve as the regulatory basis for the establishment of water-quality-based treatment controls and strategies beyond the technology-based levels of treatment required by sections 301(b) and 306 of the Act."

Water Quality Standards (WQS) are applicable to all waters of the State and are designed to enhance the quality of waters, to protect their beneficial uses, and to aid in the prevention, control and abatement of water pollution in the State of Oklahoma. For standards to be enforceable, adoption by the Oklahoma Water Resources Board pursuant to the State's Administrative Procedures Act (APA) is required. For the standards to be utilized in water pollution control programs, the standards must be implemented into discharge permits.

The most recent EPA approved Oklahoma Water Quality Standards may be found at:
http://www.owrb.ok.gov/util/rules/pdf_rul/RulesCurrent2011/Ch45-Current2011.pdf

Section 303 of the Clean Water Act requires each state to develop and prepare WQS. In addition, at least once every three years, each state is required to review and evaluate existing standards and determine if the current standards are appropriate or if modifications are needed.

WATER QUALITY STANDARDS AUTHORITY

STATE AUTHORITY

40 CFR § 131.4 states, "States . . . are responsible for reviewing, establishing, and revising water quality standards. As recognized by section 510 of the Clean Water Act, States may develop water quality standards more stringent than required by this regulation. "

Oklahoma law at Title 82 O.S. §1085.2 empowers the Oklahoma Water Resources Board (OWRB) to "adopt, modify or repeal and promulgate standards of quality of the waters of the State, and to classify such waters according to their best uses in the interest of the public under such conditions as the OWRB may prescribe for the prevention, control and abatement of pollution. The standard of quality of water of the State adopted by the Board pursuant to the provisions of Title 82 O.S. §1085.30 of the act shall be utilized by all appropriate State environmental agencies in implementing their respective duties to abate and prevent pollution to the waters of the State."

Section 321 (C) further states "The standards of quality of the waters of the State, implementation documents and classification of such waters or any modification or change thereof shall be adopted and otherwise comply with the APA and shall be enforced by all State agencies within the scope of their jurisdiction."

FEDERAL AUTHORITY

40 CFR § 131.5 states " (a) Under section 303(c) of the Act, EPA is to review and to approve or disapprove State-adopted water quality standards. The review involves a determination of: (1) Whether the State has adopted water uses which are consistent with the requirements of the Clean Water Act; (2) Whether the State has adopted criteria that protect the designated water uses; (3) Whether the State has

followed its legal procedures for revising or adopting standards; (4) Whether the State standards which do not include the uses specified in section 101(a)(2) of the Act are based upon appropriate technical and scientific data and analyses, and (**5**) Whether the State submission meets the requirements included in Sec. 131.6 of this part . . . (b) If EPA determines that the State's or Tribe's water quality standards are consistent with the factors listed in paragraphs (a)(1) through (a)(**5**) of this section, EPA approves the standards. EPA must disapprove the State's or Tribe's water quality standards and promulgate Federal standards under section 303(c)(4), . . . if State or Tribal adopted standards are not consistent with the factors listed in paragraphs (a)(1) through (a)(**5**) of this section. EPA may also promulgate a new or revised standard when necessary to meet the requirements of the Act."

WATER QUALITY STANDARDS COMPONENTS

Oklahoma's WQS are composed of three basic elements:

1. **Beneficial uses:** A classification of the waters of the State according to their best uses in the interest of the public.
2. **Criteria to protect those uses:** Numerical or narrative guides on the physical, chemical, or biological aspects, which will assure achievement of the designated use.
3. **Antidegradation Policy:** A statement of the State's position on the use of waters, which are protected at levels considered above that required for beneficial use maintenance.

Additionally, a fourth and fifth component involve special requirements set forth within the Standards document. These include:

4. **Compliance Schedules:** Establish a reasonable time for new criteria to be implemented into permits
5. **Variances:** Allow for deviations from certain criteria for various reasons

All five of these components will be discussed more thoroughly in subsequent chapters.

BENEFICIAL USES

Oklahoma law in Title 82 O.S. §1085.2 mandates that the OWRB is "To adopt, modify or repeal and promulgate standards of quality of the waters of the State and to classify such waters according to their best uses in the interest of the public under such conditions as the Board may prescribe for the prevention, control, and abatement of pollution."

Thus, State statutory language specifies that the OWRB is to designate beneficial uses and the Federal law (as manifest through the Code of Federal Regulations) establishes national guidelines for use designation.

Beneficial uses have been applied to Oklahoma streams and lakes since the initial (1968) WQS were adopted. These uses are revised periodically as more data are obtained. Oklahoma's WQS specifically list beneficial uses in Appendix A and 785:45-5 for Oklahoma waters. Uses defined in the WQS include: Public and Private Water Supply, Emergency Water Supply, Fish and Wildlife Propagation, Agriculture, Primary Body Contact Recreation, Secondary Body Contact Recreation, Navigation, Fish Consumption, and Aesthetics. Specific limitations may also apply to selected waters in order to provide them with additional protection.

Beneficial uses are assigned to Oklahoma Waters by three different methods. They are

1. Existing uses,
2. Assumed uses, and
3. Designated uses.

EXISTING USES

40 CFR § 131.3 (e) states that " Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." Generally, in Oklahoma, existing uses are evaluated through literature surveys of each water body. Ultimately, existing uses become designated uses when they are included in Appendix A of Chapter 45 (the WQS).

ASSUMED USES

Because it is not practical to determine the specific beneficial uses of all waterbodies through field surveys and list them in Appendix A, all waters of the State are assumed to be capable of certain beneficial uses. These uses vary according to their hydrological type such as stream or lake.

DESIGNATED USES

The process of designating beneficial uses generally involves a three step process which at any point may include sufficient information to designate uses. These three elements include a literature review, a "one-day" survey, and an intensive survey. A guidance document is available (TRWQ2001-1) through OWRB explaining the decisions and requirements for assignment of certain beneficial uses.

LITERATURE REVIEW

The literature review involves the review of historical chemical, physical and biological data. Although information of this type may be available, it is seldom comprehensive enough to allow the designation of a beneficial use. Consequently, most Use Attainability Analysis (UAAs) in Oklahoma, including the unlisted streams surveys, utilize a minimum of "one-day" surveys.

ONE-DAY SURVEYS

One-day UAAs utilize abbreviated field and laboratory analysis to designate uses. Generally, one-day surveys are sufficient to designate beneficial uses. In those rare instances when a one-day survey is inadequate to assign uses, a more intensive study may be required.

INTENSIVE SURVEY USE ATTAINABILITY ANALYSIS

In rare instances, it is not possible to designate uses to a waterbody based upon a one-day survey. In these instances, a more intensive survey is required.

These intensive studies generally involve more exhaustive chemical, physical and biological analysis. Continuous recording of physico-chemical parameters, and the deployment of periphytometers and benthic macroinvertebrate substrates are commonplace. Because of the time and manpower commitment required to perform intensive studies, they are undertaken only when one-day studies do not provide use designations or when a more detailed analyses is required to re-evaluate a stream, which had previously received a UAA.

CRITERIA TO PROTECT BENEFICIAL USES

Narrative and numerical criteria found within Oklahoma's WQS are scientifically derived to protect designated beneficial uses including human health, aquatic and terrestrial life, aesthetics, etc. These criteria also incorporate public policy through the public participation process. EPA also publishes guidance documents designed to facilitate the best available science into useful criteria.

In general, EPA guidance is helpful, but theoretical and broad based. Because it is developed from a national perspective, it is often of limited value in Oklahoma. Numerous items unique to Oklahoma water quality management (7Q2, the 1 cfs minimum low flow, beneficial uses, etc.) require that criteria (and methods to implement these criteria into permits) be developed uniquely.

GENERAL NARRATIVE CRITERIA

Oklahoma's WQS contain general narrative criteria that apply to all beneficial uses for the following parameters:

Minerals – Increased mineralization shall not impair any beneficial use.

Solids (suspended and/or settleable) – Surface waters of the State shall be maintained so as to be essentially free of floating debris, bottom deposits, scum, foam and other materials, including suspended substances of a persistent nature, from other than natural sources.

Taste and odor – Taste and odor producing substances from other than natural origin shall not impair any beneficial use.

Nutrients – Nutrients from point source discharges or other sources shall not cause excessive growth of periphyton, phytoplankton, or aquatic macrophyte communities which impairs any existing or designated beneficial use.

PUBLIC AND PRIVATE WATER SUPPLY

The various criteria to protect the Public and Private Water Supply beneficial use include:

- Raw water numerical criteria, most based upon drinking water MCLs
- Radioactive materials numerical criteria
- Maximum and geometric mean total coliform limits
- Oil and grease limits
- General criteria
- Water column numerical criteria to protect human health for the consumption of fish flesh and water

Please refer to OAC 785:45-5-10 for statutory language regarding the Public and Private Water supply beneficial use. Raw water numerical criteria are located in 785:45 Appendix G Table 2. Water column numerical criteria to protect human health for the consumption of fish flesh and water are also located in 785:45 Appendix G Table 2.

EMERGENCY PUBLIC AND PRIVATE WATER SUPPLIES

The following statutory language regarding Emergency Public and Private Water Supplies is found in OAC 785:45-5-11:

"(a) During emergencies, those waters designated Emergency Public and Private Water Supplies may be put to use.

(b) Each emergency will be handled on a case-by-case basis, and be thoroughly evaluated by the appropriate State agencies and/or local health authorities."

FISH AND WILDLIFE PROPAGATION

Four sub-categories of the Fish and Wildlife Propagation beneficial use have been designated: Warm Water Aquatic Community, Habitat Limited Aquatic Community, Cool Water Aquatic Community, and Trout Fishery. Certain criteria apply to all waters designated with any sub-category of Fish and Wildlife Propagation, while others are sub-category specific.

Criteria to protect the Fish and Wildlife Propagation beneficial use include:

- Dissolved oxygen for each sub-category with an associated 1.0 mg/L diurnal excursion.
- Temperature
- pH
- Oil and grease
- Biological criteria (an in-situ measure of biological community health)
- Numerical criteria for toxic substances
- Criteria which are alert and concern levels in fish tissue
- Water column numerical criteria to protect human health for the consumption of fish flesh
- Turbidity

Please refer to OAC 785:45-5-12 for statutory language regarding Fish and Wildlife Propagation beneficial use. Dissolved oxygen criteria are located at 785:45 Appendix G Table 1. Numerical criteria for toxic substances are in 785:45 Appendix G Table 2. Conversion factors for total to dissolved fractions are in 785:45Appendix G Table 3. Language regarding fish consumption, water column criteria to protect for the consumption of fish flesh, and fish tissue levels are in 785:45-5-20.

AGRICULTURE: LIVESTOCK AND IRRIGATION

The Water Quality Standards for the agriculture beneficial use are intended to maintain the surface waters of the State so that toxicity does not inhibit continued ingestion by livestock or irrigation of crops.

Criteria to protect the Agriculture beneficial use include:

The general narrative criteria from **785:45-5-9** requiring that increased mineralization "shall not impair any beneficial use", and water quality management segment number yearly mean standard and sample standard chloride, sulfate and TDS values.

Please refer to OAC 785:45-5-13 for statutory language regarding Agriculture: Livestock and Irrigation beneficial use. Statistical values of the historical data for mineral constituents of water quality are found in 785:45 Appendix F.

PRIMARY BODY CONTACT RECREATION

Primary Body Contact Recreation involves direct body contact with the water where a possibility of ingestion exists. The Water Quality Standards for Primary Body Contact Recreation are intended to protect the water from containing chemical, physical, or biological substances in concentrations that are irritating to skin or sense organs or are toxic or cause illness upon ingestion by human beings.

Criteria to protect the Primary Body Contact Recreation beneficial use include bacteriological criteria that apply only during the recreation period of May 1 to September 30. During the remainder of the year, the criteria for Secondary Body Contact Recreation apply.

Please refer to OAC 785:45-5-16 for statutory language regarding Primary Body Contact Recreation beneficial use.

SECONDARY BODY CONTACT RECREATION

The Secondary Body Contact Recreation beneficial use is designated where ingestion of water is not anticipated, but activities such as boating, fishing, or wading may occur.

The Water Quality Standards for Secondary Body Contact Recreation have no numerical criteria, but have narrative language stating that these waters shall be "free from human pathogens in numbers which may produce adverse health effects in humans."

Please refer to OAC 785:45-5-17 for statutory language regarding Secondary Body Contact Recreation beneficial use.

NAVIGATION

The following statutory language regarding Navigation is found in OAC 785:45-5-18.

"This beneficial use is generally more dependent upon quantity than quality of water."

FISH CONSUMPTION

The Water Quality Standards for the Fish Consumption use are intended to maintain the surface waters of the State that toxicity does not inhibit ingestion of fish and shellfish by humans.

Criteria to protect the **Fish Consumption** beneficial use include:

- Water column numerical criteria (total recoverable) identified in the "Fish Consumption" column in Table 2 of Appendix G protect human health for the consumption of fish, shellfish and aquatic life.
- Narrative criteria to prevent bio-concentration of toxic substances in fish, shellfish, or other aquatic organisms to levels that become a risk to human health

Please refer to **785:45-5-20** for statutory language regarding **Fish consumption** beneficial use.

AESTHETICS

The Aesthetics beneficial use has narrative "free from" criteria for substances such as floating materials, noxious odors and tastes, color, nutrients, solids, and others.

In addition to these narrative criteria, there is a numerical criterion for phosphorus on waters designated Scenic Rivers. The criterion states that the 30-day geometric mean total phosphorus concentration shall not exceed .037 mg/L in these waters, and that this level will be fully implemented within 10 years.

Please refer to OAC 785:45-5-19 for statutory language regarding Aesthetics beneficial use.

ANTIDEGRADATION POLICY

40 CFR §131.12 states:

"The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following: (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. (2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control. (3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. (4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act."Oklahoma's Water Quality Standards address these Antidegradation requirements in OAC 785:45-3.

SPECIAL REQUIREMENTS

Oklahoma's WQS contain supplementary information concerning numerous issues related to water quality. Foremost among them are compliance schedules, variances, endangered species protection and development of site-specific metals criteria.

COMPLIANCE SCHEDULES

Oklahoma law at Title 82 O.S. §1085.30 states: "In classifying waters and setting standards of water quality or making any modification or change thereof, the Board shall announce a reasonable time for persons discharging waste into the waters of the State to comply with such new or modified classifications or standards unless such discharges create an actual or potential hazard to public health."

Oklahoma's WQS build upon this statutory language in 785:45-5-4 (f) which states:

"Schedules for compliance with the Oklahoma Water Quality Standards may be granted to persons or facilities discharging wastes into waters of the State unless such discharge creates an actual or potential hazard to the public health in accordance with 82 O.S. §1085.30(D)."

This language allows facilities a reasonable time to make treatment modifications and/or retool in order that new WQS criteria may be met in their effluent.

VARIANCES

Oklahoma's WQS further allow that, within some stringent guidelines, a variance may be granted for selected criteria to individual discharges. "Variance" is defined in the Oklahoma WQS as "a temporary (not to exceed three years) exclusion of a specific numerical criterion for a specific discharge to a specific waterbody."

Further guidance is provided at 785:45-5-4(e).

ENDANGERED SPECIES PROTECTION

Endangered species protection is provided in OAC 785:45-5-25(c)(2) (A) and (D). OAC 785:45, Appendix B, Table 1 and Table 2 list National and State Parks, National Forests, Wildlife Areas, Wildlife Management Areas and Wildlife Refuges, and areas inhabited by federally listed threatened or endangered species pursuant to the Federal Endangered Species Act. These areas may be restricted through agreements between appropriate regulatory agencies and the United States Fish and Wildlife Services.

REQUIREMENTS FOR DEVELOPMENT OF SITE SPECIFIC CRITERIA FOR METALS

Please refer to OAC 785:45 Appendix E for statutory language regarding requirements for development of site-specific criteria for metals. A guidance document (OWRB Technical Report TRWQ2002-1) is also available at the OWRB offices and is highly recommended for those interested in pursuing development of site-specific criteria. Site specific criteria development for metals must also comply with the guidelines established in EPA-823-B-94-001 and EPA-822-R-01-005 for copper.

BIOCRITERIA

The development of biological thresholds (biocriteria) for use-support decisions has been an evolving part of the Water Quality Standards Implementation. Specific thresholds for specific ecoregions, as defined by Omernick, have been identified in OAC 785:46-15 for the purpose of making Fish and Wildlife Propagation use-support determinations.

PROCEDURES FOR REVIEW AND REVISION OF WATER QUALITY STANDARDS

MINIMUM REQUIREMENTS FOR WATER QUALITY STANDARDS SUBMISSION

40 CFR §131.6 establishes minimum requirements for submission to EPA for review. These include:

(a) Use designations consistent with the provisions of sections 101(a)(2) and 303(c)(2) of the Act.

(b) Methods used and analyses conducted to support water quality standards revisions.

(c) Water quality criteria sufficient to protect the designated uses.

(d) An antidegradation policy consistent with Sec. 131.12.

(e) Certification by the State Attorney General or other appropriate legal authority within the State that the water quality standards were duly adopted pursuant to State law.

(f) General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include the uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which may affect their application and implementation.

In general, these items are submitted to EPA in what is termed a "WQS Submittal Packet". This packet at a minimum includes:

- A copy of the revised standards which include strike-outs and underlines,
- A copy of all documentation regarding the public participation process (i.e., public notices, copies of mailing lists, comment responsiveness summaries, etc.),
- A copy of all scientific justification documents, and,
- Attorney general certification as to the satisfactory completion of the public participation process.

A more exhaustive review of the public participation requirements, including required notices, rule impact statements, comment periods, etc. is included in the following chapter.

TRIENNIAL REVISIONS

FEDERAL REQUIREMENTS

Generally, revisions occur once every three years, however, interim revisions may occur. 40 CFR §131.20 gives procedures to follow when reviewing or revising Oklahoma's WQS. It states:

(a) State review. The State shall from time to time, but at least once every three years, hold public meetings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. Any water body segment with water quality standards that do not include the uses specified in section 101(a)(2) of the Act shall be re-examined every three years to determine if any new information has become available. If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly. Procedures States establish for identifying and reviewing water bodies for review should be incorporated into their Continuing Planning Process.

(b) Public participation. The State shall hold a public hearing for the purpose of reviewing water quality standards, in accordance with provisions of State law, EPA's water quality management regulation (40 CFR 130.3(b)(6)) and public participation regulation (40 CFR part 25). The proposed water quality standards revision and supporting analyses shall be made available to the public prior to the hearing.

(c) Submittal to EPA. The State shall submit the results of the review, any supporting analysis for the use attainability analysis, the methodologies used for site-specific criteria development, any general policies applicable to water quality standards and any revisions of the standards to the Regional Administrator for review and approval, within 30 days of the final State action to adopt and certify the revised standard, or if no revisions are made as a result of the review, within 30 days of the completion of the review.

40 CFR § 131.21 goes on to outline EPA review and approval requirements after submittal of water quality standards. It states:

(a) After the State submits its officially adopted revisions, the Regional Administrator shall either:

(1) Notify the State within 60 days that the revisions are approved, or

(2) Notify the State within 90 days that the revisions are disapproved.

Such notification of disapproval shall specify the changes needed to assure compliance with the requirements of the Act and this regulation, and shall explain why the State standard is not in compliance with such requirements. Any new or revised State standard must be accompanied by some type of supporting analysis.

(b) The Regional Administrator's approval or disapproval of a State water quality standard shall be based on the requirements of the Act as described in Secs. 131.5 and 131.6, and, with respect to Great Lakes States or Tribes (as defined in 40 CFR 132.2), 40 CFR part 132.

Based upon the preceding regulations and the public participation regulations set forth in Part 25, public notice must be given and a public meeting held 45 days after Notice. Then, the document and all required justifications, are forwarded to EPA for either approval within 60 days or disapproved within 90 days.

STATE REQUIREMENTS

State law governing the procedure for amending the Oklahoma WQS is codified at title 82 O.S. Supp. 1993, §1085.30, which requires 20 days advance notice of public hearings by publication as required by the APA (codified at 75 O.S. 1991, § 250.1 and following as amended) and by mailing to the chief executive of each municipality and county in the areas affected, to affected permit holders, and to persons who have requested such notice. Because the Oklahoma WQS are "rules" under the APA, they must be amended in accordance with the procedure for "rulemaking" provided in the APA. This rulemaking procedure must comply with the requirements of the Small Business Regulatory Flexibility Act. It is summarized in the following discussion.

PUBLIC NOTICE OF RULEMAKING INTENT

Prior to the revision of the Standards, the OWRB is required to publish notice of the intended action in The Oklahoma Register, a semi-monthly publication of the Secretary of State Office of Administrative Rules. The notice must include several elements prescribed by §303(B), including a brief summary of the rule; the proposed action being taken; the specific legal authority authorizing the proposed rule; the time, place and manner in which interested persons may make oral or written comments; the time, place and manner in which interested persons may demand a hearing, if a hearing is not specifically provided; and where copies of the proposed rule(s) may be obtained for review by the public. Prior to or within three (3) days of the publication of the notice in The Oklahoma Register, the agency must mail a copy of the notice to all persons who have made a timely request to the agency for advance notice of its rulemaking proceedings. For the Oklahoma WQS, this will generally include the WQS Mailing List and the standing Water Resources Board Mailing List.

CONSIDERATION OF COMMENTS AND POSSIBLE EFFECTS ON SPECIFIED GROUPS

The OWRB must allow a comment period for at least 20 days after publication of the notice for all interested persons to submit data, views or arguments, orally or in writing. The agency must "consider fully" all written and oral submissions regarding the proposal.

The OWRB must also consider the effect its intended action may have on "the various types of business entities" and "the various types of consumer groups." If the OWRB finds that its proposed rule may adversely affect any business entity or consumer group, then it may modify its proposed rule to exclude that type of business entity or activity. In the case of business entities, upon a finding of possible adverse effect, the agency may also "tier" its action to provide rules, penalties, fines or reporting procedures and forms which vary according to the size of a business or its ability to comply or both.

RULEMAKING HEARING

82 O.S. Supp. 1993, §1085.30, requires a public hearing on proposed WQS amendments. Accordingly, the notice of rulemaking intent must specify the time and place of the hearing.

The hearing may not be held earlier than 20 days after the notice is published in The Oklahoma Register. At the hearing, persons may present oral argument, data, and views on the proposed rule.

In addition, Title 27A O.S. Supp. 1993, § 1-1-102 requires each State environmental agency to participate in these hearings.

This process must comply with the requirements of the Small Business Regulatory Flexibility Act.

PREPARATION OF RULE IMPACT STATEMENT

The OWRB is required to issue a "rule impact statement" for a proposed rule prior to or within 15 days after the publication of the notice of rulemaking intent.

The rule impact statement shall include the elements specified in §303(D)(2), which include a brief description of the purpose of the rule; a description of the classes of persons who most likely will be affected by the proposed rule, including classes who will bear the cost of the rule and who will benefit from the rule; the probable costs to the agency and any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on State revenues; a determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the rule; and the date the rule impact statement was prepared. Note, however, that an insufficiency or inaccuracy in the contents of the rule impact statement is not a ground for invalidating the rule. Moreover, the rule impact statement may be modified after any hearing or comment period afforded per §303.

Before the OWRB publishes its notice of rulemaking intent, to the extent an agency for good cause finds the preparation of a rule impact statement or the specified contents thereof are unnecessary, impracticable or contrary to the public interest in the process of adopting a particular rule, the agency may request the Governor to waive the requirement. (Section 303(D)(3))

If not waived by the Governor before the notice is published, then the agency must complete the rule impact statement.

ADOPTION OF THE PROPOSED RULE BY THE OKLAHOMA WATER RESOURCES BOARD

At the time the OWRB staff's recommendations for adoption are submitted to the OWRB members for review and consideration, each State environmental agency shall have the opportunity to present written comments to the OWRB members.

Section 303(E) provides that "upon completing the requirements of this section, an agency may adopt a proposed rule." Section 250.3(2) states that "'adopted' means that a proposed rule has been approved by the agency but has not been reviewed by the Legislature and the Governor...."

Note that in order to avoid complications later, the rule should be adopted in the style of the language and format required by the Secretary of State, since the rule must be submitted to the Governor in the same format. Note also that §303(E) provides that no rule is valid unless it is adopted in substantial compliance with the provisions of §303. When the permanent rule becomes "adopted" it is still weeks, if not months, away from becoming effective.

FILING WITH GOVERNOR, SECRETARY STATE, AND LEGISLATURE

Once the OWRB adopts a revised or new WQS provision, it has ten (10) days to file one copy of the rule with the Governor and two copies each with the Speaker of the House of Representatives and the President Pro Tempore of the Senate. The Governor and Legislature are entitled to review and either approve or disapprove the rule. Copies of the rule must also be filed with the Secretary of State. Each of these steps are discussed more fully below.

GUBERNATORIAL REVIEW

Section 303.1(A) requires the OWRB to file a copy of the rule and a copy of an agency rule report with the Governor for approval. The agency rule report condenses information about the rule and must include the elements prescribed by §303.1(E), including the name and address of the agency, the title and number of the rule, the date the notice of rule making intent was published, a brief summary of the content of the rule, the date and location of the meeting at which the rule was adopted, the members of the OWRB and their recorded votes on the adoption, and a statutory citation of authority for the rule. The agency must also submit to the Secretary of State for publication in The Oklahoma Register a statement that the adopted rule has been submitted to the Governor.

The Governor has 45 calendar days after receipt of the rule to approve or disapprove it. If the Governor approves the rule, the Governor shall immediately notify the OWRB in writing and give notice of the approval to the Speaker, President Pro Tempore, and Secretary of State for publication in The Oklahoma Register. If the Governor disapproves the rule, the Governor shall return the entire document to the OWRB with written reasons for the disapproval, and notice of the disapproval shall likewise be given to the Speaker, President Pro Tempore, and Secretary for publication. If the Governor does not expressly approve the rule within the 45-day period, the rule is disapproved by operation of §303.2(A)(2). However, §303.2(B) provides that a gubernatorial-disapproved rule may still become effective if the rule is approved by a joint resolution of the Legislature pursuant to §308(B).

LEGISLATIVE REVIEW

Section 308(A) requires the agency to submit two copies of the rule and two copies of the agency rule report to both the Speaker of the House and the President Pro Tempore of the Senate. The agency must also submit to the Secretary of State's Office of Administrative Rules for publication in The Oklahoma Register a statement that the rules have been submitted to the Legislature. The elements required to be set forth in the agency rule report to the Legislature are the same as those required for the agency rule report filed with the Governor; see §303.1.

Except as otherwise provided in §308, the Legislature shall have 30 legislative days to review the rules. Rules may be disapproved in whole or in part by the Legislature. Section 308(E).

Upon receipt of the adopted rules, the Speaker and President Pro Tempore shall assign the rules to appropriate legislative committees for legislative review. The Speaker and President Pro Tempore may each establish a rule review committee or designate standing committees of each house to review administrative rules. § 307.1. Such committees shall review the rules in an advisory capacity and may make recommendations concerning the rule to their respective houses, or to the agency, or both. §307.1(C).

By the adoption of a joint resolution, the Legislature may (1) disapprove any rule, (2) waive the 30 legislative day review period and approve the rule, or (3) otherwise approve the rule. The waiver of the 30 legislative day review period may also be done with a concurrent resolution.

The Legislature may by concurrent resolution disapprove a proposed rule or proposed rule amendment. Such a concurrent resolution must be approved by both houses prior to the end of the 30 legislative day review period. Section 308(B)(2) provides that any such concurrent resolution shall not require the approval of the Governor, and any rule so disapproved shall be invalid and of no effect regardless of the approval by the Governor of the rule.

Any resolution disapproving a rule shall be filed with the Secretary of State for publication in The Oklahoma Register.

Whenever a rule is disapproved by joint resolution or concurrent resolution as provided in §308(B), the agency does not have authority to submit an identical rule except during the first 60 calendar days of the next regular legislative session.

Timing in submitting the rule to the Legislature is critical. If the rule is submitted to the Legislature before April 1 of any year, it shall be deemed approved by the Legislature if (a) the Legislature is in regular session and has failed to disapprove the rule within 30 legislative days after the submission of the rule, or (b) the Legislature has adjourned before the expiration of the 30 legislative day period and has failed to disapprove the rule. However, if the rule is submitted to the Legislature after April 1 of the year, the rule is deemed approved by the Legislature only if the Legislature is in regular session and fails to disapprove the rule within 30 legislative days after the rule has been submitted. In the event the Legislature adjourns after April 1 and before 30 legislative days expire, the rule shall be carried over for consideration by the Legislature during the next regular session and the required 30 legislative day review period begins on the first day of such succeeding regular session. The OWRB has two alternatives to try to avoid these consequences of filing after April 1: it may (1) request direct legislative approval by adoption of a joint resolution waiving the 30 legislative day review period and approving the rule, or adoption of a joint resolution otherwise approving the rule, or (2) it may adopt emergency rules.

FINAL ADOPTION

Upon legislative and gubernatorial approval, a rule attains the status of "final adoption." Section 308.1 provides that upon approval by the Legislature and the Governor, or upon approval by a joint resolution of the Legislature pursuant to §308(B) (i.e., a joint resolution waiving the 30 legislative day review period and approving the rule, or a joint resolution otherwise approving the rule), a rule shall be considered "finally adopted." However, there are still several more steps that must be completed before the rule becomes effective.

FILING FINALLY ADOPTED RULE WITH SECRETARY OF STATE

After a Water Quality Standard Revision becomes finally adopted, the OWRB has 30 calendar days to file the rule and the number of copies specified by the Secretary of State with the Secretary of State Office of Administrative Rules. The text of the rule submitted for publication shall be the same as the text considered by the Legislature and Governor.

Section 251(B)(2) prescribes several requirements that the agency must follow in conjunction with filing the rule with the Secretary of State. The first two of these requirements must be adhered to from the earliest stages of rule drafting. First, the rules must be prepared in plain language that can be easily understood. Second, the agency shall not unnecessarily repeat statutory language, and where it is necessary to refer to statutory language to effectively convey the meaning of the rule interpreting that language, the reference shall clearly indicate that portion which is statutory and that which is the agency's amplification or interpretation of that language

Additional requirements prescribed by §251(B)(2) include:

1. An indication whether the rule is new, amends an existing permanent rule, or repeals an existing permanent rule. If amendatory, any deleted language shall be shown by strikeout and any new language shall be shown by underscoring;

2. If the rule supersedes an existing emergency rule, a statement to that effect;

3. A reference to any rule requiring a new or revised form used by the agency, in a note to the rule. The secretary of state shall insert that reference in the Oklahoma register as a notation to the affected rule;

4. An analysis, prepared in plain language, of new or amended rules. The analysis shall include a reference to any statute that the rule interprets, any related statute or any related rule; and

5. Other information required by the secretary of state.

Section 251(B)(2)(i) also provides that the agency may change the format of existing rules without any rule making action in order to comply with the Secretary's standard provisions for publication in The Oklahoma Register and Oklahoma Administrative Code (OAC), so long as there is no substantive change to the rule.

PUBLICATION AND PROMULGATION

The Secretary of State is to publish the WQS revisions in the first issue of The Oklahoma Register published per §§251, 253, 256, 303, 303.1 and 308, after the date of acceptance of the rule by the Secretary. Publication of rules and other items in The Oklahoma Register and the OAC is a major subject in itself, and is discussed more thoroughly below. In the context of this discussion of rulemaking procedure, it is sufficient at this point to state that once the rule has been filed and published in The Oklahoma Register, and otherwise complies with the APA, it shall be considered "promulgated."

EFFECTIVE DATE

Section 304(B) provides that each rule "finally adopted" is effective 10 calendar days after publication in The Oklahoma Register pursuant to §255 unless a later date is required by statute or specified in the rule, in which case the later date is the effective date.

PUBLICATION OF RULES IN THE OKLAHOMA REGISTER AND THE OAC

The Oklahoma Register (the "Register") is the State counterpart to the Federal Register for publication of State agency rulemaking developments such as notices of rulemaking intent, adoption of rules, submission of adopted rules for gubernatorial and legislative review, and approval and promulgation of rules. Additionally, the Register has served for years as the official publication for promulgated rules or summaries of lengthy promulgated rules.

1. The Oklahoma Register

   Section 255 provides that the Secretary of State is authorized and directed to publish the Register not less than monthly for publication of new permanent rules, amendments or revocations of rules, emergency rules, and any notices of such rulemaking process.(The Register is now being published twice per month and is also used for publication of Executive Orders.) The Secretary may provide for the publication of rules in summary form when the rules are so lengthy that publication would be "too costly"; the summary is to be prepared by the submitting agency and must state where the text of the rule may be obtained. The Secretary of State is required to keep a copy of all rules, new rules, amendments and revocations of existing rules on file and available for public inspection in the Secretary of State's Office of Administrative Rules during normal office hours.

   The Secretary also must send a copy of each publication of the Register to every county clerk, to members of the Legislature upon request, and to such agencies, libraries and officials as the Secretary may select.

2. The OAC

   The OAC is a comprehensive compilation of law (i.e., agency rules of practice, procedure, and substantive law) for State agencies in a uniform format much like the Code of Federal Regulations for federal agencies. It is intended to be an annual, cumulative collection of the permanent rules published semi-monthly in the Register. The OAC will not contain emergency rules. These are left to be published only in the Register.

Rules which are submitted and accepted for codification by June 30 of each year must be published in the next succeeding OAC or supplement. The OAC and its supplements must be published annually, and should be published as soon as possible after August 30 of each year.

Section 257.1 lists several public offices which are entitled to receive, as soon as available from the Secretary of State, without cost, one copy of the printed volumes of the OAC and its supplements. These offices include:

- The county clerk of each county;
- Several specified State offices including the attorney general, governor, and speaker and president pro tempore; and
- The Department of Libraries for the Law Library.

To complement this free availability via public offices, the Secretary of State is authorized to sell or otherwise distribute the OAC and its supplements. The OAC shall be made generally available by the Secretary of State at a cost sufficient to defray the cost of publication and mailing.

3. Effect of Failure to Publish in *The Oklahoma Register* or OAC

Reading §§250.7 and 256 together, it may be concluded that the official permanent rules of the State shall be those which are published in the Register prior to the compilation of rules due to be completed by January 1, 1992; upon that date, any permanent rule not included in the official compilation by the Secretary of State in the OAC becomes void and has no effect.

The official permanent rules of the State shall be (1) those published in the OAC or its annual supplement, and (2) those published in the Register after the closing date for publication of the last preceding OAC or OAC supplement. Permanent rules published in the Register but not published in the next succeeding publication of the OAC or OAC supplement become void.

NON-STATUTORY ACTIVITIES FOR WATER QUALITY STANDARDS REVISIONS

Board staff may hold a series of public meetings prior to the formal public hearing. These informal meetings have proven beneficial in that the informal setting promotes an active dialogue between Board staff and affected or concerned parties. It is during these informal meetings that scientific justification documents and policy questions are discussed.

EMERGENCY WATER QUALITY STANDARDS RULEMAKING

The procedure for promulgating emergency rule provisions in the Oklahoma WQS is governed primarily by §253. They may be distinguished from permanent rules in several ways. Generally, emergency rules can be adopted by the OWRB at any time with or without an abbreviated notice and hearing process in order to respond to a compelling, extraordinary circumstance. They are not necessarily subject to immediate Legislative review, although they are subject to immediate gubernatorial approval before they can become effective. The Legislature can review and disapprove the rule or otherwise affect its effective term. Emergency rules are not permanent but are effective for only a limited period of time.

FINDING OF COMPELLING, EXTRAORDINARY CIRCUMSTANCE

Section 253(A) states that "[i]f an agency finds that an imminent peril to the preservation of the public health, safety, welfare, or other compelling extraordinary circumstance requires an emergency rule, amendment, revision, or revocation of an existing rule, then an agency may initiate emergency rulemaking procedures in an effort to promulgate a rule to meet the emergency. In practice, much emergency rulemaking is done as a stopgap measure to track changes in federal statutory or administrative agency law, or state statutory law, which must be implemented before permanent rules can be promulgated. In such cases, the emergency rules are put into effect until they are superseded by permanent rules.

ABBREVIATED NOTICE AND HEARING, RULE IMPACT STATEMENT

Section 253(J) provides that the notice and hearing, rule impact statement, agency rule report, and statement of submission requirements in permanent rulemaking are not applicable in emergency rulemaking. However, if an agency determines that an abbreviated notice and hearing procedure or an abbreviated rule impact statement are necessary, then this section does not prohibit such abbreviated procedures. Moreover, an agency has discretion to prepare an agency rule report although it is not required for emergency rulemaking.

ADOPTION AND FILING WITH GOVERNOR

Before the OWRB adopts an emergency rule, it must prepare the rule in the proper format required by the Secretary of State. Upon adoption, §253(B) requires the agency to transmit the rule to the Governor, and §253(C) requires the Governor to submit the emergency rule to the Secretary of State for review of proper formatting.

GUBERNATORIAL APPROVAL OR DISAPPROVAL

Section 253(C)(1) provides that the Governor shall review the emergency rule and decide whether or not it should be approved. Section 253(D)(2) provides that the Governor has 45 calendar days to review and approve or disapprove the emergency rule.

If the Governor fails to approve the emergency rule within the 45 calendar day period, the rule is deemed disapproved according to §253(D)(2). In any event, if the Governor disapproves the emergency rule, the Governor shall return the entire rule document to the agency with reasons for the disapproval. The agency then may elect to modify the emergency rule and resubmit it to the Governor for approval.

PROMULGATION

If the Governor approves the emergency rule, the emergency rule shall be considered promulgated and shall be effective immediately, unless a later effective date is specified in the rule.

FILING WITH THE LEGISLATURE

A copy of the Governor's approval and the emergency rule shall be submitted by the agency to the Speaker and President Pro Tempore.

FILING WITH SECRETARY OF STATE AND PUBLICATION

The Governor's approval of the emergency rule shall be published in the next publication of *The Oklahoma Register* following approval by the Governor. §253(E)(3).

As a result of the "fast track" emergency rulemaking process, agencies are required by §304(B)(2)(b) to take appropriate measures to make emergency rules known to the persons who may be affected by them.

EFFECTIVE TERM; LEGISLATIVE REVIEW

An emergency rule may specify an expiration date that will control the rule's effective term unless other provisions of the APA dictate a different result.

In cases where the emergency rule does not state an expiration date (i.e., it is intended to have a continuing effect), §253(H)(1) requires the agency to initiate rulemaking proceedings to promulgate a permanent rule to supersede the emergency rule. If an emergency rule is superseded by another emergency rule prior to the enactment of a permanent rule, the latter emergency rule will retain the same expiration date as the superseded emergency rule, unless otherwise authorized by the Legislature.

According to §253(F), emergency rules "shall be effective from the date of approval by the Governor or a later date as specified in the approved emergency rule, unless otherwise specifically provided by the Legislature, through the first day of the next succeeding Regular Session of the Oklahoma Legislature, after the promulgation of such emergency rule, and shall be in full force and effect through July 14 following such session unless it is made ineffective pursuant to" §253(H).

Section 253(G) provides that "No agency shall adopt any emergency rule which establishes or increases fees, except during such times as the Legislature is in session, unless specifically mandated by the Legislature or federal legislation, or when the failure to establish or increase fees would conflict with an order issued by a court of law".

Section 253(H) provides in paragraph 2 thereof that any promulgated emergency rule shall be made ineffective by (a) legislative disapproval of the emergency rule, (b) supersession by the promulgation of a permanent rule, (c) legislative disapproval of an adopted permanent rule based upon the emergency rule, or (d) an earlier expiration date if specified in the emergency rule. Paragraph 3 of subsection H provides that emergency rules in effect on the first day of a legislative session shall be null and void on July 15 immediately following sine die adjournment of the Legislature unless otherwise specifically provided by the Legislature. In the event of such nullity, the agency is expressly prohibited from evading this result by adopting the emergency rule again or adopting new emergency rules of similar scope or intent.

COORDINATION OF NEW STANDARDS, CRITERIA AND IMPLEMENTATION POLICIES

Oklahoma's WQS and Implementation documents are evolutionary documents. Consequently, as required by the CWA, at least once every three years, the WQS undergo a revision. During these revisions, modification suggestions to the current WQS are accepted from EPA, other federal and state agencies, special interest groups and private citizens. Although all comments and suggestions are considered, time and staffing constraints may prohibit an in depth evaluation of all suggestions. Those comments with the greatest potential merit will receive the greatest scrutiny.

WATER QUALITY STANDARDS CRITERIA MODIFICATION

Scientific advances and changes in public policy will periodically require the addition of new narrative and numerical water quality criteria. These criteria modifications may occur at any time, but will generally occur during the triennial revision process. During the triennial revision public participation process, justification for changes/modifications will be presented. The final adoption process is specified in a previous section.

WATER QUALITY STANDARDS IMPLEMENTATION MODIFICATION

To effectively implement Oklahoma's WQS into permits, enforcement, or other regulatory activities, WQS Implementation Documents are required. These documents are housed in a different chapter. Development of Implementation documents will be driven by Oklahoma's WQS. Consequently, Implementation documents must reflect the principals outlined in Oklahoma's WQS. This requires that Implementation documents will be developed either simultaneously or subsequent to the Standards. The development of Implementation documents will also require prioritization. This prioritization will consider existing needs and require input from other state and federal agencies.

Title 82 O.S. §1085.30 Subsection C states: "The standards of quality of the waters of the State, implementation documents and classification of such waters or any modification or change thereof shall be adopted and otherwise comply with the APA and shall be enforced by all State agencies within the scope of their jurisdiction." Consequently, all WQS Implementation documents will be subjected to the public participation process as outlined in the APA. Both new, and modifications to existing documents are subject to APA requirements. These documents will principally reside in OAC 785:46. They may also be found in this document. Although it is anticipated that Implementation documents will be dynamic, only those concepts supported by the WQS may be considered. Conversely, not all concepts found in the WQS are currently implemented. It is anticipated that additional implementation documents will be developed over time.

PART II PROCEDURES FOR ASSIGNMENT OF BENEFICIAL USES

Procedures for assignment of beneficial uses are discussed in the following OWRB technical report TRWQ2001-1: http://www.owrb.ok.gov/studies/reports/reports_pdf/TR2001_1_Protocols_Wadable.pdf

PART III WATER QUALITY STANDARDS IMPLEMENTATION

The explanation of how both narrative and numerical criteria found within Oklahoma's WQS are to be translated into permits (commonly called water quality standards implementation) is statutorily assigned to the OWRB. These implementation procedures are to be followed in the development of both industrial and municipal permits under the National Pollutant Discharge Elimination System (NPDES).

WATER QUALITY STANDARDS IMPLEMENTATION DOCUMENTS

Statutory authority to develop and promulgate water quality standards implementation documents to be utilized by all Oklahoma environmental agencies in the discharge of their duties has historically resided with the OWRB. OWRB staff, through cooperation with other appropriate State agencies and Region 6 of 'the Environmental Protection Agency (EPA), have promulgated water quality standards implementation procedures at OAC 785:46. Because these implementation procedures must adapt to new and ever dynamic water quality standards requirements, as they may be promulgated from time to time in OAC 785:45, OAC 785:46 must also be periodically updated.

Each State environmental agency has been mandated by 27A O.S. §1-1-202(B), as enacted by Senate Bill 549, to promulgate a Water Quality Standards Implementation Plan (WQSIP) for its jurisdictional areas of environmental responsibility. DEQ's WQSIP is contained in Appendix A to OAC 252:690. Certain water quality standards implementation procedures are being transferred by the OWRB to DEQ for its jurisdictional areas as part of the cited WQSIP mandate. Implementation procedures in OAC 785:46 apply to all State environmental agencies. Implementation procedures in OAC 252:690 apply only to DEQ's jurisdictional areas.

Procedures and content from these two implementation documents (OAC 785:46 and OAC 252:690) are reiterated in part in this and the following chapter. Because the CPP is not promulgated by DEQ as a rule, implementation procedures found in OAC 785:46 and OAC 252:690 take precedence over those outlined in the CPP, should there be any inconsistencies.

These two implementation documents represent the minimum requirements necessary to ensure discharger compliance with specific criteria of the WQS. Nothing contained within these implementation documents shall be construed to limit additional or more restrictive requirements placed on the permittee by DEQ as permitting authority.

Because of the potential impact of WQS Implementation Documents to permittees and the environment, the OWRB and DEQ are required to subject these implementation documents to the rulemaking process as described in the APA. This includes public notices and comment periods, public hearings, Board approvals, and legislative and gubernatorial approvals. These requirements are outlined in the previous chapter concerning State requirements for water quality standards approval.

PURPOSE, SCOPE, AND APPLICABILITY OF IMPLEMENTATION DOCUMENTS

See OAC 785:46 and OAC 252:690. Definitions and terms relevant to water quality standards implementation are found at OAC 785:45-1-2, OAC 785:46-1-2, and OAC 252:690-1-2.

CHAPTER 3

PERMITTING PROCEDURES

INTRODUCTION

The water quality provisions of the Oklahoma Environmental Quality Act (OEQA) provide that pollution of the waters of the State constitutes a menace to public health and welfare, creates public nuisances, is harmful to wildlife, fish and aquatic life, and impairs beneficial uses of water. It is therefore the public policy of this State to conserve the waters of the State and protect, maintain and improve the quality of such water for its legitimate beneficial uses. No waste or pollutant shall be discharged into any waters of the State or otherwise placed in a location likely to affect such waters without first being given the degree of treatment or taking such other measures as necessary to further the prevention, abatement and control of new or existing water pollution.

The primary mechanism used to control pollution from point source discharges to waters of the State is through the issuance of pollutant discharge permits. These permits may include schedules of compliance and other such conditions to prevent, control or abate pollution. They include such water-quality related and technology-based effluent limitations as are necessary to protect the water quality and existing and designated beneficial uses of the waters of the State. A sound basis for development of these effluent limitations is important to assure the permit is both reasonable and protective of waters of the State.

DEVELOPING EFFLUENT LIMITATIONS

Developing an effluent limitation in a permit is a multi-step process. The first step involves assuring that a certain minimum level of treatment is provided for a particular pollutant or category of pollutant. This is usually established through effluent limitation guidelines (ELGs) promulgated at 40 CFR Parts 400-499 for industrial dischargers, or through the definition of secondary treatment promulgated at 40 CFR Part 133 for municipal dischargers; unless more stringent State requirements apply. DEQ has promulgated a more stringent definition of secondary treatment at OAC 252:606-5-2. In those cases where there are no ELGs available for a particular pollutant or industrial category the permit writer may use Best Professional Judgment (BPJ) in establishing a site-specific technology-based limitation.

The second step involves comparing the monthly average technology-based limit developed in the first step to applicable water quality standards requirements. A more stringent, site-specific water quality-based limit for a particular pollutant may be required to protect the water quality of the receiving water. The more stringent of the monthly average technology-based or monthly average water quality-based limit, along with its associated weekly average or daily maximum limit, as appropriate, is used in the permit. For the purpose of comparing technology-based concentration limits with water quality-based concentration limits for industries where the technology-based loading limits are production-based, the permit writer should calculate loading limit-equivalent concentrations using $Q_{e(30)}$ as the flow basis.

TECHNOLOGY-BASED REQUIREMENTS

The OEQA provides that the Environmental Quality Board shall have the power and duty to promulgate rules implementing or effectuating the Oklahoma Pollutant Discharge Elimination System (OPDES) Act. Such rules may incorporate by reference any applicable rules, regulations and policies of EPA adopted under the CWA. Such rules shall be in reasonable accord with the EPA regulations and policies, including rules which allow the inclusion of technology-based effluent limitations in discharge permits to the extent necessary to protect the designated and existing beneficial uses of the waters of the State and to comply with the requirements of the CWA. In addition, they include rules, which establish pretreatment standards and apply, in permits, applicable national standards of performance pursuant to Section 306 of the CWA.

Regulations promulgated by DEQ at OAC 252: 606-1-3 adopt by reference the majority of 40 CFR Part 125 (Criteria and Standards for the National Pollutant Discharge Elimination System). The regulations adopted by reference include Criteria and Standards for Imposing Technology-Based Treatment Requirements under Sections 301(b) and 402 of the Act, Criteria for Extending Compliance Dates for Facilities Installing Innovative Technology under Section 301(k) of the Act, Criteria and Standards for Determining Fundamentally Different Factors under Sections 301(b)(1)(A), 301(b)(2)(A) and (E) of the Act, Criteria for Determining Alternative Effluent Limitations under Section 316(a) of the Act, Criteria Applicable to Cooling Water Intake Structures under Section 316(b) of the Act, Criteria for Extending Compliance Dates under Section 301(I) of the Act, and Criteria and Standards for Best Management Practices Authorized under Section 304(e) of the Act.

In general, these regulations require that technology-based treatment requirements under section 301(b) of the Act represent the minimum level of control that must be imposed in a permit issued under section 402 of the Act. Permits must contain the following technology-based treatment requirements:

- For POTWs, effluent limitations based upon secondary treatment, and the best practicable waste treatment technology.
- For dischargers other than POTWs:
    - Effluent limitations based on the best practicable control technology currently available (BPT);
    - For conventional pollutants, effluent limitations based on the best conventional pollutant control technology (BCT); and
    - For all toxic pollutants, and all pollutants which are neither toxic nor conventional, effluent limitations based on the best available technology economically achievable (BAT).

Technology-based treatment requirements may be imposed in permits by either application of EPA promulgated ELGs to dischargers by category or subcategory, or on a case-by-case basis to the extent that EPA promulgated ELGs are not applicable, or by a combination of these methods. Technology-based treatment requirements are applied prior to or at the point of discharge. They cannot be satisfied through the use of "non-treatment" techniques such as flow augmentation and in-stream mechanical aerators. However, these techniques may be considered as a method of achieving water quality standards on a case-by-case basis when the technology-based treatment requirements are not sufficient to meet the standards, the discharger agrees to waive any opportunity to request a variance under section 301(c), (g), or (h) of the Act, and the discharger demonstrates that such a technique is the preferred environmental and economic method to achieve the standards after consideration of alternatives such as advanced waste treatment, recycle and reuse, land disposal, changes in operating methods, and other available methods. Technology-based effluent limitations may also be established for solids, sludge, filter backwash, and other pollutants removed in the course of treatment or control of wastewater in the same manner as for other pollutants.

EFFLUENT LIMITATION GUIDELINES (ELGS)

Regulations promulgated by DEQ at OAC 252: 606-1-3 also adopt by reference all of 40 CFR Parts 401-471 (Effluent Guidelines and Standards). This regulation prescribes effluent limitations guidelines for existing sources, standards of performance for new sources and pretreatment standards for new and existing sources pursuant to the Clean Water Act. The ELGs include the following categories:

Asbestos manufacturing point source category (Part 427)
Aluminum forming point source category (Part 467)
Battery manufacturing point source category (Part 461)
Canned and preserved fruits and vegetables processing point source category (Part 407)
Canned and preserved seafood processing point source category (Part 408)
Carbon black manufacturing point source category (Part 458)
Cement manufacturing point source category (Part 411)
Centralized waste treatment point source category (Part 437)
Coal mining point sources category (Part 434)
Coil coating point source category (Part 465)
Copper forming point source category (Part 468)
Dairy products processing point source category (Part 405)
Electroplating point source category (Part 413)
Electrical and electronic components point source category (Part 469)
Explosives manufacturing point source category (Part 457)
Feedlots point source category (Part 412)
Ferroalloy manufacturing point source category (Part 424)
Fertilizer manufacturing point source category (Part 418)
Glass manufacturing point source category (Part 426)
Grain mills point source category (Part 406)
Gum and wood chemicals manufacturing point source category (Part 454)
Hospital point source category (Part 460)
Ink formulating point source category (Part 447)
Inorganic chemical manufacturing point source category (Part 415)

Iron and steel manufacturing point source category (Part 420)
Landfills point source category (Part 445)
Leather tanning and finishing point source category (Part 425)
Meat products point source category (Part 432)
Metal finishing point source category (Part 433)
Metal molding and casting point source category (Part 464)
Mineral mining and processing point source category (Part 436)
Nonferrous metals forming/metal powders point source category (Part 471)
Nonferrous metals manufacturing point source category (Part 421)
Oil and gas extraction point source category (Part 435)
Ore mining and dressing point source category (Part 440)
Organic chemicals, plastics, and synthetic fibers category (Part 414)
Paint formulating point source category (Part 446)
Paving and roofing materials (tars and asphalt) point source category (Part 443)
Pesticide chemicals point source category (Part 455)
Petroleum refining point source category (Part 419)
Pharmaceutical manufacturing point source category (Part 439)
Phosphate manufacturing point source category (Part 422)
Photographic point source category (Part 459)
Plastics molding and forming point source category (Part 463)
Porcelain enameling point source category (Part 466)
Pulp, paper, and paperboard point source category (Part 430)
Rubber manufacturing point source category (Part 428)
Soap and detergent manufacturing point source category (Part 417)
Steam electric power generating point source category (Part 423)
Sugar processing point source category (Part 409)
Textile mills point source category (Part 410)
Timber products processing point source category (Part 429)
Transportation equipment cleaning point source category (Part 442)
Waste combustors point source category (Part 444)

TREATMENT LEVELS

The ELGs include limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), the best conventional pollutant control technology (BCT), the best available technology economically achievable (BAT), new source performance standards (NSPS), pretreatment standards for new sources (PSNS) and pretreatment standards for existing sources (PSES). These technology-based limits consider the category of industry that produces the pollutant. Thus, the regulations take into account the specific factors unique to a particular type of industry (manufacturing process, type and quantity of pollutants generated, types of treatment facilities available to treat the pollutants, etc.). In using this approach, the regulations remove any economic advantage based upon pollution control for similar categories of industry. In theory, for example, a pulp and paper mill on the west coast of the U.S. would be required to meet the same BCT pollution controls for sulfate as an identical plant located on the east coast (unless there were special site-specific water quality concerns which had to be addressed).

These treatment levels were originally required under the CWA in a phased approach for existing industries. BPT was originally required by July 1, 1977 and applies to conventional, non-conventional, and toxic pollutants from all industries discharging wastes to waters of the U.S. BCT was originally required by July 1, 1984 and applies only to the discharge of conventional pollutants. BAT was also originally required by July 1, 1984 and applies to non-conventional and toxic pollutants. It is important to note that BPT represents the average of the best existing waste treatment performance within each industry category or subcategory. Thus, in most cases for conventional and non-conventional pollutants, BCT and BAT levels of treatment were found to be no more stringent than the old BPT levels and therefore, in many cases, BPT may equal BCT or BAT. In other words, the best practicable treatment may also be the best available treatment. However, BAT levels for many toxic pollutants have been added to the guidelines, where no such requirements previously existed under the BPT requirements.

Conventional pollutants include Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Fecal Coliform, pH, and Oil & Grease. Toxic pollutants are those defined in Section 307(a)(1) of the CWA and include:

Acenaphthene
Acrolein
Acrylonitrile
Aldrin/Dieldrin
Antimony and compounds
Arsenic and compounds
Asbestos
Benzene
Benzidine
Beryllium and compounds
Cadmium and compounds
Carbon tetrachloride
Chlordane (technical mixture and metabolites)
Chlorinated benzenes (other than di-chlorobenzenes)
Chlorinated ethanes (including 1,2-di-chloroethane, 1,1,1-trichloroethane, and hexachloroethane)
Chloroalkyl ethers (chloroethyl and mixed ethers)
Chlorinated naphthalene
Chlorinated phenols (other than those listed elsewhere; includes trichlorophenols and chlorinated cresols)
Chloroform
2-Chlorophenol
Chromium and compounds
Copper and compounds
Cyanides
DDT and metabolites
Dichlorobenzenes (1,2-, 1,3-, and 1,4-di-chlorobenzenes)
Dichlorobenzidine
Dichloroethylenes (1,1-, and 1,2-dichloroethylene)
2,4-Dichlorophenol
Dichloropropane and dichloropropene
2,4-Dimethylphenol
Dinitrotoluene
Diphenylhydrazine
Endosulfan and metabolites
Endrin and metabolites
Ethylbenzene
Fluoranthene
Haloethers (other than those listed elsewhere; includes chlorophenylphenyl ethers, bromophenylphenyl ether, bis(dichloroisopropyl) ether, bis-(chloroethoxy) methane and polychlorinated diphenyl ethers)
Halomethanes (other than those listed elsewhere; includes methylene chloride, methylchloride, methylbromide, bromoform, dichlorobromomethane
Heptachlor and metabolites
Hexachlorobutadiene
Hexachlorocyclohexane
Hexachlorocyclopentadiene
Isophorone
Lead and compounds
Mercury and compounds
Naphthalene
Nickel and compounds
Nitrobenzene
Nitrophenols (including 2,4-dinitrophenol, dinitrocresol)
Nitrosamines
Pentachlorophenol

Phenol
Phthalate esters
Polychlorinated biphenyls (PCBs)
Polynuclear aromatic hydrocarbons (including benzanthracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenz-anthracenes, and indenopyrenes)
Selenium and compounds
Silver and compounds
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
Tetrachloroethylene
Thallium and compounds
Toluene
Toxaphene
Trichloroethylene
Vinyl chloride
Zinc and compounds

Non-conventional pollutants are those which do not fall under either of the above categories and include parameters such as Chemical Oxygen Demand, Total Organic Carbon, Color, etc.

CATEGORIZATION/SUBCATEGORIZATION

In order to properly use and apply effluent guidelines information, a determination must first be made as to what industrial category is applicable to the facility under consideration. The subcategory must then be determined. This is primarily done using the Standard Industrial Classification (SIC) Code. Usually the SIC Code will determine the appropriate category. However, in some cases the plants do not fall into a single category and then a single subcategory. In this regard it is helpful not to place the plant into a category or subcategory, but rather find all those categories under which the plant falls. By using a process of elimination by either classifying the categories as "not applicable" or "possibly applicable" the proper categorization can be made. In those cases where multiple categories and subcategories are applicable, the final effluent limitation may be calculated by the summation of individual production and loading rates.

PRODUCTION

Most effluent limitation guidelines are expressed in terms of allowable pollutant discharge rate per unit of production rate. To determine permit limits, these standards are multiplied by the facility's production rate. In most cases, where production is constant from day to day and month to month, the average production rate is used to calculate limitations. In practice, production rates vary because of market factors, maintenance, product changes, down times, breakdowns, and facility modifications. In those cases where the production rate of a facility varies with time, the value used to calculate limits should be based on a reasonable measure of the actual production rate that is expected to exist during the term of the permit.

The use of a limited amount of production data in estimating the production for a specific facility should be avoided. For example, the data from a particular month may be unusually high and thus lead to the derivation of an effluent limitation, which is not actually reflective of the normal plant operations. Effluent limitation guidelines already account for variations, which occur within long-term production rates. The use of too short a time frame in the calculation of production based limitations for a specific industrial facility may lead to "double accounting" of the variability factors. The objective in determining a production estimate for a facility is to develop a single estimate of the long-term average production rate (in terms of mass of product per day), which can reasonably be expected to prevail during the term of the permit.

ALTERNATE LIMITS

If production rates are expected to change significantly during the life of the permit, the permit can include alternate limits. These alternate limits would become effective when production exceeds a threshold value, such as during seasonal production variations. Typically, alternate limits are developed when changes in production exceed 50%. Alternate limits should be used only after careful consideration and only when a substantial increase or decrease in production is likely to occur.

MASS AND CONCENTRATION LIMITS

Most of the technology-based effluent limitations for industrial facilities are expressed in terms of allowable mass (in units of pounds or kilograms) of pollutant per day. In order to encourage the proper operation of the treatment facility at all times, equivalent concentration limits should usually be included in the permit. This is also helpful in tracking plant performance to compare treatment efficiencies with those indicated in treatability manuals for a particular type of waste. In determining applicable effluent concentration limitations, the monthly average and daily maximum mass loading limits divided by $Q_{e(30)}$ will provide concentration limits, which are comparable with the way mass limits are calculated from concentration limits.

In certain instances, the use of concentration limits may be counterproductive since they may discourage the use of innovative techniques such as water conservation. Likewise, in some instances it is inappropriate to express limitations in terms of mass. This includes limitations for pH, temperature, radiation, or where the mass of the pollutant cannot be related to a measure of operation and permit conditions insure that dilution will not be used as a substitute for treatment. For example, in those cases where stormwater discharges are commingled with process water discharges, use of mass loading limitations for those pollutants present only in the stormwater is most likely inappropriate. Special requirements and conditions may be required to insure adequate treatment is provided those pollutants present in the process stream as well as in the stormwater stream. The applicability of concentration limits should therefore be a case-by-case determination based upon the best professional judgment of the permit writer.

OTHER ELG CONSIDERATIONS

Development documents should be utilized to confirm that proper categorization and sub-categorization has been determined for a particular facility. In addition, information provided in the development document can sometimes be used to determine if an appropriate treatment technology or other control measures are being used at a facility. For example, the development document may indicate that a particular treatment is the recognized BPT treatment technology for a particular subcategory, and that BAT treatment consists of the existing BPT technology plus in-plant control measures or additional end-of-pipe treatment. The choice of whether to institute in-plant control measures (e.g., water reuse, water reduction through conservation, chemical substitution, segregation of waste streams, etc.) or provide additional treatment is ultimately up to the facility to decide. However, the regulatory requirements associated with a particular course of action should be considered during permit development and may affect selection of the most appropriate course of action.

In some cases toxic pollutants are specifically regulated through effluent guidelines for a particular category and subcategory of facility. Other toxic pollutants may be present in the discharge at low levels or at levels difficult to quantify because of the difficulty of performing lengthy and expensive analytical procedures. Information in the development documents can be used to determine when this may be a concern. In some cases an indicator pollutant, such as TSS, is sometimes used to effectively control toxic pollutant levels even though the toxic substances are not expressly regulated by numerical limitations. Where conventional pollutants are used as indicator pollutants for toxic pollutants, BAT limitations for these pollutants have been established to assure installation and performance of waste treatment technology that is adequate for the removal of toxic pollutants.

Sludge management is another topic usually addressed in the development document for a particular point source category. In some cases, existing sludge management practices may be of particular concern for a particular industrial subcategory. Special conditions addressing sludge management may be warranted in the permit in this case. However, because of the wide range in production, types of handling systems, and processing these special conditions are specific to a particular facility and should be developed on a case-by-case basis by selecting from among the variety of alternatives that are available.

BEST PROFESSIONAL JUDGEMENT (BPJ)

For non-categorical industries, or where there are no ELGs for a particular pollutant or industrial subcategory the permit drafter may use Best Professional Judgment (BPJ) in establishing a site-specific technology-based limitation. BPJ is defined as the highest quality technical opinion developed by a permit writer after consideration of all reasonably available and pertinent data or information, which

forms the basis for the terms and conditions of an NPDES permit. BPJ allows the permit writer considerable flexibility in establishing permit terms and conditions. However, inherent in this flexibility is the burden on the permit writer to show that his/her BPJ is based on sound engineering analysis. The determination of a permit condition is subject to challenge by the permittee and/or the public, and, if unresolved through negotiation between the parties, may be the subject of an evidentiary hearing or other legal challenge. Therefore, the need for the permit condition and the basis for its establishment should be clearly defined and documented.

BEST POLLUTANT CONTROL TECHNOLOGY CURRENTLY AVAILABLE (BPT) REQUIREMENTS

In setting BPT limitations on a case-by-case basis, the permit drafter must consider certain factors, including:

- The age of equipment and facilities involved,
- The process employed,
- The engineering aspects of the application of various types of control techniques,
- Process changes,
- Non-water quality environmental impact (including energy requirements), and
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application.

BEST CONVENTIONAL POLLUTANT CONTROL TECHNOLOGY (BCT) REQUIREMENTS

In setting BCT limitations on a case-by-case basis, the permit drafter must consider certain factors, including:

- The age of equipment and facilities involved,
- The process employed,
- The engineering aspects of the application of various types of control techniques,
- Process changes,
- Non-water quality environmental impact (including energy requirements),
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived, and
- The comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources.

BEST AVAILABLE TECHNOLOGY ECONOMICALLY ACHIEVABLE (BAT) REQUIREMENTS

In setting BAT limitations on a case-by-case basis, the permit drafter must consider certain factors, including:

- The age of equipment and facilities involved,
- The process employed,
- The engineering aspects of the application of various types of control techniques,
- Process changes,
- Non-water quality environmental impact (including energy requirements), and
- The cost of achieving such effluent reduction.

OTHER BPJ CONSIDERATIONS

Case-by-case limitations may be expressed, where appropriate, in terms of toxicity (e.g., "the fathead minnow acute LC_{50} of the effluent from outfall 001 shall be > 100%"). However, it must be shown that the limits reflect the appropriate requirements (for example, technology-based or water-quality based standards) of the Act.

A technically sound and reasonable permit is not likely to be successfully challenged by the permittee or a third party. In this context, "technically sound" permit conditions means that the conditions are achievable with existing technology and "reasonable" means they are achievable at a cost which is affordable by the facility. Historically, some of the other factors such as age, process employed, and non-water quality impacts have assumed lesser importance than the technical and economic feasibility (technically sound and reasonable) tests.

SECONDARY TREATMENT REQUIREMENTS

MECHANICAL PLANTS

- For facilities discharging to perennial streams, a monthly average of 30 mg/L BOD_5 and 30 mg/L TSS shall be considered secondary treatment. A $CBOD_5$ of 25 mg/L is considered to be equivalent to a BOD_5 of 30 mg/L.
- For discharges to intermittent streams (those with 7-day, 2-year, low flow of zero), a monthly average of 20 mg/L BOD_5 and 30 mg/L TSS shall be considered secondary treatment. A $CBOD_5$ of 18 mg/L is considered to be equivalent to a BOD_5 of 20 mg/L.

LAGOON SYSTEMS

For discharges where treatment is solely provided by lagoons, a monthly average of 30 mg/L BOD_5 (25 mg/L $CBOD_5$) and 90 mg/L TSS shall be considered secondary treatment whether the discharge is to a perennial or an intermittent stream. This is not applicable to a discharge to a lake.

DISCHARGES TO LAKES

A discharge to a lake is defined as any discharge from a point source, which is either a direct discharge into a lake, or within five river miles upstream of the conservation pool of any lake. A lake is considered to be an impoundment of the waters of the State, which exceeds fifty acre-feet in volume, which either:

- Is owned or operated by a unit of government,
- Appears in Oklahoma's clean lakes inventory, or
- Is a privately-owned lake which has beneficial uses similar to those of publicly-owned or operated lakes.

For all discharges to lakes, a monthly average of 20 mg/L BOD_5 and 30 mg/L TSS shall be considered secondary treatment. A $CBOD_5$ of 18 mg/L is considered to be equivalent to a BOD_5 of 20 mg/L.

WATER QUALITY BASED REQUIREMENTS

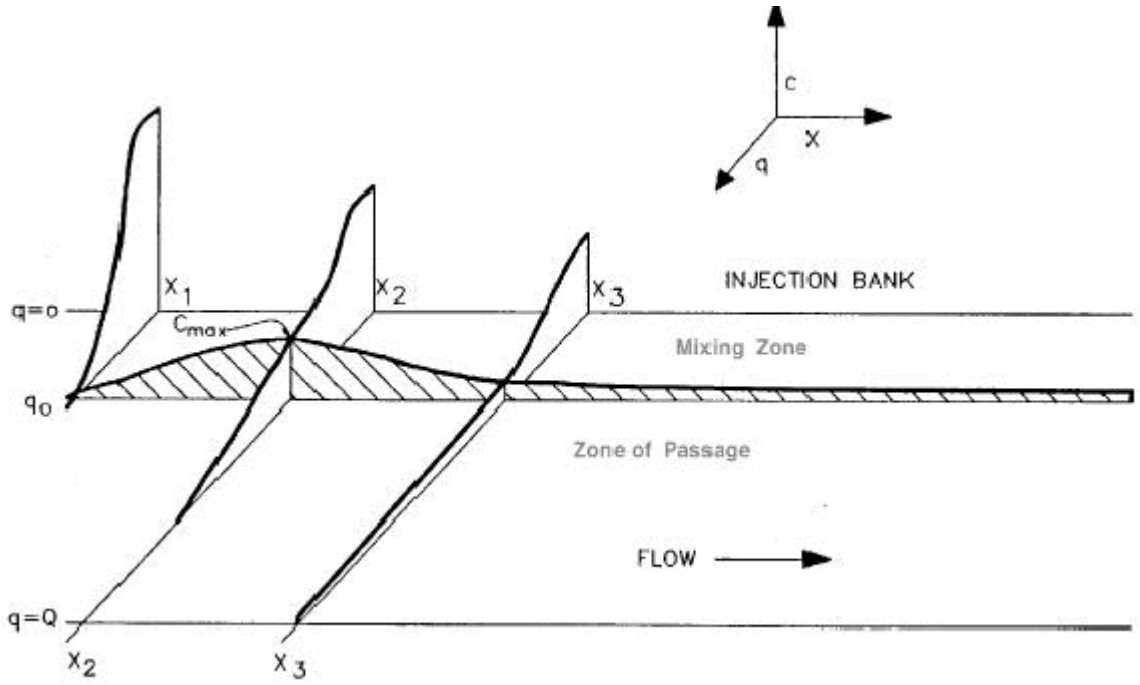
Any discharge to waters of the State must meet the requirements of Oklahoma's Water Quality Standards (OWQS), as amended. Water quality standards have three components: designated uses, narrative and numerical criteria to protect those uses, and an antidegradation policy. The following sections describe the strategy used to assure that a discharge meets the requirements of these standards.

MIXING ZONE REQUIREMENTS

The OWQS define mixing zone and zone of passage requirements for discharges to streams. These mixing zone requirements vary depending on the designated beneficial use. Mixing zone equations to implement these requirements are defined at OAC 785:46. Temperature and chronic toxicity criteria for toxic substances for the Fish and Wildlife Propagation use are applied at the edge of a mixing zone which ensures a zone of passage of 75% of the stream flow. Acute toxicity criteria for the Fish and Wildlife Propagation use are applied at the edge of an acute toxicity mixing zone, the extent of which is a function of the discharge's concentration divided by its waste load. All other criteria are applied after complete mixing Figure 1 below illustrates the temperature and chronic toxicity mixing zone and zone of passage for a river bank outfall point source discharge into a stream. If a discharger uses a diffuser at their outfall such that complete mixing is achieved instream, permit limits could be calculated using a complete-mix mass balance model. Documentation showing size, geometry, etc., and/or an instream study may be required to confirm complete mixing.

Mixing zones in lakes are designated on a case-by-case basis. However, for permitting purposes for numerical chronic toxicity criteria, a mixing zone is defined to extend a radius of 100 feet from the source. The Fischer model for pipe discharges and the Fischer variation for canals is used to perform the wasteload evaluation for these pollutants.

FIGURE 1: MIXING ZONE AND ZONE OF PASSAGE FOR A RIVER BANK OUTFALL POINT SOURCE DISCHARGE



DISCHARGES TO STATE LAKES

PURPOSE

The purpose of this policy is to establish generally consistent procedures for use in determining the appropriate effluent limitations for wastewater treatment facilities (WWTF) that discharge into Oklahoma lakes. The Oklahoma Lakes Policy applies to point source discharges to all lakes and reservoirs and streams within 5 miles of the conservation or normal pool elevation of lakes or reservoirs, and establishes effluent limitations for new or expanded wastewater treatment facilities. This policy is applicable to all point source discharges into lakes or reservoirs. This policy supercedes and replaces the Guidance for Proposed Discharges to Grand Lake which applies to discharges into Grand Lake. Any discharge must also comply with all applicable provisions of Oklahoma's Water Quality Standards [OAC 785:45].

BACKGROUND

As an effort to prevent water quality in Grand Lake from further deteriorating, the Oklahoma Department of Environmental Quality (DEQ) established the *Guidance for Proposed Discharges to Grand Lake* in 1999. This guidance only applied to point source discharges into Grand Lake. Maintaining the quality of Oklahoma's other publicly owned lakes and reservoirs is equally important. Point source discharges from wastewater treatment facilities directly into lakes or reservoirs can have negative impacts on the water quality. DEQ normally does not have the site specific water quality information necessary to calculate on an individual basis the most appropriate effluent limitations for proposed new or expanded facilities discharging to State lakes. The following procedures will be used to set effluent limitations.

All other possible alternatives should be considered prior to a new direct discharge to a lake or reservoir. The preferred alternatives include:

- Discharge into existing wastewater treatment systems
- Discharge to a stream that is not a tributary to the lake or reservoir
- Total Retention Lagoons
- Irrigation/land application to achieve no discharge or run off

Proposed new discharges must comply with the Procedure for Approval of New Discharges found in Chapter 4 of the Continuing Planning Process (CPP) document. It is the responsibility of the owner (municipality, private developer or others) and owner's engineer to provide data justifying the reason to choose a discharging facility over the above-preferred alternatives. Before constructing any outfall line for a new discharge to a lake managed by the Corps of Engineers, the applicant shall have obtained the necessary easements and approvals for construction of the outfall from the Corps, submitted plans and specifications in accordance with DEQ rules and obtained a DEQ permit to construct the line. If a direct discharge to a lake or reservoir is allowed, the following procedure will apply.

PROCEDURE

For purposes of this policy, a lake is an impoundment of the waters of the State which exceeds fifty acre-feet in volume which either:

- Is owned or operated by a unit of government, or
- Appears in Oklahoma's Clean Lakes Inventory, or
- Is a privately-owned lake which has beneficial uses similar to those of publicly-owned or operated lakes.

For discharges into tributary streams further than two miles but within five miles of the conservation or normal pool elevation of lakes and reservoirs, a water quality model for the stream will be used to determine the wasteload allocations for oxygen-demanding substances and TSS for the discharge. However, in no case will the limitation be less stringent than 20 mg/L BOD_5 and 30 mg/L TSS. Limitations on bacteria and total phosphorus as specified in this policy will also be required.

Discharges into streams within two miles of the conservation or normal pool elevation of lakes and reservoirs shall be considered as if the discharges were occurring directly into the lakes or reservoirs. No new discharge will be permitted to any lake with a normal pool storage capacity of less than 23,000 acre-feet. If a lake discharge is allowed, the following limitations will apply:

1. Limitations (See Table 1)

TABLE 1: LAKE DISCHARGE LIMITATIONS

Lake Discharge Limitations		
Effluent Parameter	Limitation (monthly average)	
	Lake not impaired for low D.O.	Lake impaired for low D.O.
$CBOD_5$	10.0 mg/L	5.0 mg/L
NH_3-N	2.0 mg/L	2.0 mg/L
TSS	15 mg/L	15 mg/L
DO – Summer (Jul – Oct)	4 mg/L	5.0 mg/L

Lake Discharge Limitations		
Effluent Parameter	Limitation (monthly average)	
	Lake not impaired for low D.O.	Lake impaired for low D.O.
DO – Seasonal (Nov – Jun)	5 mg/L	5 mg/L
Total Phosphorus✦	1 mg/L	1 mg/L
Bacteria	Disinfection required year round	

✦Phosphorus limits will be required in these circumstances:

- All new discharges to a lake, regardless of status of the lake
- For expanded existing discharges:
  - The lake is included on Oklahoma's list of impaired waters (the 303(d) list) as impaired for phosphorus or chlorophyll-α; or
  - The lake is within an area designated in Oklahoma's Water Quality Standards as a Nutrient Limited Watershed

2. Applicability

This policy applies to the following domestic sewage wastewater facilities discharging directly into or within five miles of the conservation or normal pool elevation of lakes and reservoirs:

- New facilities – this could include facilities for new sources, or for replacing existing sources such as septic tanks or non-discharging facilities. For new minor discharges, the limitations in this policy will apply. Additional evaluation in a detailed site-specific study may be required on a case-by-case basis where a relatively large discharge is proposed for a relatively small lake. Limitations for proposed new major discharges must be evaluated in a detailed site-specific study. The limitations in this policy will be the minimum requirements.

- Expanded existing facilities – facilities which request a higher permit discharge flow. The limitations in this policy apply to existing major and minor facilities.

All other existing facilities without any change will not be affected by this policy.
Proposals for industrial discharges will be evaluated on a case by case basis.

These limitations are minimum requirements. If a TMDL is approved for the lake or reservoir, any more stringent limitations contained in the TMDL will apply.

This policy does not preclude the responsibility of the facility owner to obtain appropriate approvals from the Corps of Engineers or any other entity responsible for control of State lakes or reservoirs.

REASONABLE POTENTIAL EVALUATION

An effluent limit shall be developed and placed in a permit when a discharge has reasonable potential to exceed an applicable water quality criterion. This evaluation will be based upon meeting a particular numerical or narrative water quality criterion under regulatory effluent and receiving stream flow and concentration conditions. If the receiving stream is a tributary to a waterbody with different beneficial uses and water quality criteria, those uses and criteria will also be maintained. In cases where multiple criteria apply to a pollutant, the criterion resulting in the most stringent monthly average limit shall be used as the basis for the pollutant's permit limits.
Factors to be considered when evaluating the potential for a discharge to exceed water quality criteria include the following:

- Expected upstream pollutant concentrations and/or loading
- Expected effluent pollutant concentration and/or loading
- Mixing zone requirements
- Overlapping impacts from multiple discharges and/or dischargers

Reasonable potential evaluations are specific to the type of designated use to be protected: fish and wildlife propagation, fish consumption, public and private water supplies, agriculture (livestock and irrigation), body contact recreation, and waterbody aesthetics at a minimum unless otherwise designated in the OWQS. In addition, they must also consider OWQS antidegradation requirements for waterbodies designated as outstanding resource waters (ORW), high quality waters (HQW), sensitive water supplies (SWS), or waters of particular ecological or recreational significance.

REASONABLE EXPECTATION EVALUATION

The first step in performing a reasonable potential evaluation involves determining if a pollutant can reasonably be expected to be present in the effluent as a result of processes or operations at the facility. This generally requires an in-depth review of processes and operations performed at a facility. An inventory of raw materials, products, treatment chemicals, and additives should be performed to establish the quantity and presence of regulated pollutants and their tendency to be discharged in a stream. Effluent analysis should be done for any pollutant expected to be present in the wastewater as a result of this process and operations review. Any pollutant detected in the effluent will be evaluated to determine reasonable potential.

EFFLUENT SAMPLING PROCEDURES

COMPOSITE SAMPLING

Composite sampling must be utilized where effluent characteristics may reasonably be expected to vary. At the discretion of the permitting authority, samples from discharges with overlapping mixing zones may be combined in proportion to the flow from each outfall. Combining of discharges with overlapping mixing zones will be allowed only if it is reasonable to expect that each discharge contains the pollutant(s) of concern in some measure. Where it is apparent that one discharge will merely serve to dilute the other, combining of such discharges will be disallowed. If the discharge is from a lagoon with a retention time greater than 24 hours and it is reasonable to assume that the contents of the lagoon are well mixed (i.e., not subject to plug flow), composite samples may not be necessary. The permitting authority may determine that a grab sample of the discharge is sufficient.

GRAB SAMPLING

Where grab sampling is required, or where it is permitted as described in (a) above, it must be collected within a 15-minute window.

SAMPLE COLLECTION, HANDLING, AND ANALYSIS

Collection, preservation, shipment, storage and analysis of samples shall be accomplished in accordance with EPA-approved methods at 40 CFR Part 136.

EFFLUENT AND RECEIVING WATER DATA SET ANALYSIS

An important step in performing a reasonable potential evaluation is to assure that data used to characterize effluent and receiving water quality is defensible and is representative of the critical conditions associated with a particular water quality criterion. DEQ implementation criteria for effluent characterization are described at OAC 252:690-3-1 through 3-9. DEQ implementation criteria for receiving water (background) characterization are described at OAC 252:690-3-1, 3-2 and 3-10 through 3-16.

Nonrepresentative data or data determined to be inappropriate should not be used in the evaluation process. Examples of such situations include: data points representing statistical outliers, data collected prior to significant changes in inputs or processes, inappropriate laboratory or method QA/QC, use of a non-certified laboratory, use of unapproved sampling and/or analytical methods, and insufficient analytical sensitivity (detection levels higher than prescribed minimum quantification levels, or MQLs. In general, data will not be discarded without first requiring the submission of new data which is more appropriate, more representative and/or of higher quality.

MINIMUM QUANTIFICATION LEVELS (MQLs)

Table 2 lists MQLs developed by EPA Region 6 accepted by DEQ for use in assessing acceptable analytical sensitivity. The MQL is defined as the lowest concentration at which a particular substance can be quantitatively measurable. Although the listed MQLs are the lowest concentrations required to be used in the calibration of a measurement system they are not necessarily the minimum acceptable sensitivity. They were chosen to be appropriate for a scan of all pollutants present in a discharge and do not represent the most sensitive analysis that may be achieved for a particular pollutant (volatile and semivolatile organics). If specific pollutants are known to be present and pose water quality concerns, the discharger should be required to analyze those pollutants by the most sensitive approved method available and determine a site-specific quantification level, which will be used in the reasonable potential evaluation.

In accordance with OAC 252:690-3-2, measurable levels for effluent and background data shall be less than or equal to the MQLs listed in Table 2. Where a background or effluent concentration data set reflects some measurable and some unmeasurable levels of a substance (at least three of which must me measureable) at or below the established MQL, DEQ will use Robust ROS to estimate the unmeasureable quantities. If a substance is unmeasurable in all samples collected for a background or effluent concentration dataset, DEQ will use a zero level. If analytical data submitted reflects a substance is unmeasurable at a measurable level higher than the established MQL, DEQ will allow the permit applicant to provide additional data analyzed at an appropriate measurable level. If the applicant does not do so in a timely fashion, DEQ will assume the substance is present at the reported measurable level. Where a pollutant has an established MQL, DEQ will include a provision in the permit requiring the measurable levels be less than or equal to the MQL. For effluent and receiving water characterization purposes, where the data set reflects both measurable and unmeasurable quantities (less than three measurable), an assumed value of one-half the reported level of sensitivity will be used for the unmeasurable quantities.

TABLE 2: MINIMUM QUANTIFICATION LEVELS (MQLS)

Substance		µg/L	EPA Method
Metals and Cyanide			
Antimony	(Total)*	60	200.7
Arsenic	(Total)*	10	206.2
Beryllium	(Total)*	5	200.7
Cadmium	(Total)†	1	213.2
Chromium	(Total)*	10	200.7
Chromium	(3+)*	10	200.7
Chromium	(6+)*	10	200.7
Copper	(Total)†	10	220.2
Lead	(Total)†	5	239.2
Mercury	(Total)*	0.2	245.1
Molybdenum	(Total)♫	30	200.7
Nickel	(Total)* (Freshwater)	40	200.7
Nickel	(Total)† (Marine)	5	249.2

* CRDL

† Method 213.2, 239.2, 220.2, 272.2

♫ Based on 3.3 times IDL published in 40 CFR Part 136, Appendix C

♁ No CRQL established

☂ CRQL basis, equivalent to ML

♬ ML basis, higher than CRQL

Substance		µg/L	EPA Method
Selenium	(Total)*	5	270.2
Silver	(Total)†	2	272.2
Thallium	(Total)*	10	279.2
Zinc	(Total)*	20	200.7
Cyanide	(Total)*	10	335.2
Dioxin			
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (TCDD)		0.00001	1613.0
Volatile Compounds			
Acrolein		50	624
Acrylonitrile		50	624
Benzene		10	624
Bromoform		10	624
Carbon Tetrachloride		10	624
Chlorobenzene		10	624
Chlorodibromomethane		10	624
Chloroethane		50	624
2-Chloroethyl vinyl ether		10	624
Chloroform		10	624
Dichlorobromomethane		10	624
1,1-Dichloroethane		10	624
1,2-Dichloroethane		10	624
1,1-Dichloroethylene		10	624
1,2-Dichloropropane		10	624
1,3-Dichloropropylene		10	624
Ethylbenzene		10	624
Methyl Bromide [Bromomethane]		50	624
Methyl Chloride [Chloromethane]		50	624
Methylene Chloride		20	624
1,1,2,2-Tetrachloroethane		10	624
Tetrachloroethylene		10	624
Toluene		10	624
1,2-trans-Dichloroethylene		10	624
1,1,1-Trichloroethane		10	624
1,1,2-Trichloroethane		10	624
Trichloroethylene		10	624
Vinyl Chloride		10	624
Acid Compounds			
2-Chlorophenol		10	625
2,4-Dichlorophenol		10	625
2,4-Dimethylphenol		10	625
4,6-Dinitro-o-Cresol [2 methyl 4,6-dinitrophenol		50	625
2,4-Dinitrophenol		50	625

† Method 213.2, 239.2, 220.2, 272.2

* CRDL

Dioxin National Strategy

Based on 3.3 times IDL published in 40 CFR Part 136, Appendix C

CRQL basis, equivalent to ML

ML basis, higher than CRQL

No CRQL established

§ CRQL basis, no ML established

CRQL basis, higher than ML

Substance	µg/L	EPA Method
2-Nitrophenol♬	20	625
4-Nitrophenol☂	50	625
p-Chloro-m-Cresol [4 chloro-3-methylphenol] ☂	10	625
Pentachlorophenol☂	50	625
Phenol☂	10	625
2,4,6-Trichlorophenol☂	10	625
Base/Neutral Compounds		
Acenaphthene☂	10	625
Acenaphthylene☂	10	625
Anthracene☂	10	625
Benzidine🔒	50	625
Benzo(a)anthracene☂	10	625
Benzo(a)pyrene☂	10	625
3,4-Benzofluoranthene☂	10	625
Benzo(ghi)perylene♬	20	625
Benzo(k)fluoranthene☂	10	625
Bis(2-chloroethoxy) methane☂	10	625
Bis(2-chloroethyl) ether☂	10	625
Bis(2-chloroisopropyl) ether☂	10	625
Bis(2-ethylhexyl) phthalate☂	10	625
4-Bromophenyl phenyl ether☂	10	625
Butyl benzyl phthalate☂	10	625
2-Chloronapthalene☂	10	625
4-Chlorophenyl phenyl ether☂	10	625
Chrysene☂	10	625
Dibenzo (a,h) anthracene♬	20	625
1,2-Dichlorobenzene☂	10	625
1,3-Dichlorobenzene☂	10	625
1,4-Dichlorobenzene☂	10	625
3,3'-Dichlorobenzidine♬	50	625
Diethyl Phthalate☂	10	625
Dimethyl Phthalate☂	10	625
Di-n-Butyl Phthalate☂	10	625
2,4-Dinitrotoluene☂	10	625
2,6-Dinitrotoluene☂	10	625
Di-n-octyl Phthalate☂	10	625
1,2-Diphenylhydrazine🔒	20	625
Fluoranthene☂	10	625
Fluorene☂	10	625
Hexachlorobenzene☂	10	625
Hexachlorobutadiene☂	10	625
Hexachlorocyclopentadiene☂	10	625
Hexachloroethane♬	20	625
Indeno (1,2,3-cd) pyrene♬ (2,3-o-phenylene pyrene)	20	625
Isophorone☂	10	625
Naphthalene☂	10	625
Nitrobenzene☂	10	625

☂ CRQL basis, equivalent to ML
♬ ML basis, higher than CRQL
🔒 No CRQL established
§ CRQL basis, no ML established

Substance	µg/L	EPA Method
N-nitrosodimethylamine♬	50	625
N-nitrosodi-n-propylamine♬	20	625
N-nitrosodiphenylamine♬	20	625
Phenanthrene▬	10	625
Pyrene▬	10	625
1,2,4-Trichlorobenzene▬	10	625
Pesticides		
Aldrin§	0.05	608
Alpha-BHC§	0.05	608
Beta-BHC§	0.05	608
Gamma-BHC (Lindane) §	0.05	608
Delta-BHC§	0.05	608
Chlordane§	0.2	608
4,4'-DDT§	0.1	608
4,4'-DDE (p,p-DDX) §	0.1	608
4,4'-DDD (p,p-TDE) §	0.1	608
Dieldrin§	0.1	608
Alpha-endosulfan§	0.1	608
Beta-endosulfan§	0.1	608
Endosulfan sulfate§	0.1	608
Endrin§	0.1	608
Endrin aldehyde§	0.1	608
Heptachlor§	0.05	608
Heptachlor epoxide§ (BHC-hexachlorocyclohexane)	0.05	608
PCB-1242§	1.0	608
PCB-1254§	1.0	608
PCB-1221§	1.0	608
PCB-1232§	1.0	608
PCB-1248§	1.0	608
PCB-1260§	1.0	608
PCB-1016§	1.0	608
Toxaphene§	5.0	608

§ CRQL basis, no ML established

▬ CRQL basis, equivalent to ML

♬ ML basis, higher than CRQL

DATA SET REQUIREMENTS FOR CALCULATING SUMMARY STATISTICS

EFFLUENT DATA

Arithmetic averages may be determined from whatever defensible effluent data is available. A log-normal distribution is assumed for the purpose of calculating summary statistics unless there is evidence to the contrary. Geometric means and other summary statistics (standard deviation and coefficient of variation) should only be determined where there is a sufficient number of measurable data points to do so. At least 10 data points, of which at least three are measurable, should be available for calculating geometric means and standard deviations. Where determinable, a geometric mean should always be used. Where individual data points are unavailable and/or where the detection level of unmeasurable data points is unknown and assumed to be one-half the MQL, an arithmetic mean may be substituted.

C_{95}, known as the 95^{th} percentile maximum likelihood effluent concentration, is the effluent concentration used to determine whether a discharge demonstrates reasonable potential to exceed an applicable water quality criterion.

Where sufficient effluent data is available to calculate C_{95} directly from effluent data set

Where sufficient effluent data is available (at least 10 data points total), C_{95} is determined directly from the effluent data set as the inverse of the cumulative log-normal distribution function at a 95% probability according to the following equation.

$$C_{95} = \mathrm{EXP}\left(\ln(x)_{avg} + 1.645 \times s_{\ln(x)}\right), \qquad (21)$$

where $\ln(x)_{avg}$ is the arithmetic mean of the log-transformed effluent data set and $s_{\ln(x)}$ is the standard deviation of the log-transformed effluent data set.

The standard deviation of a log-transformed effluent data set is calculated according to Equation 22.

$$s_{\ln(x)} = \sqrt{\frac{N\sum_{i=1}^{N}\left(\ln(x_i)^2\right) - \left(\sum_{i=1}^{N}\ln(x_i)\right)^2}{N(N-1)}}, \qquad (22)$$

where N is the number of data points in the effluent data set.

The standard deviation of a log-transformed data set applies only to the transformed data set and cannot be translated back into an equivalent untransformed data set standard deviation, i.e.,

$$\mathrm{EXP}\left(s_{\ln(x)}\right) \neq s_x \ . \qquad (23)$$

Although not required for reasonable potential determination, the coefficient of variation (CV) must be calculated for use in determining water quality-based permit limitations should reasonable potential be demonstrated for a pollutant. The CV is calculated according to the following equation:

$$CV = \frac{s_x}{C_{e(avg)}}, \qquad (24)$$

where s_x is the standard deviation of the (untransformed) effluent data set.

The standard deviation of an untransformed effluent data set is calculated as follows:

$$s_x = \sqrt{\frac{N\sum_{i=1}^{N}\left(x_i^{\,2}\right) - \left(\sum_{i=1}^{N}x_i\right)^2}{N(N-1)}}, \qquad (25)$$

where N is the number of data points in the effluent data set.

Where C_{95} must be estimated from the mean effluent concentration

Where less than 10 data points are available, C_{95} is estimated from the mean effluent concentration, $C_{e(mean)}$, assuming a coefficient of variation (CV) of 0.6, according to the following equation for a log-normal distribution:

$$C_{95} = C_{e(mean)} \times \mathrm{EXP}\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right), \qquad (26)$$

With the assumed CV value of 0.6, this equation reduces to

$$C_{95} = C_{e(mean)} \times 2.135. \qquad (27)$$

Degree of uncertainty inherent in small effluent data sets

The greater the size of an effluent data set, the greater the degree of certainty in characterizing its distribution. Conversely, as the size of a data set decreases, the degree of uncertainty inherent in characterizing its distribution increases. Below 10 data points the degree of uncertainty is sufficiently high as to warrant further examination. Consequently, additional effluent monitoring may be justified in some cases where the use of C_{95}, as estimated above using the mean effluent concentration, does not result in reasonable potential. As described in Section 3.3.2 of the Technical Support Document for Water Quality-Based Toxics Control, Publication No. EPA/505/2-90-001 (referred to hereafter as TSD), C_{95} may be estimated using the maximum observed effluent concentration, C_{max}, and the number of data points in the effluent data set. The TSD approach is used to determine whether there is sufficient cause to require further effluent monitoring and reassessment of reasonable potential. In order to distinguish between C_{95} values used for determining whether there is reasonable potential for the purpose of establishing water quality-based effluent limits from C_{95} values used for the purpose determining whether further effluent monitoring is justified, the term $C_{95(M)}$ is used for the latter.

For calculating $C_{95(M)}$, a log-normal distribution is assumed. Use of a 95% confidence level and a 95% probability basis results in the following equation for calculating $C_{95(M)}$:

$$C_{95(M)} = C_{e(max)} \times \frac{EXP\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right)}{EXP\left(z_N\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right)}, \qquad (28)$$

Where N is the number of data points, z_N is the upper 95th percentile of the normal distribution, and CV=0.6.

$$\text{Letting } RPF_{95(M)} = \frac{EXP\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right)}{EXP\left(z_N\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right)}, \qquad (29)$$

$$C_{95(M)} = C_{e(max)} \times RPF_{95(M)}. \qquad (30)$$

The following table lists the values of $RPF_{95(M)}$ for values of N from 1 to 9:

N	$RPF_{95(M)}$
1	6.199
2	3.795
3	3.000
4	2.585
5	2.324
6	2.141
7	2.006
8	1.898
9	1.811

$C_{95(M)}$ is used in the same manner as C_{95} in the various reasonable potential equations. Section B.4.b in this chapter describes permitting requirements should the use of $C_{95(M)}$ result in reasonable potential to exceed an applicable criterion.

RECEIVING WATER (BACKGROUND) DATA

With the exception of mineral constituents of agricultural significance (chlorides, sulfates and total dissolved solids), where no background data is available, the background concentration is assumed to be zero. Where determinable, a geometric mean should always be used. At least 10 data points, of which at least five are measurable, should be available for calculating geometric means. Where individual data points are unavailable and/or where the detection level of unmeasurable data points is unknown and assumed to be one-half the MQL, an arithmetic mean may be substituted.

In accordance with OAC 252:690-3-16, where background levels of chloride, sulfate and total dissolved solids are calculated from the yearly mean standards and sample standards published in Appendix F of the OWQS, the background level, C_b, is calculated as follows:

$$C_b = 2 \times C_{b(YMS)} - C_{b(SS)}, \qquad (31)$$

where $C_{b(YMS)}$ and $C_{b(SS)}$ are the published YMS and SS criteria, respectively. Background levels of these mineral constituents are always expressed as arithmetic averages. Segment-averaged YMS and SS criteria, because they aggregate data over broad areas which potentially may have widely-varying characteristics, should be used only if data for the receiving water of concern or site-specific data are not available. Site-specific data, where available, are always preferred. Where permit limits for one of these mineral constituents are required in a permit, background monitoring is recommended to establish site-specific background characteristics prior to such limit going into effect.

EFFLUENT CHARACTERIZATION

Effluent quality and quantity characterization must be consistent with the type of reasonable potential evaluation. The number and type of effluent samples taken to characterize a particular pollutant should be consistent with the regulatory mixing zone and stream flow conditions associated with each applicable criterion. Specific factors to be considered include the frequency, duration, and magnitude of pollutant levels in the discharge.

NUMERICAL CRITERIA FOR THE PUBLIC AND PRIVATE WATER SUPPLY USE

RAW WATER COLUMNN CRITERIA

Raw water column criteria are average values not to be exceeded instream. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set.

For municipal facilities, the regulatory effluent flow for raw water column criteria is the design flow of the facility.

For industrial facilities, the regulatory effluent flow for raw water column criteria is the highest 30-day average flow occurring in the most recent two year period of record. If a significant seasonal variability in flow is present, a seasonal regulatory effluent flow may be calculated for a particular season of the year. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

CRITERIA FOR THE PROTECTION OF HUMAN HEALTH FOR THE CONSUMPTION OF FISH FLESH AND WATER

Criteria to protect human health for the consumption of fish flesh and water are long term average values. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set.

For municipal facilities, the regulatory effluent flow for human health/fish flesh and water criteria is the design flow of the facility.

For industrial facilities, the regulatory effluent flow for human health/fish flesh and water criteria is the arithmetic mean of all measured effluent daily discharges using a period of record of not less than two years. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

NUMERICAL CRITERIA FOR FISH THE FISH AND WILDLIFE PROPAGATION USE

Aquatic toxicity and temperature criteria requirements are described in this section. Dissolved oxygen-based requirements are described in Section C of this Chapter.

ACUTE AND CHRONIC TOXICITY CRITERIA

Acute and chronic toxicity criteria for toxic substances are maximum values never to be exceeded instream. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set.

For municipal facilities, the regulatory effluent flow for acute toxicity criteria is the design flow of the facility.

For industrial facilities, the regulatory effluent flow for toxic substances is the highest 30-day average flow occurring in the most recent two year period of record. If a significant seasonal variability in effluent flow is present, a seasonal regulatory effluent flow may be calculated for a particular season of the year. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

TEMPERATURE CRITERIA

Numerical criteria for temperature are mean values. For purposes of performing reasonable potential evaluations for temperature when there is a reasonable expectation that the effluent contains a significant thermal component, the expected effluent value is calculated, using a non-parametric method, as the maximum likelihood estimator of the upper 95th percentile, in degrees Celsius, of the effluent daily maximum temperature data set.

For municipal facilities, the regulatory effluent flow for the temperature criterion is the design flow of the facility.

For industrial facilities, the regulatory effluent flow for the temperature criterion is the highest 30-day average flow occurring in the most recent two year period of record. If a significant seasonal variability in effluent flow is present, a seasonal regulatory effluent flow may be calculated for a particular season of the year. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

NUMERICAL CRITERIA FOR THE AGRICULTURE USE

Numerical criteria listed at Appendix F of OAC 785:45 for mineral constituents (chlorides, sulfates and total dissolved solids) are statistical measures of ambient levels present in specified waterbody segments around the State during the period from October 1976 through September 1983. Some of the data is characteristic of a specific USGS monitoring station, and others are segment averages of measured values at individual stations. Where data was obtained at a specific monitoring station, the yearly mean standard (YMS) is defined as the arithmetic mean of that station's historical data plus one standard deviation above the mean. The sample standard (SS) is defined as the arithmetic mean of the station's historical data plus two standard deviations above the mean. Segment averaged data is used to evaluate reasonable potential unless data specific to the site in question or to an upstream or downstream segment of the waterbody in question is available. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set.

For municipal facilities, the regulatory effluent flow is the design flow of the facility.

For industrial facilities, the regulatory effluent flow used to implement the YMS criterion is the arithmetic mean of all measured effluent daily discharges using a period of record of not less than two years, while the regulatory effluent flow used to implement the SS criterion is the highest 30-day average flow occurring in the most recent two year period of record. If a significant seasonal variability in flow is present, a seasonal regulatory effluent flow may be calculated for use with the SS criterion for a particular season of the year. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

NUMERICAL CRITERIA FOR THE PRIMARY BODY CONTACT RECREATION USE

Numerical criteria for enteric bacteria (coliform bacteria, *Escherichia col*i, or *Enterococc*i) are ~~the~~ geometric mean values never to be exceeded instream, and are applied during the "recreational" season of May 1 through September 30. Since the OWQS does not specify a mixing zone for enteric bacteria criteria, they are applied end-of-pipe. Therefore, reasonable potential is presumed to exist when there is a reasonable expectation that enteric bacteria are present in the effluent.

NUMERICAL CRITERIA FOR THE AESTHETICS USE

Numerical criteria for color are values never to be exceeded instream due to other than natural sources. For purposes of performing reasonable potential evaluations for color when there is a reasonable expectation that it is present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set, measured as "true" color.

For municipal facilities, the regulatory effluent flow is the design flow of the facility.

For industrial facilities, the regulatory effluent flow is the highest 30-day average flow occurring in the most recent two-year period of record. If a significant seasonal variability in flow is present, a seasonal regulatory effluent flow may be calculated for a particular season of the year. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

NUMERICAL CRITERIA FOR THE FISH CONSUMPTION USE

Criteria to protect human health for the consumption of fish flesh are long term average values. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected effluent value is calculated as the maximum likelihood estimator of the upper 95th percentile of the effluent data set.

For municipal facilities, the regulatory effluent flow for human health/fish flesh criteria is the design flow of the facility.

For industrial facilities, the regulatory effluent flow for human health/fish flesh criteria is the arithmetic mean of all measured effluent daily discharges using a period of record of not less than two years. Allowances should be made to account for expected fluctuations in production and resulting discharge levels over the life of the permit.

RECEIVING WATER CHARACTERIZATION

Receiving water characterization should be consistent with the type of reasonable potential evaluation. Data for determining background concentrations may be available from STORET or other water quality databases with adequate and documentable quality assurance procedures, such as Beneficial Use Monitoring Program (BUMP) reports or Use Support Assessment Protocol (USAP) monitoring results. The number and type of upstream samples taken to characterize a particular pollutant should be consistent with the regulatory conditions associated with a particular criterion. Specific factors to be considered include the frequency, duration and magnitude of pollutant levels in the upstream receiving water.

NUMERICAL CRITERIA FOR THE PUBLIC AND PRIVATE WATER SUPPLIES USE

Raw water column criteria are average values not to be exceeded instream. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected upstream (background) concentration is the long term average of the upstream data set, and is expressed as a geometric mean where sufficient data is available to do so.

Criteria to protect human health for the consumption of fish flesh and water are long term average values. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected upstream concentration is the long term average of the upstream data set. It is expressed as a geometric mean where sufficient data is available to do so.

The regulatory upstream flow for both raw water column and human health/fish flesh and water criteria is a long term average flow. This long term average flow is the mean annual average flow of the receiving water upstream of the point of effluent discharge. Determination of mean annual flows for gaged and ungaged streams is described in section E.5 of Chapter 2, Part III. Where mean annual flows from USGS stations are available, they may be adjusted for known perennial contributions to or withdrawals from the receiving water between the point of discharge and the gaging station.

Numerical criteria for total coliform bacteria are geometric mean values never to be exceeded instream. These bacterial criteria apply only where a discharge is located within five miles upstream of a public water supply intake. Pursuant to OAC 785:45-5-10(3)(D), total coliform bacteria criteria are applied year round if the primary body contact recreation (PBCR) use is not designated for the receiving water and during the "non-recreational" season only (October 1 through April 30) where the PBCR use is designated for the receiving water. Since the OWQS doe not specify a mixing zone for total coliform bacteria numerical criteria, they are applied end-of-pipe. Therefore, reasonable potential is presumed to exist when there is a reasonable expectation that total coliform bacteria are present in the effluent and the discharge is located within five miles upstream of a public water supply intake. In certain cases for modeling purposes where the Public and Private Water Supplies (PPWS) use applies instantaneously at some point downstream of a point of discharge, distance and time of travel parameters must be determined to estimate bacterial die-off at the point where the PPWS use applies. In such cases, the critical upstream flow is the long term average.

NUMERICAL CRITERIA FOR THE FISH AND WILDLIFE PROPAGATION USE

ACUTE AND CHRONIC TOXICITY CRTIERIA

Acute and chronic toxicity criteria for toxic substances are maximum values never to be exceeded instream. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected upstream (background) concentration is the long term average of the upstream data set, and is expressed as a geometric mean where sufficient data is available to do so.

For chronic toxicity criteria, the regulatory upstream flow is the greater of 1.0 cfs or 7Q2. Seasonal 7Q2s may be utilized where toxicity-based ammonia limits must be compared with DO-based ammonia limits. For acute toxicity criteria, the upstream flow is not applicable. Where 7Q2 flows are available from USGS gaging stations, they may be adjusted for known perennial contributions to or withdrawals from the receiving water between the point of discharge and the gaging station.

TEMPERATURE CRITERIA

Numerical criteria for temperature are mean values. For purposes of performing reasonable potential evaluations for temperature when there is a reasonable expectation that the effluent contains a significant thermal component, the regulatory ambient (critical) temperature, T_a, in degrees Celsius, is defined as follows for each type of aquatic community, with the exception of trout fisheries.

Aquatic Community	Critical Temperature (7T2)
Habitat-Limited Aquatic Community (HLAC)	Higher of 7T2 or 29.44°C
Warm Water Aquatic Community (WWAC)	Higher of 7T2 or 29.44°C
Exception: Arkansas River WWAC from Red Rock Creek to headwaters of Keystone Lake	Higher of 7T2 or 31.6°C
Cool Water Aquatic Community (CWAC)	26.1°C

The 7T2 is defined as the 7-day maximum temperature likely to occur with a 50% probability each year. The 7T2 is calculated using a moving average of seven consecutive days for each year in a given record. These seven-day receiving stream temperature values are ranked in descending order. An order number, m, is calculated based on the number of years of record, n, with a recurrence interval of 2 years, as m=(n+1)/2. The m^{th} highest average temperature is the 7T2.

Trout fisheries normally exceed the 20° C temperature criterion during critical conditions. Thus, reasonable potential to exceed the temperature criterion is always presumed to exist for trout fisheries, and the WLA is set equal to the 20°C criterion to protect the trout fishery use.

For temperature criteria, the regulatory upstream flow is the greater of 1.0 cfs or 7Q2. Where 7Q2 flows are available from USGS gaging stations, they may be adjusted for known perennial contributions to or withdrawals from the receiving water between the point of discharge and the gaging station.

NUMERICAL CRITERIA FOR THE AGRICULTURE USE

Numerical criteria listed at Appendix F of OAC 785:45 for mineral constituents (chlorides, sulfates and total dissolved solids) are statistical measures of ambient levels present in specified waterbody segments around the State (see section B.2.b(3)(b)(ii) of this chapter). Segment averaged criteria are used to evaluate reasonable potential unless data specific to the site in question or to an upstream or downstream segment of the waterbody in question is available. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected upstream value is calculated as described in section B.2.b(3)(b)(ii) of this chapter.

The regulatory upstream flow is a long-term average flow for implementing the YMS and a short-term average flow for implementing the SS. The long-term average flow is the mean annual flow; and the short-term average flow is equal to 68% of the mean annual flow. Determination of mean annual flows for gaged and ungaged streams are determined as described in section E.5 of Chapter 2, Part III.

NUMERICAL CRITERIA FOR PRIMARY BODY CONTACT RECREATION (PBCR) USE

Numerical criteria for enteric bacteria (coliform bacteria, *Escherichia coli*, or *Enterococci*) are geometric mean values never to be exceeded instream, and are applied during the "recreational" season of May 1 through September 30. Since the OWQS does not specify a mixing zone for enteric bacteria criteria, they are applied end-of-pipe. Therefore, reasonable potential is presumed to exist when there is a reasonable expectation that enteric bacteria are present in the effluent.

In certain cases for modeling purposes where the PBCR use applies instantaneously at some point downstream of a point of discharge, distance and time of travel parameters must be determined to estimate enteric bacterial die-off at the point where the PBCR use applies. In such cases, the critical upstream flow is the greater of 1.0 cfs or 7Q2.

NUMERICAL CRITERIA FOR THE AESTHETICS USE

Numerical criteria for color are values never to be exceeded instream due to other than natural sources. Thus, for purposes of performing reasonable potential evaluations for color when there is a reasonable expectation that it is present in the effluent, the expected upstream value is considered zero unless upstream color is from other than natural sources.

The regulatory upstream flow is the greater of 1.0 cfs or 7Q2.

NUMERICAL CRITERIA FOR FISH CONSUMPTION USE

Criteria to protect human health for the consumption of fish flesh are long-term average values. For purposes of performing reasonable potential evaluations for these pollutants when there is a reasonable expectation that they are present in the effluent, the expected upstream concentration is the long term average of the upstream data set. It is expressed as a geometric mean where sufficient data is available to do so.

The regulatory upstream flow is a long-term average flow. The long-term average flow is the mean annual flow of the receiving water upstream of the point of effluent discharge.

REPORTING UNMEASURABLE DATA

WATER QUALITY-BASED EFFLUENT LIMITATIONS REQUIREMENTS

REASONABLE POTENTIAL DEMONSTRATED

If a reasonable potential evaluation for a facility shows that a potential exists to exceed an applicable water quality criterion for a specific pollutant then a water quality-based effluent limitation shall be placed in the permit for that pollutant.

COMPLIANCE SCHEDULES

A compliance schedule pursuant to 40 CFR, Section 122.47, which allows no more than three years to complete any additional treatment plant construction or facility modifications needed in order to comply with a water quality-based limit may be included in the permit for existing facilities. New facilities, or existing facilities which propose increases in production or changes in operation which will result in the discharge of new pollutants or increased levels of existing pollutants, must meet the water quality-based limit at start-up.

WHOLE EFFLUENT TOXICITY

Whole effluent toxicity (WET) tests are used to assess discharger compliance with the narrative toxicity criterion to protect the fish and wildlife propagation beneficial use. WET testing involves measuring the aggregate toxicity of an effluent discharged into surface waters, including synergistic effects. The intent of this strategy is to prevent the point source discharge of wastewater which would results in either acute toxicity or chronic toxicity outside the [chronic] mixing zone of the receiving water. A WET limits may be applied to the discharge if, in the judgment of the permitting authority, reasonable potential exists to violate the narrative toxicity criterion. Reasonable potential to violate the narrative toxicity criterion is presumed to exist if a facility has a significant history of WET test failures, has been required to perform a toxicity reduction evaluation (TRE) as a result of WET test failures, or is known to discharge a toxic pollutant in toxic amounts not otherwise controlled with chemical-specific limits. Implementation procedures for WET testing and WET limits are described in sections B.3.e and B.4.a, respectively of this chapter.

OTHER WATER QUALITY CONSIDERATIONS

Development of a water quality-based limit is a multi-step process that must consider a number of factors. Some of the more important considerations are addressed below.

SITE-SPECIFIC CALCULATIONS

In many cases, criteria or requirements used to establish water quality-based limits are defined using a more general basis; e.g., waterbody segment-based criteria. A more specific value may be calculated if more detailed site-specific data is available. The following sections address the development of these more specific criteria.

SEVEN-DAY, TWO-YEAR LOW FLOW – 7Q2

For oxygen-demanding parameters, Oklahoma WQS define the seven-day, two-year low flow (7Q2) as the receiving stream flow for determining allowable discharge load to a stream. The flow is calculated as a moving average of seven consecutive days for each year in a given record, and represents a yearly low flow value. Authorized sources for 7Q2 values used in developing WLAs/TMDLs are as follows:

- USGS publication, Statistical Summaries of Streamflow in and near Oklahoma Through 2007, U.S. Geological Survey Scientific Investigations Report 2009–5135 , Lewis, J.M., and Esralew, R.A., 2009, or data obtained from USGS sources; or,
- WQMP updates (only if USGS data is not available).

If neither USGS data nor WQMP updates are available, a default 7Q2 of 1 cfs is assumed as described in Chapter 2, Part III of this document.

The 7Q2 is calculated as a moving average of seven consecutive days for each year in a given record. These seven-day low flow values are ranked in ascending order. An order number (m) is calculated based upon the number of years of record (n), with a recurrence interval (R) of two years, as m=(n+1)/R, where R = two years. A value of flow corresponding to the m^{th} order is taken as the seven day, two-year low flow for those historical data. Seasonal 7Q2s may also be determined in this same manner using flow data appropriate to the period covered by each season: April-May (Spring), June – October (Summer) and November – March (Winter).

OAC 785:45-5-12(f)(1)(B)(iii) allows use of a seasonal 7Q2 on streams designated as habitat-limited and warm water aquatic communities (HLAC and WWAC) for determination of allowable BOD loading. The seasonal 7Q2 is calculated as a moving average of seven consecutive days for the applicable dates specified in OAC 785:45-5-12(e)(1)(C) in a given period of record. These seven-day low flow values are ranked in ascending order. An order number (m) is calculated based upon the number of seasons (n) specified in OAC 785:45-5-12(e)(1)(C) during the period of record, with a recurrence interval (R) of two years, as m = (n+1)/R, where R = two years. A value of flow corresponding to the m^{th} order is taken as the seasonal seven-day, two-year low flow for those historical data.

A minimum of ten years of daily flow measurements for a particular site are required to calculate a 7Q2. If sufficient continuous data are not available to develop low-flow frequency curves then low-flow characteristics may be estimated by relating this data to nearby continuous-record sites. The partial-record site must have enough flow measurements to establish a correlation between it and a continuous-record (index) station. An index station must represent a specific area of the State with respect to topographic and geologic conditions that may have an effect on low flow and have no major regulation or other manmade changes in the drainage basin. Also, an index station must have the same period of record as the partial-record site. An attempt should be made to use streams of relatively small drainage area to avoid incorporating many varied topographic and geologic factors into one record. The index site should be less intermittent than any partial record site.

Other appropriate methods may be used to estimate low-flow if approved by the permitting agency.

APPROPRIATE SEASONAL TEMPERATURE

The OWQS require that allowable loadings to meet dissolved oxygen criteria be calculated using the seven-day, two-year low flow and the appropriate seasonal temperature. The values for the appropriate seasonal temperature are given in the OWQS as a seasonal temperature associated with a particular fishery class, applicable season date, and associated DO criteria. However, the use of an appropriate seasonal temperature other than the one specified may be allowed where site-specific data of sufficient quantity and quality are available.

In those cases where sufficient site-specific data is available, the appropriate seasonal temperature should be calculated as the upper 90th percentile value of the average daily temperatures for the season.

If sufficient continuous data are not available to develop low-flow, high-temperature frequency curves, then low-flow, high-temperature characteristics may be estimated by relating this data to nearby continuous-record sites. The partial-record site must have enough flow and temperature measurements to establish a correlation between it and a continuous-record (index) station. An index station must represent a specific area of the State with respect to topographic and geologic conditions that may have an effect on low flow and temperature and have no major regulation or other manmade changes in the drainage basin. Also, an index station must have the same period of record as the partial-record site. An attempt should be made to use streams of relatively small drainage area to avoid incorporating many varied topographic and geologic factors into one record. The index site should be less intermittent than any partial record site.

Other appropriate methods may be used to estimate an appropriate seasonal temperature if approved by the permitting agency.

WATER QUALITY-BASED LIMIT DEVELOPMENT

TOXICS CONTROL

The Water Quality Act of 1987 placed increased emphasis on control of toxic pollutants. As a result, considerable effort has been directed to identify discharges of concern and develop water quality based permit limits to control them.

There are two basic approaches to toxics control: chemical-specific and whole effluent. EPA regulations require the use of a strategy that integrates both approaches to control aquatic toxicity. The whole effluent toxicity approach can deal with the combined (synergistic) effect of a complex mix of toxic substances in an effluent, but the chemical specific approach cannot. Additionally, numerical criteria may not yet be included in the OWQS for some toxicants present in an effluent. On the other hand, the chemical specific approach can deal with background toxicity, where the whole effluent approach cannot. Additionally, certain chemical-specific properties, such as bioaccumulation, are not directly addressable through the whole effluent toxicity approach.

NPDES regulations at 40 CFR Part 122.44(d)(1)(i) state, "Limitations "must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which . . . are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Chemical-specific limits are established to control for violations of numerical water quality criteria. Whole effluent toxicity (WET) limits are established to control against exceedance of narrative criteria. Permits may also contain numeric limits for pollutants of concern that are derived through an interpretation of the narrative toxicity criterion, such as that described for ammonia toxicity in sections B.3.c(2) and B.3.d(2) of this chapter.

The first decision is to determine which discharges to evaluate for possible water quality impacts from toxic pollutants. Resource constraints and analytical costs preclude a detailed analysis of every discharge. Therefore, attention is focused on those direct discharges most likely to contain toxic pollutants, as follows:

- All major industrial discharges and all major municipal discharges, including those from POTWs with approved pretreatment programs or which are in the process of developing pretreatment programs in accordance with 40 CFR Part 403.

- Discharges from POTWs in non-pretreatment program cities that receive wastewater from one or more categorical industries.
- Discharges from categorical industries.
- Discharges known or suspected to contribute to instream toxicity problems.

Other discharges may also be designated on a case-by-case basis.

Toxic pollutants of concern are screened to determine whether water quality-based limitations in accordance with the procedures for reasonable potential evaluation in section B.2.b of this chapter and Chapter 2, Part III of this document. Dischargers to be evaluated will be required to submit toxic pollutant information with their permit application. This information will be required in the permit application form or through a request letter from the Executive Director. Industrial facilities will submit quantitative data in accordance with 40 CFR 122, Appendix D. Municipal facilities will submit quantitative data for pollutants listed in 40 CFR 122, Appendix J. Certain other toxic pollutant data may also be requested on a case-by-case basis.

In calculating water quality-based permit limits, the general approach given in the Technical Support Document for Water Quality- Based Toxics Control, EPA/505/2-90-001, March 1991, will be utilized for aquatic life and human health protection. This approach recognizes the variability of both effluent and receiving water pollutant levels and uses a statistical method to derive an effluent limitation that meets the requirements of the WLA derived to meet a specific water quality criterion.

STATISTICAL PERMIT LIMIT DERIVATION

The method used to translate a WLA into permit limits is dependent on the type of model, steady state or dynamic, used to develop the allocation. The WLA provides a definition of effluent quality that is necessary to meet the water quality standards of the receiving water. The variability of both the effluent and receiving stream pollutant levels must be addressed in development of the WLA. If not considered specifically in the water quality model used in development of the WLA (i.e., dynamic model) then this variability must be specifically considered in translation of the WLA into a permit limitation.

DYNAMIC MODEL ALLOCATIONS

Dynamic models use estimates of effluent variability and the variability of receiving water assimilation factors to develop effluent requirements in terms of concentration and variability. They account for the daily variations of and relationships between flow, effluent, and environmental conditions and therefore directly determine the actual probability that a water quality standards criteria exceedance will occur. Since variability is directly accounted for in a dynamic model the WLA determined by the model can usually be used directly in developing permit limits. Dynamic models, although very data- and resource-intensive, are acceptable for determining WLAs and corresponding permit limits. Their use, as appropriate, will be approved on a case-by-case basis.

STEADY STATE MODEL ALLOCATIONS

Steady state models are the most commonly used basis for developing water quality based permit limits. Development of a technically defensible water quality based permit limitation from a steady state wasteload allocation is a multi-step process. In most cases more than one water quality standards criteria applies to a particular pollutant (e.g., acute, chronic, and human health criteria). As a result, WLAs are determined for each applicable water quality criterion. Permit limits (the monthly average for aquatic-toxicity-based limits and the daily maximum for human health and raw water column-based limits) vary with the prescribed monitoring frequency. To ensure that the most protective water quality-based limit is established in the permit, the monthly average limits for all applicable criteria for a pollutant are compared and the most stringent monthly average limit is selected for that particular pollutant.

EFFLUENT VARIABILITY

Effluent quality and quantity vary over time in terms of volumes discharged and constituent concentrations. Variations occur due to a number of factors, including changes in human activity over a 24-hour period for publicly owned treatments works, changes in production cycles for industries, variation in responses of wastewater treatment systems to influent changes, variation in

treatment system performance, and changes in climate. Very few effluents remain constant over long periods of time. Even in industries that operate continuous processes, variations in the quality of raw materials and activities, such as back-washing of filters, cause peaks in effluent constituent concentrations and volumes.

If effluent data for a particular pollutant or pollutant parameter for a typical POTW are plotted against time, the daily concentration variations can be seen. This behavior can be described by constructing frequency-concentration plots of the same data. This frequency concentration plot can be described in terms of a particular type of statistical distribution. Treated effluent data, unless specific data show otherwise, usually follows a log normal distribution. This is because effluent values are non-negative and treatment efficiency at the low end of the concentration scale is limited, while effluent concentrations may vary widely at the high end of the scale, reflecting various degrees of treatment system performance and loadings. These factors combine to produce the characteristically positively skewed appearance of the lognormal curve when data are plotted in a frequency histogram.

Effluent data from any treatment system may be described using standard descriptive statistics, such as the mean concentration of the pollutant or pollutant parameters (i.e., the long-term average, LTA, and the coefficient of variation, CV). Using a statistical model, such as the log normal, an entire distribution of values can be projected from limited data, and limits can be set at a specified probability of occurrence. All permit limits, whether technology-based or water quality-based, are set at the upper bounds of acceptable performance. The purpose of a permit limit is to specify an upper bound of acceptable effluent quality. For water quality-based requirements, the limits are based on maintaining the effluent quality at a level that will comply with water quality standards, even during critical conditions in the receiving water. The requirements are determined by the WLA. The WLA dictates the required effluent quality, which defines the desired level of treatment plant performance or target LTA. Permit limits may then be derived from this targeted LTA and CV. Note that highly variable effluents require a much lower targeted LTA to meet the WLA and account for the variability that occurs in effluent concentration above the LTA.

CALCULATION OF WASTELOAD ALLOCATIONS (WLAS) AND CRITERION LONG TERM AVERAGES (LTAS)

CALCULATION OF WLA AND CRITERION LTA FOR ACUTE AND CHRONIC TOXICITY CRITERIA

WLA_A AND WLA_C FOR DISCHARGES TO STREAMS

ACUTE CRITERIA WLA

$$WLA_A = C_b + \frac{100\,(C_A - C_b)}{Q_e}, \text{ where } Q_e \text{ is expressed in cfs.} \quad (32)$$

$$WLA_A = C_b + \frac{64.63\,(C_A - C_b)}{Q_e}, \text{ where } Q_e \text{ is expressed in MGD.} \quad (33)$$

CHRONIC CRITERIA WLA

$$WLA_C = C_b + \frac{(1+Q^*)\,(C_C - C_b)}{(1.94\,Q^*)}, \text{ where } Q^* \le 0.1823. \quad (34)$$

$$WLA_C = C_b + (6.17 - 15.51\,Q^*)(C_C - C_b), \quad (35)$$

where $0.1823 < Q^* < 0.3333$.

$$WLA_C = C_C, \text{ where } Q^* \ge 0.3333. \quad (36)$$

WLA_A AND WLA_C FOR DISCHARGES TO LAKES

The chronic WLA is calculated if a chronic criterion applies. An acute WLA is used only in the absence of a chronic criterion.

$$WLA_{C,A} = C_b + \frac{20.15\,(C_{C,A} - C_b)}{D}, \qquad (37)$$

where the discharge is by pipe of diameter D in feet (3 ft minimum).

$$WLA_{C,A} = C_b + \frac{4.2\,(C_{C,A} - C_b)}{\sqrt{W}}, \qquad (38)$$

where the discharge is by canal of width W in feet (3 ft minimum).

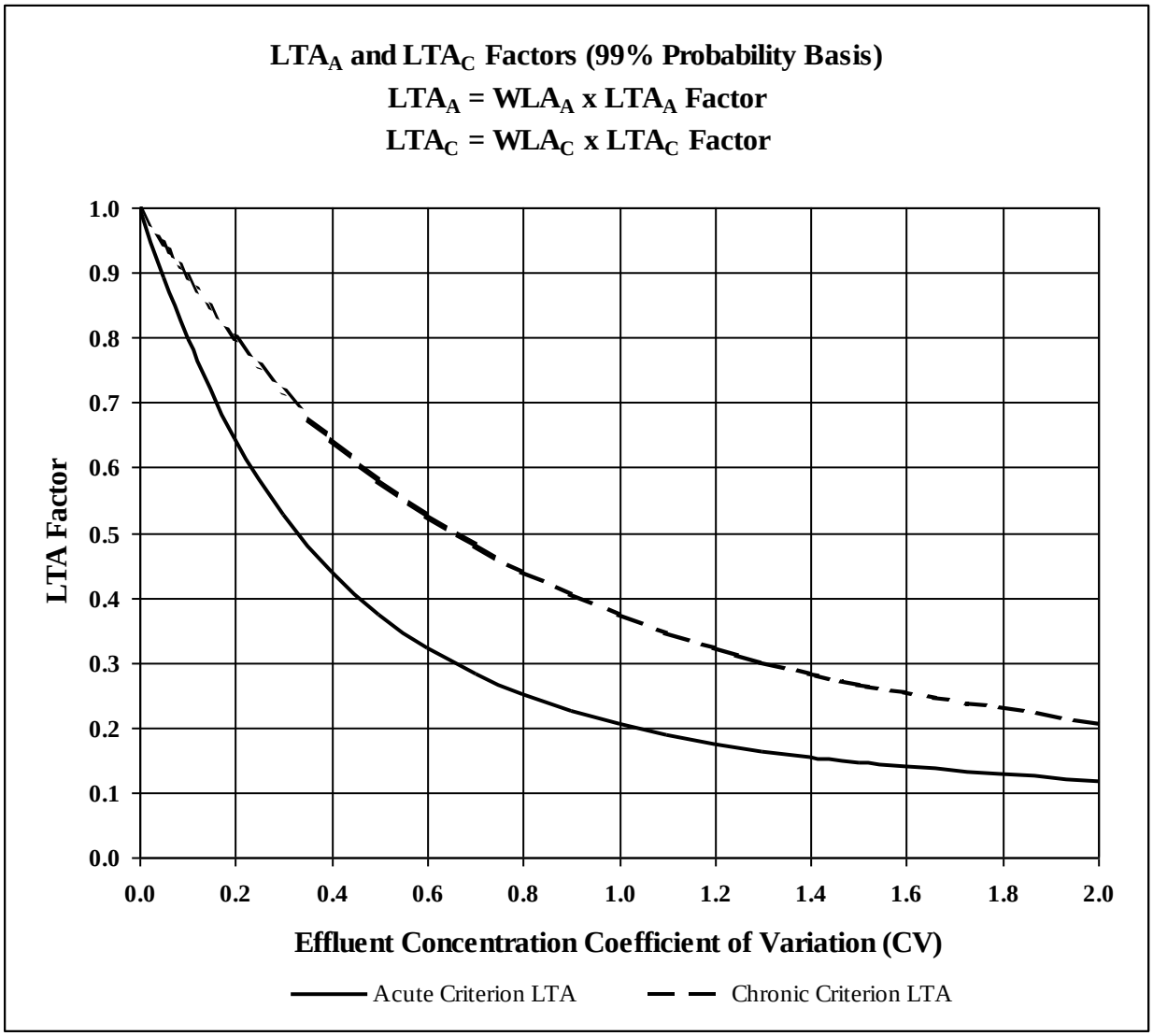
LTA_A AND LTA_C

Aquatic toxicity criterion LTAs are calculated on a 99% probability basis. Whether the receiving water is a stream or lake, toxicity criterion LTAs are calculated in the same fashion. LTA_{TOX} is the more stringent of the two (acute or chronic) toxicity LTAs.

$$LTA_A = WLA_A \times EXP\left(0.5 \ln\left(1 + CV^2\right) - 2.326\sqrt{\ln\left(1 + CV^2\right)}\right) \qquad (39)$$

$$LTA_C = WLA_C \times EXP\left(0.5 \ln\left(1 + \frac{CV^2}{4}\right) - 2.326\sqrt{\ln\left(1 + \frac{CV^2}{4}\right)}\right), \qquad (40)$$

FIGURE 2: AQUATIC TOXICITY LTA FACTORS VS. EFFLUENT COEFFICIENT OF VARIATION



CALCULATION OF WLA AND CRITERION LTA FOR AMMONIA TOXICITY

Control of toxicity from ammonia can be a potential problem where only technology- or dissolved oxygen-based ammonia limits for ammonia are established in a permit. As a means of controlling for chronic toxicity for ammonia in such cases, DEQ, OWRB and EPA Region 6 cooperatively developed an interim ammonia toxicity control strategy in January 2001. This interim control strategy is implemented as a component of the narrative toxicity criterion (for major municipal and industrial dischargers only) until such time as ammonia toxicity criteria are officially promulgated by the OWRB in the OWQS.

A chronic toxicity-based WLA and criterion LTA is determined for major municipal POTWs which have DO-based WLAs for ammonia and for major industries which produce ammonia as a commercial product or as a by-product of their industrial processes, or which have technology-based ammonia limits or DO-based WLAs for ammonia. A zero background is assumed, and a screening threshold level (criterion) of 6 mg/L is used as the maximum concentration at the edge of the chronic mixing zone. All concentrations in the calculations are in mg/L.

WLA_{NH3}

Where $Q^* \leq 0.1823$,

$$WLA_{NH3} = C_b + \frac{(1+Q^*)\,(C_{NH3} - C_b)}{(1.94\,Q^*)}. \qquad (41)$$

Simplifying, $WLA_{NH3} = \frac{(1+Q^*)\,(6)}{(1.94\,Q^*)}$. (42)

Where $0.1823 < Q^* < 0.3333$,

$$WLA_{NH3} = C_b + (6.17 - 15.51\,Q^*)(C_{NH3} - C_b). \qquad (43)$$

Simplifying, $WLA_{NH3} = (6.17 - 15.51\,Q^*)(6)$.

Where $Q^* \geq 0.3333$,

$WLA_{NH3} = C_{NH3}$, or simply $WLA_{NH3} = 6\ mg/l$.

LTANH3

$$LTA_{NH3} = WLA_{NH3} \times EXP\left(0.5\ln\left(1+\frac{CV^2}{4}\right) - 2.326\sqrt{\ln\left(1+\frac{CV^2}{4}\right)}\right) \qquad (44)$$

CALCULATION OF WLA AND CRITERION LTA FOR HUMAN HEALTH AND RAW WATER COLUMN CRITERIA

WLA_{FF}, WLA_{FFW} AND WLA_{RAW}

$$WLA_{FF} = C_{FF} + \frac{(C_{FF} - C_b)}{Q^*} \qquad (45)$$

$$WLA_{FFW} = C_{FFW} + \frac{(C_{FFW} - C_b)}{Q^*} \qquad (46)$$

$$WLA_{RAW} = C_{RAW} + \frac{(C_{RAW} - C_b)}{Q^*} \qquad (47)$$

LTA_{FF}, LTA_{FFW} AND LTA_{RAW}

Because human health and raw water column wasteload allocations are already long term average values, their respective criterion LTAs are set equal to the respective wasteload allocations.

$$LTA_{FF} = WLA_{FF} \qquad (48)$$

$$LTA_{FFW} = WLA_{FFW} \qquad (49)$$

$$LTA_{RAW} = WLA_{RAW} \qquad (50)$$

CALCULATIONS OF WLA AND CRITERION LTA FOR AGRICULTURE CRITERIA

WLA_{YMS} AND WLA_{SS}

$$WLA_{YMS} = C_{YMS} + \frac{(C_{YMS} - C_b)}{Q^*} \quad (51)$$

$$WLA_{SS} = C_{SS} + \frac{(C_{SS} - C_b)}{Q^*} \quad (52)$$

LTAYMS AND LTASS FOR AGRICULTURE CRITERIA

WLAs for the YMS criteria are already a long term average values. Hence YMS criteria LTAs are equal to their respective WLAs.

$$LTA_{YMS} = WLA_{YMS} \quad (53)$$

However, a SS WLA is a short term average, so the SS LTA is calculated on a 99% probability basis.

$$LTA_{SS} = WLA_{SS} \times EXP\left(0.5\ln\left(1+\frac{CV^2}{4}\right) - 2.326\sqrt{\ln\left(1+\frac{CV^2}{4}\right)}\right) \quad (54)$$

LTA_{CL}, LTA_{SO4}, AND LTA_{TDS}

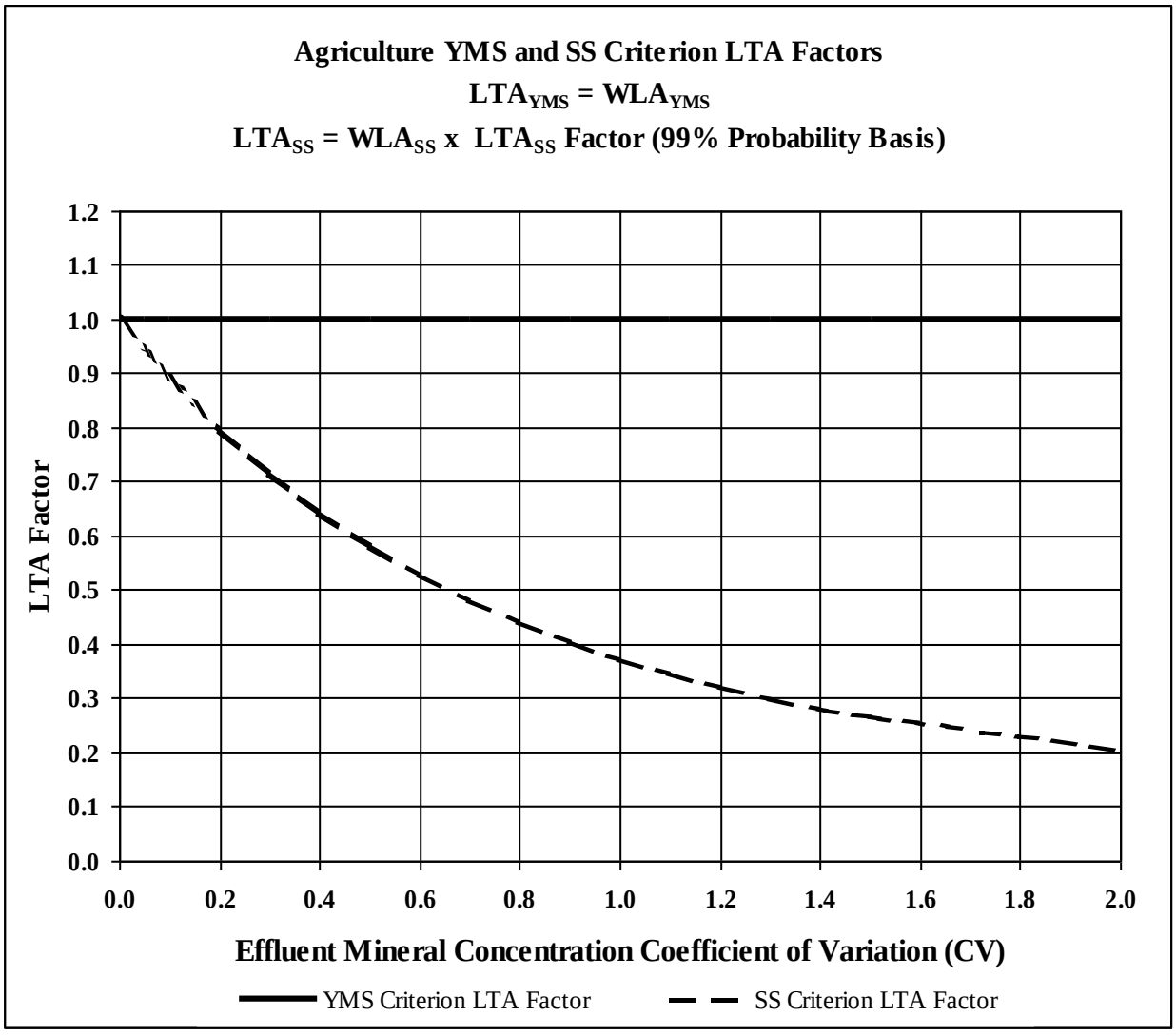
The more stringent of the YMS and SS LTAs for each mineral constituent is used to develop water quality-based permit limitations for that substance. OAC 785:45 requires that the long term average mineral constituent concentrations used to develop permit limitations be not less than 700 mg/L for TDS and not less than 250 mg/L for chlorides and sulfates. The following permit criterion LTA equations account for this minimum LTA requirement.

$$LTA_{CL} = MAX(250, MIN(LTA_{YMS}, LTA_{SS})) \textit{ for chlorides} \quad (55)$$

$$LTA_{SO4} = MAX(250, MIN(LTA_{YMS}, LTA_{SS})) \textit{ for sulfates} \quad (56)$$

$$LTA_{TDS} = MAX(700, MIN(LTA_{YMS}, LTA_{SS})) \textit{ for total dissolved solids} \quad (57)$$

FIGURE 3: AGRICULTURE CRITERIA LTA FACTORS VS. EFFLUENT COEFFICIENT OF VARIATION



CALCULATION OF WLA AND CRITERION LTA FOR TEMPERATURE CRITERIA

Trout fisheries by definition require a WLA_T of 20°C (see OAC 252:690-3-48). Other than for trout fisheries, if $\Delta T_{max} > 2.8$°C, a WLA is required.

All temperature calculations are performed in degrees Celsius (°C).

WLA_T FOR DISCHARGES TO STREAMS

$$WLA_T = T_a + \frac{1.44\,(1+Q^*)}{Q^*}, \text{ where } Q^* \le 0.1823. \quad (58)$$

$$WLA_T = T_a + 17.276 - 43.428\,Q^*, \text{ where } 0.1823 < Q^* < 0.3333. \quad (59)$$

$$WLA_T = T_a + 2.8, \text{ where } Q^* \ge 0.3333. \quad (60)$$

WLA_T FOR DISCHARGES TO LAKES

$$WLA_T = T_a + \frac{56.42}{D}, \qquad (61)$$

Where the discharge is by pipe of diameter D in feet (3 ft minimum).

$$WLA_T = T_a + \frac{11.76}{\sqrt{W}}, \qquad (62)$$

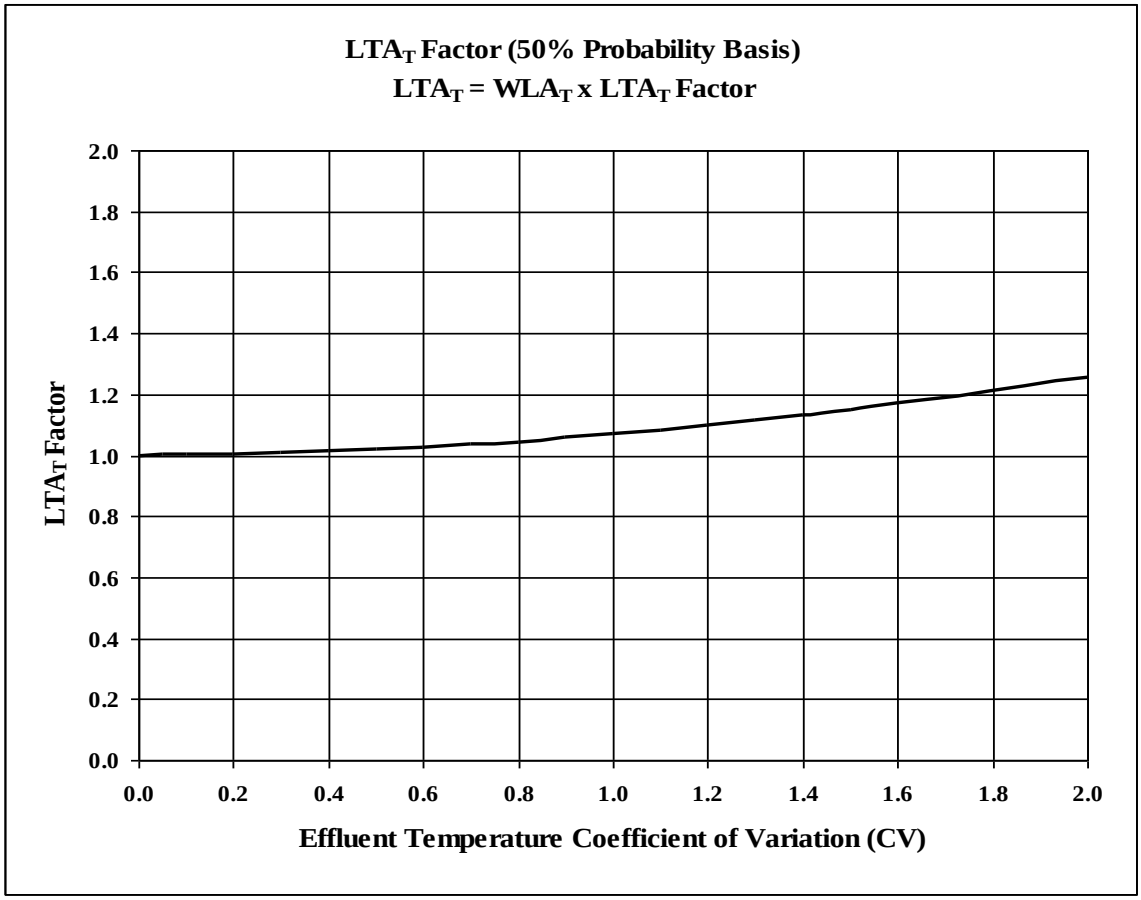
Where the discharge is by canal of width W in feet (3 ft minimum).

LTA_T (50% PROBABILITY BASIS)

Temperature criterion LTAs are calculated on a 50% probability basis.

$$LTA_T = WLA_T \times EXP\left(0.5 \ln\left(1 + \frac{CV^2}{7}\right)\right) \qquad (63)$$

FIGURE 4: TEMPERATURE LTA FACTOR VS. EFFLUENT COEFFICIENT OF VARIATION



CALCULATION OF MONTHLY AVERAGE AND DAILY MAXIMUM LIMITS FOR ACUTE AND CHRONIC TOXICITY CRITERIA

MALs and DMLs are calculated for aquatic toxicity criteria according to the following equations, where "TOX" is used as the common descriptor for both criteria. MALs are calculated on a 95% probability basis and DMLs are calculated on a 99% probability basis.

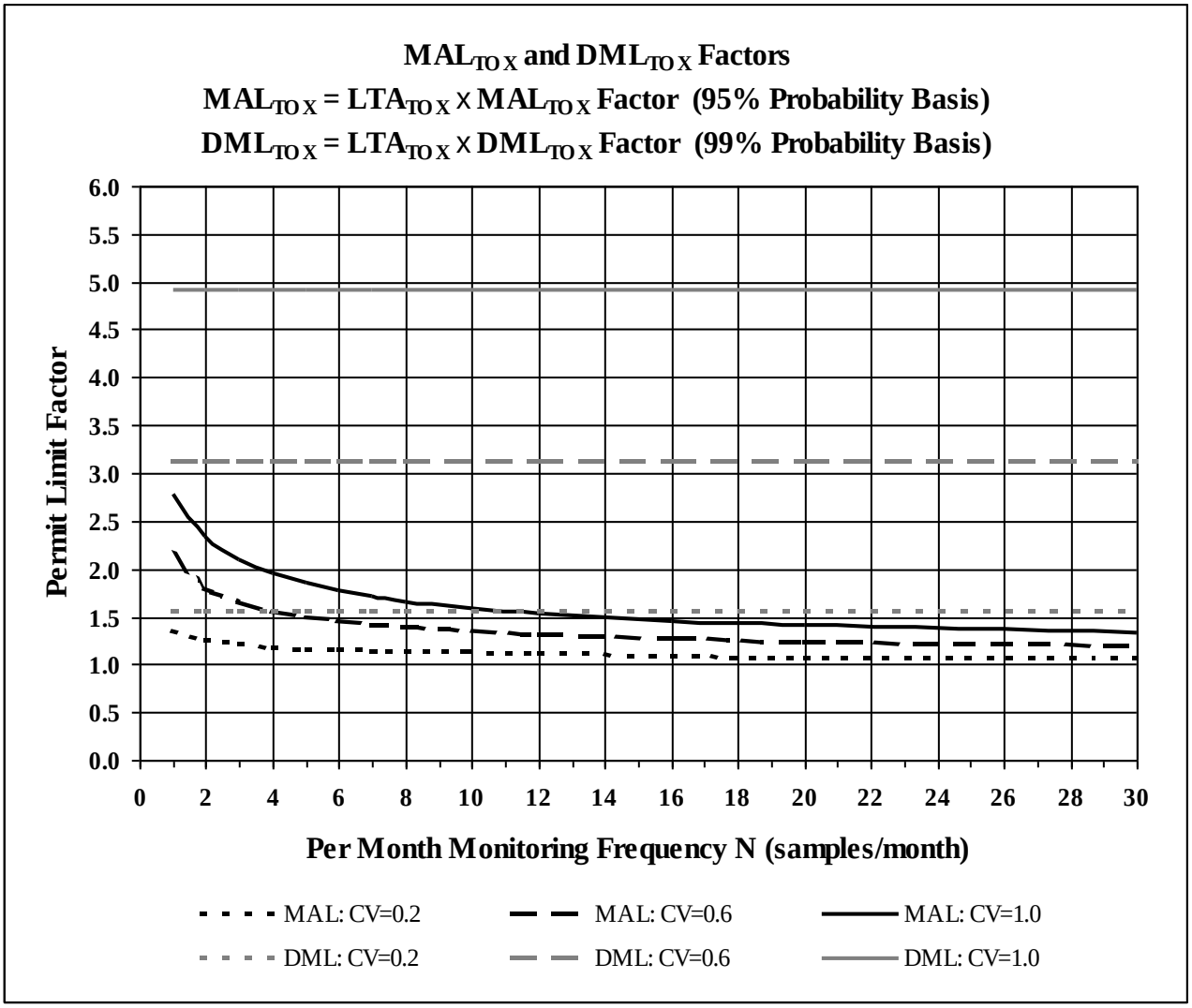
MAL_{TOX}

$$MAL_{TOX} = LTA_{TOX} \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right), \quad (65)$$

DML_{TOX}

$$DML_{TOX} = LTA_{TOX} \times EXP\left(2.326\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right), \quad (66)$$

FIGURE 5: TOXICITY-BASED MAL AND DML PERMIT LIMIT FACTORS VS. PER MONTH MONITORING FREQ N_M



CALCULATION OF MONTHLY AVERAGE AND DAILY MAXIMUM LIMITS FOR AMMONIA TOXICITY

As described in section B.3.c(2), control of toxicity from ammonia can be a potential problem where only technology- or dissolved oxygen-based ammonia limits for ammonia are established in a permit. Toxicity-based ammonia limits for use in the interim ammonia toxicity control strategy are calculated and compared with technology- and dissolved oxygen-based limits. A coefficient of variation of 0.6 is assumed, and a monitoring frequency N_m of 12/month (3/week) is required.

MAL_{NH3}

$$MAL_{NH3} = LTA_{NH3} \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right) \quad (67)$$

DML_{NH3}

$$DML_{NH3} = LTA_{NH3} \times EXP\left(2.326\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right) \quad (68)$$

COMPARISON OF TOXICITY-BASED AMMONIA LIMITS WITH DO-BASED AND TECHNOLOGY-BASED LIMITS

Where either technology- or dissolved oxygen-based ammonia limits apply, they are compared with the toxicity-based ammonia limits calculated according to (a) and (b) above. The most stringent monthly average limit and its associated weekly average or daily maximum limit, as appropriate, is established in the permit. This interim strategy will be utilized until such time as the OWRB promulgates aquatic toxicity criteria for ammonia in the OWQS.

PERFORMANCE-BASED MONITORING FREQUENCY REDUCTION FOR AMMONIA

Where a toxicity-based ammonia limit is established in a permit, a provision is included allowing the permittee to request a monitoring frequency reduction from 3/week to 1/week if the highest daily maximum level reported during the first year the toxicity-based limit is in effect is no greater than 1.5 times the monthly average permit limit.

CALCULATING OF MONTHLY AVERAGE AND DAILY MAXIMUM LIMITS FOR HUMAN HEALTH AND RAW WATER COLUMN CRITERIA

MALs and DMLs are calculated for the human health/fish flesh, human health/fish flesh and water, and raw water column criteria according to the following equations, where "HH" is used as the common descriptor for all three criteria.

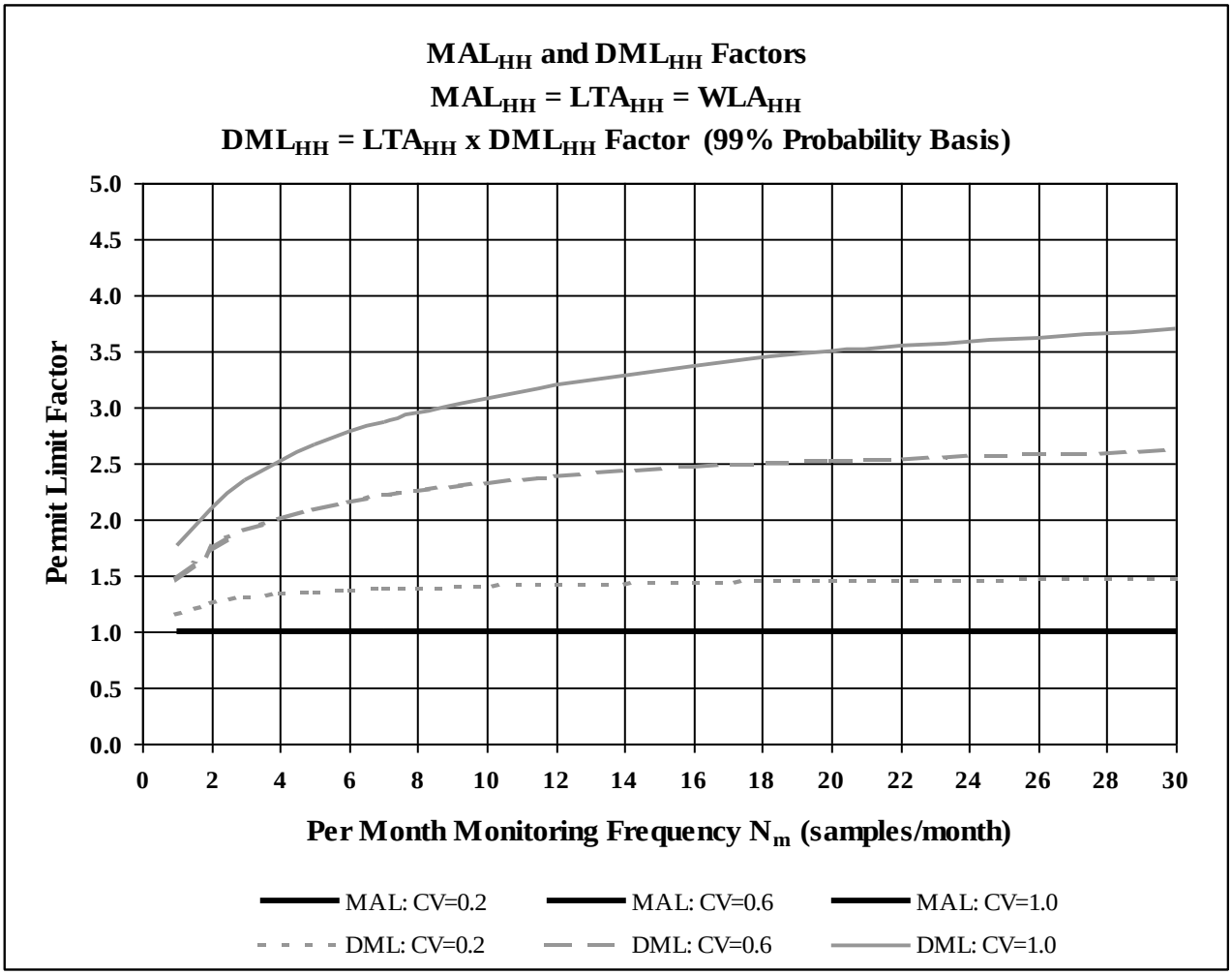
MAL_{HH} (95% PROBABILITY BASIS)

$$MAL_{HH} = LTA_{HH} \quad (69)$$

DML_{HH} (99% probability basis)

$$DML_{HH} = LTA_{HH} \times EXP\left(\frac{2.326\sqrt{\ln(1+CV^2)} - 0.5\ln(1+CV^2)}{1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)}\right) \quad (70)$$

FIGURE 6: HUMAN HEALTH-BASED MAL AND DML PERMIT FACTORS VS. PER MONTH MONITORING FREQ N_M



CALCULATION OF MONTHLY AVERAGE AND DAILY MAXIMUM LIMITS FOR AGRICULTURE CRITERIA

The more stringent of the YMS and SS LTAs for each mineral constituent is used to develop water quality-based permit limitations for that substance. OAC 785:45 requires that the long term average mineral constituent concentrations used to develop permit limitations be not less than 700 mg/L for TDS and not less than 250 mg/L for chlorides and sulfates. The following permit limit development equations account for this minimum LTA requirement. Both MALs and DMLs are calculated on a 95% probability basis.

MAL_{CL}, MAL_{SO4}, AND MAL_{TDS}

$$MAL_{CL} = LTA_{CL} \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right) \quad (71)$$

$$MAL_{SO4} = LTA_{SO4} \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right) \quad (72)$$

$$MAL_{TDS} = LTA_{TDS} \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right) \quad (73)$$

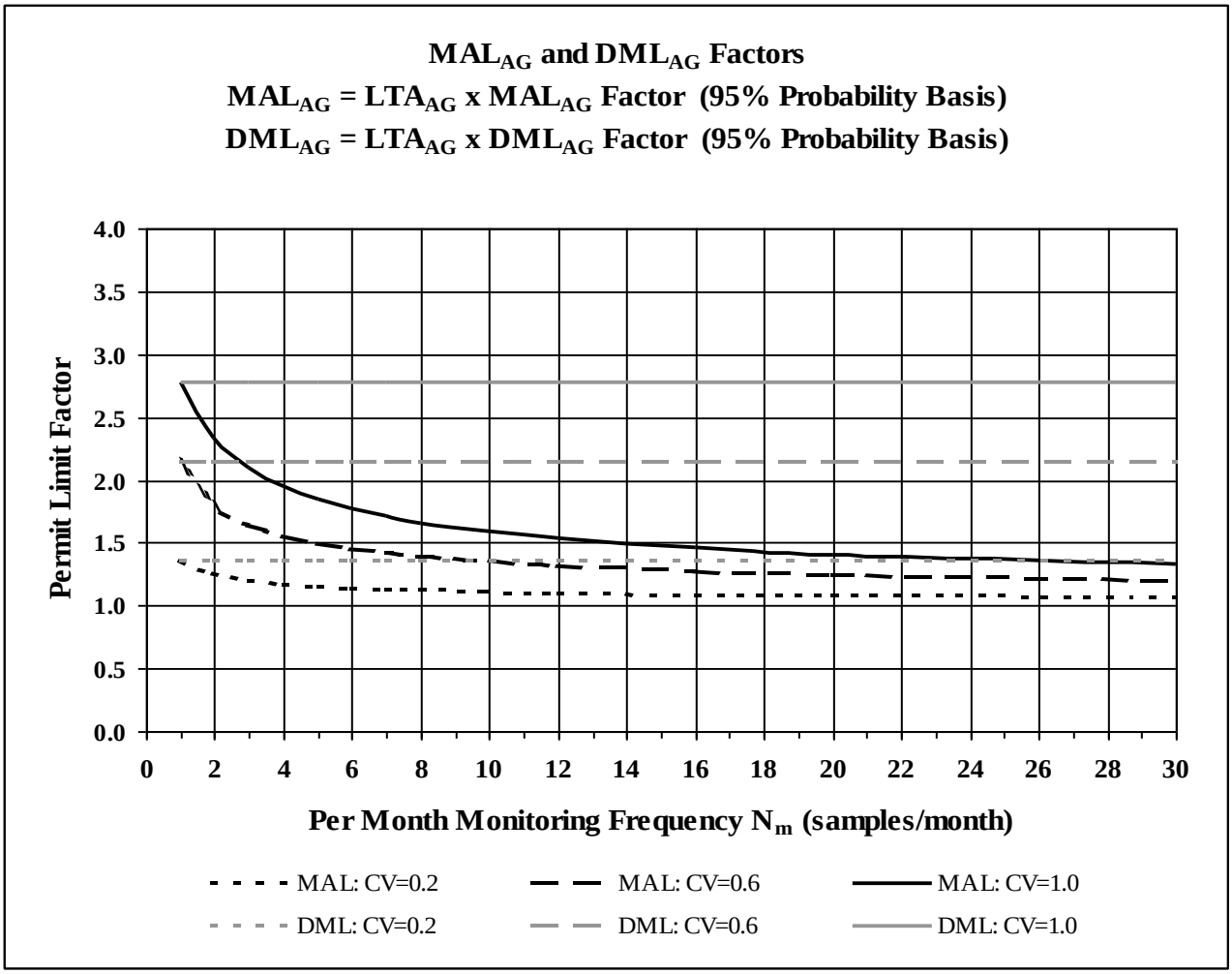
DML_{CL}, DML_{SO4}, AND DML_{TDS}

$$DML_{CL} = LTA_{CL} \times EXP\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right) \quad (74)$$

$$DML_{SO4} = LTA_{SO4} \times EXP\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right) \quad (75)$$

$$DML_{TDS} = LTA_{TDS} \times EXP\left(1.645\sqrt{\ln\left(1+CV^2\right)} - 0.5\ln\left(1+CV^2\right)\right) \quad (76)$$

FIGURE 7: AGRICULTURE MAL AND DML PERMIT LIMIT FACTORS VS. PER MONTH MONITORING FREQ N_M



CALCULATION OF MONTHLY AVERAGE, WEEKLY AVERAGE, AND DAILY MAXIMUM PERMIT LIMITS FOR TEMPERATURE

Both MALs and DMLs are calculated on a 95% probability basis.

MAL_T (95% PROBABILITY BASIS)

$$MAL_T = LTA_T \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_m}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_m}\right)\right) \quad (77)$$

If the MAL_T calculated according to the above equation exceeds 52°C, it is capped at 52°C for antidegradation purposes.

WAL_T (95% PROBABILITY BASIS).

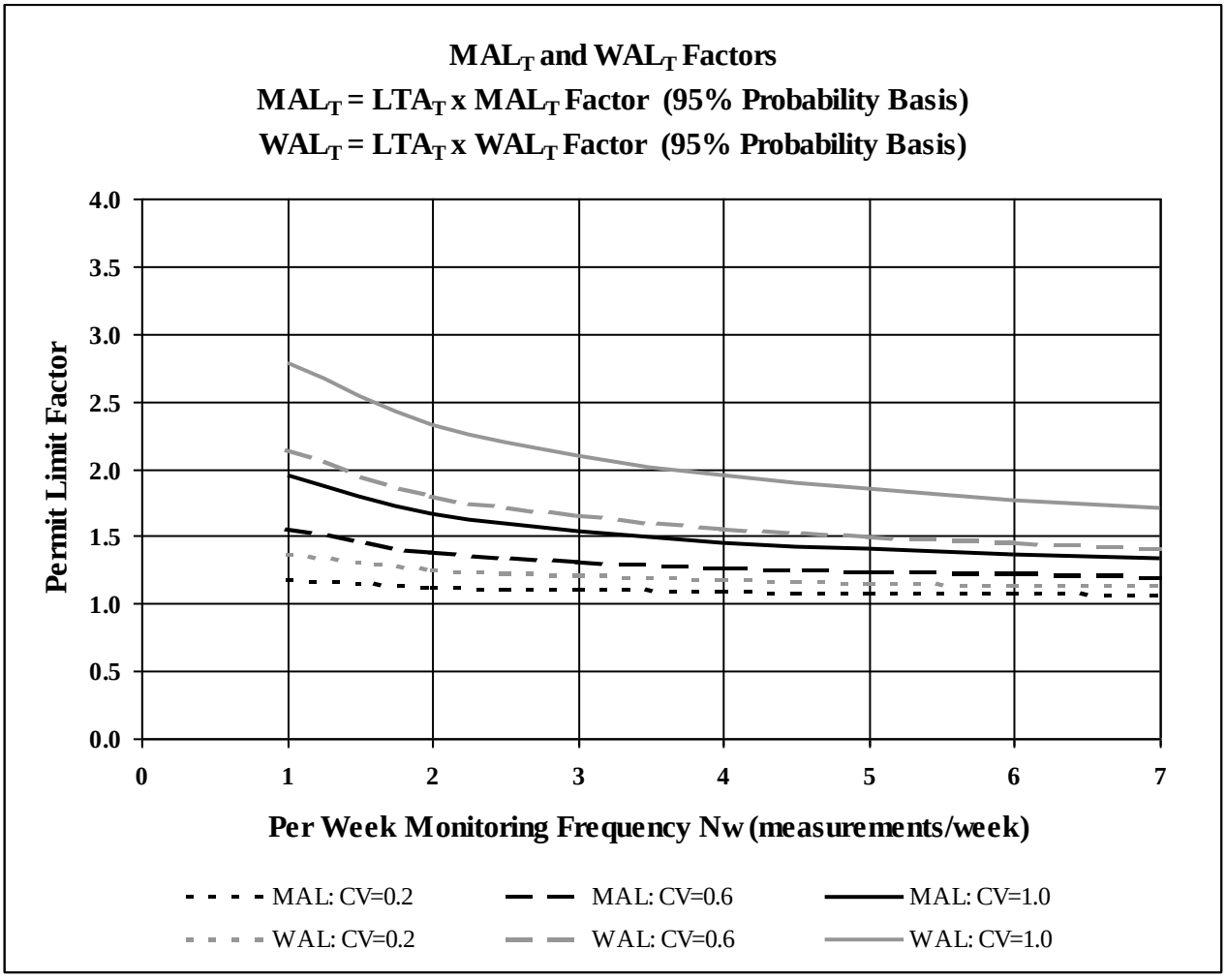
$$WAL_T = LTA_T \times EXP\left(1.645\sqrt{\ln\left(1+\frac{CV^2}{N_w}\right)} - 0.5\ln\left(1+\frac{CV^2}{N_w}\right)\right) \quad (78)$$

If the WAL_T calculated according to the above equation exceeds 52°C, it is capped at 52°C for antidegradation purposes.

DML_T

If a daily maximum limit is required for thermal antidegradation purposes, then DML_T = 52°C.

FIGURE 8: TEMPERATURE MAL AND WAL PERMIT LIMIT FACTORS VS. PER WEEK MONITORING FREQ N_W



WHOLE EFFLUENT TOXICITY LIMITS

As described in OAC 252:690-3-19 and in section B.2.b(7) of this chapter, WET limits are established in a permit when there is reasonable potential to violate the narrative_toxicity criterion. WET testing requirements (type of test required, frequency of testing, critical dilution(s) and dilution series) associated with the WET limit are further described in section B.4.a of this chapter.

Where a WET limit is required, it is normally applied to both test species, even if the toxicity of concern occurs in only one species. Since acute critical dilutions are always 100%, acute WET limits are always expressed as "$LC_{50} > 100\%$". A chronic WET limit is expressed as "$NOEC_L \geq CCD$", where $NOEC_L$ is the no observed lethal effect concentration and CCD is the chronic critical dilution. Where a WET limit is established in a permit, a WET test survival failure is considered a permit violation.

WATER QUALITY-BASED EFFLUENT MONITORING REQUIREMENTS

BIOMONITORING (WHOLE EFFLUENT TOXICITY TESTING) REQUIREMENTS

Biomonitoring requirements implementing EPA Region 6's revised post-third round WET testing frequency policy of June 30, 2000, are described in OAC 252:690-3-19, 3-27 and 3-29 through 3-43. DEQ's implementation of EPA Region 6's revised policy allows permittees which have not had a significant history of whole effluent toxicity or which do not present a significant toxicity potential (determined on a case-by-case basis) to request WET testing frequency reductions if there are no lethal WET test failures (and no sublethal WET test failures for those facilities performing chronic testing) during a "trial period" of quarterly testing for one to two years.

WET TESTING METHODS

- **Acute test/*Daphnia pulex***: Acute 48-hour static renewal toxicity test using *Daphnia pulex* as described in the Fifth Edition, EPA publication no. 821-R-02-012(October 2002), Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organisms or most recent version thereof.

- **Acute test/*Pimephales promelas* (Fathead minnow)**: Acute 48-hour static renewal toxicity test using Pimephales promelas as described in the Fifth Edition, EPA publication no. 821-R-02-012(October 2002), Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organisms or most recent version thereof.

- **Chronic test/*Ceriodaphnia dubia***: Chronic static renewal 7 day survival and reproduction test using Ceriodaphnia dubia (Method 1002.0), as described in the Fourth Edition, 821-R-02-013 (October 2002), Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms or most recent version thereof.

- **Chronic test/*Pimephales promelas* (Fathead minnow)**: Chronic static renewal 7 day larval survival and growth test using *Pimephales promelas* (fathead minnow) (Method 1000.0), as described in Fourth Edition, EPA publication no. 821-R-02-013 (October 2002), Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms or most recent version thereof.

- **Acute test/*D.Magna.*** Acute 48-hour static renewal toxicity test using *Daphnia magna* (Method 2021.0), as described in EPA Publication No. 821-R-02-012 (October, 2002), fifth edition, *Methods for Measuring the Acute Toxicity Of Effluent to Freshwater and Marine Organisms.*

- **Chronic test/*D.Magna.*** Chronic 21-day static renewal life-cycle toxicity test using *Daphnia magna*, (ASTM Designation E-1193), as described in ASTM Publication E-1193-97 (Reapproved 2004), *Standard Guide for Conducting Daphnia Magna Life Cycle Toxicity Tests.*

- **Acute test/Mussels.** Acute toxicity test using mussels (ASTM Designation E-2455) as described in ASTM Publication E-2455-06 (Approved April, 2006), *Standard Guide for Conducting Laboratory Toxicity Test with Freshwater Mussels.*

APPLICABILITY AND TYPE OF WET TEST REQUIRED

WET testing is required for all major dischargers and those minor dischargers identified by DEQ as posing a significant unaddressed toxic risk. Q* is calculated as described in Appendix D. The following WET testing requirements apply:

- **Acute testing only**. Acute testing only is required for all discharges to lakes and where Q* < 0.054 in streams.
- **Chronic testing only**. Chronic testing only is required where Q* > 0.3333 in streams.
- **Acute and chronic testing**. Both acute and chronic testing are required where 0.054 ≤Q* ≤ 0.3333 in streams.

CRITICAL DILUTIONS

The acute critical dilution (ACD) is always 100% effluent. The chronic critical dilution (CCD) is expressed in percent effluent is a function of the value of Q* and is calculated according to the following equations:

$$CCD = 100 \times \frac{1.94\,Q^*}{(1+Q^*)}, \text{ where } Q^* \le 0.1823 \quad (79)$$

$$CCD = 100 \times \frac{1}{(6.17 - 15.51\,Q^*)}, \text{ where } 0.1823 < Q^* < 0.3333 \quad (80)$$

$$CCD = 100, \text{ where } Q^* \ge 0.3333 \quad (81)$$

WET TEST DILUTION SERIES

All WET testing utilizes a 0.75 dilution series as described in Table 3 and Table 4. Because of the criteria for selection of the type of WET test required, the lowest possible CCD is 10%, corresponding to a Q* value of 0.054. At values of Q* <0.054, only acute testing is required. At CCDs between 75% and 95%, an additional 100% effluent dilution is added to the series in order to bracket the critical dilution. Bracketing is considered unnecessary at CCDs above 95%.

TABLE 3: 0.75 DILUTION SERIES FOR CRITICAL DILUTIONS FROM 10% THROUGH 75%

Percent Effluent					
Dilution 1	**Dilution 2**	**Dilution 3**	**Dilution 4** (Critical Dil)	**Dilution 5**	**Dilution 6**
4.2	5.6	7.5	10	13	---
4.6	6.2	8.3	11	15	---
5.1	6.8	9.0	12	16	---
5.6	7.5	10	13	17	---
5.9	7.9	11	14	19	---
6.3	8.4	11	15	20	---
6.8	9.0	12	16	21	---
7.2	9.6	13	17	23	---
7.6	10	14	18	24	---
8.0	11	14	19	25	---
8.4	11	15	20	27	---
9.0	12	16	21	28	---
9.3	12	17	22	29	---
9.7	13	17	23	31	---
10	14	18	24	32	---
11	14	19	25	33	---
11	15	20	26	35	---
11	15	20	27	36	---
12	16	21	28	37	---

Percent Effluent					
Dilution 1	**Dilution 2**	**Dilution 3**	**Dilution 4** (Critical Dil)	**Dilution 5**	**Dilution 6**
12	16	22	29	39	---
13	17	23	30	40	---
13	17	23	31	41	---
14	18	24	32	43	---
14	19	25	33	44	---
14	19	26	34	45	---
15	20	26	35	47	---
15	20	27	36	48	---
16	21	28	37	49	---
16	21	29	38	51	---
16	22	29	39	52	---
17	23	30	40	53	---
17	23	31	41	55	---
18	24	32	42	56	---
18	24	32	43	57	---
19	25	33	44	59	---
19	25	34	45	60	---
19	26	35	46	61	---
20	26	35	47	63	---
20	27	36	48	64	---
21	28	37	49	65	---
21	28	38	50	67	---
22	29	38	51	68	---
22	29	39	52	69	---
22	30	40	53	71	---
23	30	41	54	72	---
23	31	41	55	73	---
24	32	42	56	75	---
24	32	43	57	76	---
24	33	44	58	77	---
25	33	44	59	79	---
25	34	45	60	80	---
26	34	46	61	81	---
26	35	47	62	83	---
27	35	47	63	84	---
27	36	48	64	85	---
27	37	49	65	87	---
28	37	50	66	88	---
28	38	50	67	89	---
29	38	51	68	91	---
29	39	52	69	92	---
30	39	53	70	93	---
30	40	53	71	95	---

Percent Effluent					
Dilution 1	**Dilution 2**	**Dilution 3**	**Dilution 4** (Critical Dil)	**Dilution 5**	**Dilution 6**
30	41	54	72	96	---
31	41	55	73	97	---
31	42	56	74	99	---
32	42	56	75	100	---

TABLE 4: 0.75 DILUTION SERIES FOR CRITICAL DILUTIONS FROM ABOVE 75%

Percent Effluent					
Dilution 1	**Dilution 2**	**Dilution 3**	**Dilution 4**	**Dilution 5** (Critical Dil)	**Dilution 6**
24	32	43	57	76	100
24	32	43	58	77	100
25	33	44	59	78	100
25	33	44	59	79	100
25	34	45	60	80	100
26	34	46	61	81	100
26	35	46	62	82	100
26	35	47	62	83	100
27	35	47	63	84	100
27	36	48	64	85	100
27	36	48	65	86	100
28	37	49	65	87	100
28	37	50	66	88	100
28	38	50	67	89	100
28	38	51	68	90	100
29	38	51	68	91	100
29	39	52	69	92	100
29	39	52	70	93	100
30	40	53	71	94	100
30	40	53	71	95	100
30	41	54	72	96	---
31	41	55	73	97	---
31	41	55	74	98	---
31	42	56	74	99	---
32	42	56	75	100	---

WET TESTING ENDPOINT AND TEST FAILURE CRITERIA

ACUTE TESTS

The endpoint for acute WET testing is the LC_{50}.

Acute test failure is greater than or equal to 50% mortality to a test species in any of the effluent dilutions after 48 hours. Statistical analysis must be consistent with the methods described in the documents referenced in OAC 252:690-3-29 & 39.

CHRONIC TESTS

LETHAL EFFECT (SURVIVAL)

The endpoint for lethality for routine chronic WET testing and retesting is the $NOEC_L$. Chronic lethal effect test failure is a statistically significant difference at the 95% confidence level between survival of the test organisms in an effluent dilution at or below the CCD after 7 or 8 days and the control. Statistical analysis must be consistent with the methods described in the documents referenced in OAC 252:690-3-29 & 41(1). Where a WET limit is established, it is expressed as an $NOEC_L$ and must be greater than or equal to the CCD.

SUBLETHAL EFFECTS

The endpoint for sublethality for routine chronic WET testing and retesting is the $NOEC_S$. Chronic sublethal effect test failure is a statistically significant difference at the 95% confidence level between reproduction in the *C. dubia* test or larval growth in the Fathead minnow test in an effluent dilution at or below the CCD after three broods or 7 or 8 days, and the control. Statistical analysis must be consistent with the methods described in the documents referenced in OAC 252:690-3-29 & 40(2).

TEST FAILURE NOTIFICATION AND RETESTING

Permittees must notify DEQ by telephone within 24 hours and in writing within five days of becoming aware of a WET test failure and must perform WET retests on the affected test species.

If a permit contains a WET limit, monthly WET ~~re~~tests of the same type as the failed test are required until the permittee achieves three consecutive passing ~~re~~tests, at which time the permittee returns to the routine WET testing frequency.

If a permit does not contain a WET limit, two monthly WET retests of the same type as the failed test are required during the two-month period following the month in which the test failure is experienced. The first retest must be initiated no sooner than 20 days and no longer than 40 days past the initial test failure If the routine testing frequency is monthly, a retest may be used to fulfill a routine testing requirement only if a routine test would have been required for that month. If the routine testing frequency is other than monthly, neither of the retests may be substituted for routine WET testing.

Retests required as a result of acute test failure only are not required to include chronic retesting. Similarly, retests required as a result of chronic test failure only are not required to include acute retesting.

CONCURRENT CHEMICAL-SPECIFIC SAMPLING AND ANALYSIS

DEQ may require concurrent chemical-specific analyses on samples collected for WET testing purposes where there is reason to believe substances may cause or contribute to whole effluent toxicity. Permittees must submit the results of concurrent chemical-specific testing with the WET test report. Permittees must collect sufficient sample volumes for the testing laboratory to perform concurrent chemical-specific testing in addition to the WET testing.

TOXICITY REDUCTION EVALUATIONS/TOXICITY IDENTIFICATION EVALUATIONS (TRES/TIES)

Where the permittee has demonstrated intermittent lethality in either acute or chronic WET testing, DEQ will require an increase in the frequency of WET testing and may require the permittee to perform a TRE/TIE for the affected species. A WET limit, chemical-specific numerical limit, or toxicity-specific management practices may be required at the completion of a TRE/TIE if DEQ determines it is warranted.

WET TEST DILUTION WATER

For discharges where there is no receiving water available when the sample is collected, permittees must use synthetic dilution water having a pH, hardness, and alkalinity similar to that of the closest downstream perennial water.

For discharges to perennial streams, permittees must use receiving water collected as close to the point of discharge as possible but unaffected by the discharge. Receiving water must be collected

outside the regulatory mixing zone for discharges to lakes. If the receiving water control fails to fulfill the test acceptability criteria in OAC 252:690-3-38, the permittee must substitute synthetic dilution water for the receiving water in all subsequent tests, provided:

- A synthetic dilution water control which fulfills the test acceptability requirements in OAC 252:690-3-38 was run concurrently with the receiving water control.
- The test indicating receiving water toxicity was carried out to completion.
- The synthetic dilution water had a pH, hardness and alkalinity similar to that of the receiving water, provided the magnitude of these three parameters did not cause toxicity in the synthetic dilution water.

WET TESTING FREQUENCY

All biomonitoring permits require quarterly WET testing at least during the first year of renewed permit. New permits require quarterly WET testing for the life of the permit

Monitoring frequency reductions may be granted in accordance with OAC 252:690-3-42 after completion of a trial period as described in OAC 252:690-3-41(b).

TRIAL PERIOD

The length of the WET testing trial period will be established by DEQ based on whether and to what degree a facility poses an increased toxicity risk due to the nature of its activities (e.g., accepting external waste streams, a history of WET test failures, or reported discharges of toxic compounds in toxic amounts). The minimum WET testing trial period is one year. The length of the WET testing trial period will be specified in the permit. If DEQ determines that an increased toxicity risk so warrants, quarterly or more frequent testing may be required for the life of the permit.

WET TESTING FREQUENCY REDUCTIONS

Permittees may request reduction of the WET testing frequency for the remaining term of the permit depending on the results of WET testing during the WET testing trial period. To qualify for a WET testing frequency reduction, the permittee must certify that tests submitted in fulfillment of its WET testing requirements during the WET testing trial period meet all test acceptability criteria set forth in OAC 252:690-3-38 and EPA WET test method documents. In addition the following apply:

APPROVAL OF CERTIFICATION

DEQ will either approve or deny the certification in writing within 90 days of receipt. DEQ may deny the certification based on facility specific criteria if it finds that any of the permittee's WET test reports during the period for which certification is submitted:

- Are substantively incomplete,
- Are in error regarding test acceptability criteria or statistical interpretation of results; or
- Were not received by DEQ by the due date prescribed in the permit.

TEST FAILURE DEMONSTRATED DURING THE WET TESTING TRIAL PERIOD

If a lethal test failure is demonstrated at any time during the WET testing trial period, the permittee must continue testing at a frequency of once per quarter for the affected species for the remaining life of the permit upon completion of the WET testing trial period. DEQ may reduce the testing frequency for the species not affected, if applicable, to not less than twice per year for the remaining term of the permit, provided the permittee submits the certification prescribed in OAC 252:690-3-42(2) for the unaffected species.

POLLUTANT-SPECIFIC EFFLUENT MONITORING REQUIREMENTS

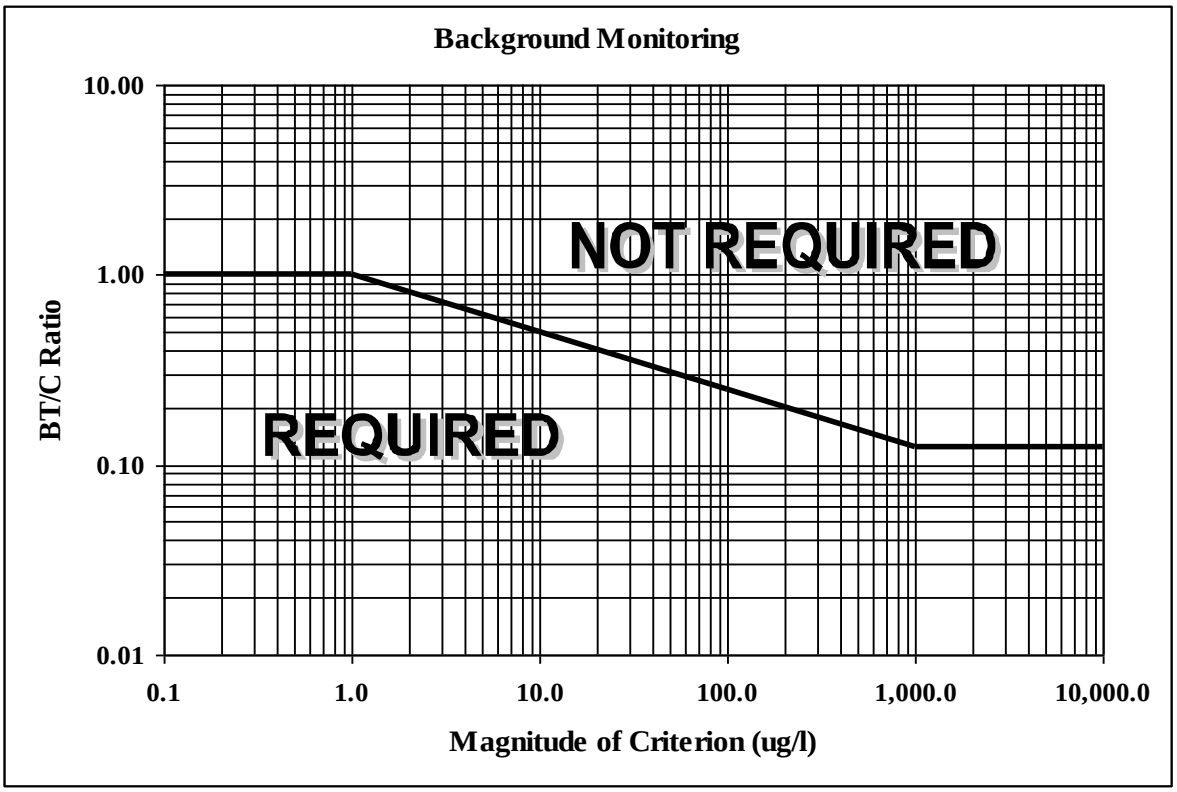
Should reasonable potential to exceed an applicable water quality criterion be exhibited using $C_{95(M)}$ (refer to section B.2.b(3)(b)(i)), an effluent monitoring requirement for that pollutant is established in the permit in accordance with OAC 252:690-3-90 such that at least 10 data points are obtained within a 12 month time frame. The permit must also require that the laboratory reports for such effluent samples be submitted to DEQ at the conclusion of the monitoring period.

WATER QUALITY-BASED BACKGROUND MONITORING REQUIREMENTS

Background monitoring requirements are described at OAC 252:690-3-10 through 3-16. The BT/C (background trigger/criterion) ratio is used to determine if background monitoring is justified where effluent limits are not established for a substance and a complete background data set is not available. The background trigger for an applicable numerical criterion is defined as the background concentration in a specific discharge situation necessary to trigger reasonable potential for a substance given a specified mean effluent concentration. Where the BT/C ratio is less than 1.0, C_{95} exceeds the associated water quality criterion, indicating that reasonable potential could be exhibited were the background level high enough. If the BT/C ratio is less than or equal to a certain threshold concentration, called $(BT/C)_{max}$, which is determined using equation J1, J2, or J3 of OAC 252:690 Appendix J, background monitoring is required. This need occur (i.e., where BT/C ratio $\leq (BT/C)_{max}$) for only one applicable criterion to require the background monitoring. The background monitoring frequency must be sufficient to provide at least 10 data points over a period of one year.

The value of the $(BT/C)_{max}$ threshold decreases as the magnitude of a criterion increases. In this manner, background monitoring is more likely to be required for pollutants with criteria of very low magnitude, where knowledge of the background level is more critical in the reasonable potential screening process. This relationship is illustrated in Figure 9.

FIGURE 9: $(BT/C)_{MAX}$ THRESHOLD FOR BACKGROUND MONITORING



Background samples in streams must be collected at a point away from the stream bank, as close as is feasible to the channel, immediately upstream of the point of discharge, but not affected by it. Background samples in lakes must be collected at a point away from the waters edge and outside the regulatory mixing zone.

EXPRESSING WATER QUALITY-BASED EFFLUENT LIMITATIONS

Limits must be expressed clearly in the permit so that they clearly are enforceable and unambiguous. All limits, both chemical specific and whole effluent, should appear in the permit.

MASS-BASED EFFLUENT LIMITS

Mass-based effluent limits are required by NPDES regulations at 40 CFR 122.45(f). The regulation requires that all pollutants limited in NPDES permits have limits, standards, or prohibitions expressed in terms of mass with three exceptions, including one for pollutants that cannot be expressed appropriately by mass. Examples of such pollutants are pH, temperature, radiation, and whole effluent toxicity. Mass limitations in terms of pounds per day can be calculated for all chemical-specific toxics such as arsenic or chromium. Mass-based limits should be calculated using concentration limits at the highest montly average flow, $Q_{e(30)}$. This is done as:

Daily Max Concentration Limit $\times$ $Q_{e(30)}$ $\times$ 8.34 = Daily Max Mass Loading Limit, and

Monthly Avg Concentration Limit $\times$ $Q_{e(30)}$ $\times$ 8.34 = Monthly Avg Mass Loading Limit,

where concentration is expressed in mg/L, flow in MGD and mass loading in lb/day.

CONCENTRATION-BASED EFFLUENT LIMITS

Mass-based effluent limits alone may not assure attainment of water quality standards in water with low dilution. In these waters, the quantity of effluent discharged has a strong effect on the instream dilution and the instream pollutant concentration. In this situation, it is the effluent concentration rather than the effluent mass discharge that dictates the instream concentration. In addition, concentration is a most often a readily apparent measure of treatment performance. Including concentration limits encourages the proper operation of the treatment facility at all times.

In some instances, the use of concentration limits may be counter-productive since they may discourage the use of innovative techniques such as water conservation. If a facility has a history of providing efficient treatment of its wastewater and also wishes to practice water conservation, inclusion of concentration limits would probably not be appropriate. Flow reductions and their associated energy savings should be encouraged where appropriate by allowing water quality-based permit limits to be mass-based and by allowing concentration based limits to vary in accordance with flow reduction requirements.

Therefore, effluent limitations should usually be expressed in terms of both concentration and mass loading. Concentration-based limits may be waived if a discharger can demonstrate, on a site-specific basis, that concentration-based limits are not appropriate and that sufficient dilution exists to provide an adequate margin of safety to protect the WLA.

DETECTION LEVEL LIMITS

Where water quality-based limits are calculated which are below the MQL for that particular pollutant, a level of compliance will be established in the permit based upon the MQL. The calculated water quality-based limit will be placed in the permit and if any analytical test result for that pollutant is less than the MQL a value of zero may be used for monitoring report calculations and reporting requirements, provided that the analytical detection level is reported in the comments section of the DMR. If a pollutant is of particular concern (i.e., if the pollutant has a high bioconcentration factor) the permittee may also be required to develop an effluent specific method detection limit. Additional requirements such as fish tissue collection and analyses, limits and/or monitoring requirements on internal waste streams, and limits and/or monitoring for surrogate parameters may also be required in the permit.

EFFLUENT MONITORING FREQUENCY

A minimum of two samples per month is required for those pollutants for which water quality-based limits are developed from acute toxicity, chronic toxicity, human health or raw water column criteria. However, a number of factors must be considered in establishing monitoring frequency. These factors include:

- The type of treatment process, including retention time.
- Environmental significance and nature of the pollutant or pollutant parameter.
- Cost of monitoring relative to the discharger's capabilities and benefit obtained.
- Compliance history.

- Number of monthly samples used in developing the permit limit.
- Effluent variability.

Therefore, monitoring frequency is usually determined on a case specific basis for each discharger. For municipal dischargers, a minimum frequency of testing for conventional pollutants is based on the requirements listed in the following tables taken from OAC 252:606, Appendix A.

TABLE 5: DISCHARGING LAGOONS

Parameters & Sample Site	DESIGN CAPACITY (MGD)					
	0 < 0.1	0.1 < 0.5	0.5 < 1.0	1.0 < 5.0	5.0 < 10.0	≥10.0
pH each cell & effluent	2/wk	2/wk	2/wk	2/wk	2/wk	2/wk
D.O. each cell & effluent	2/wk	2/wk	2/wk	2/wk	2/wk	2/wk
Alkalinity each cell & effluent	2/wk	2/wk	2/wk	2/wk	2/wk	2/wk
Temperature each cell & effluent	2/wk	2/wk	2/wk	2/wk	2/wk	2/wk
Flow effluent	2/wk Instantaneous	5/wk Instantaneous	7/wk Totalized	7/wk Totalized	7/wk Totalized	7/wk Totalized
BOD5 influent & effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
TSS effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
Appearance of effluent	2/wk	2/wk	2/wk	2/wk	2/wk	2/wk

TABLE 6: TRICKLING FILTER PLANTS

Parameters & Sample Site	DESIGN CAPACITY (MGD)					
	0 < 0.1	0.1 < 0.5	0.5 < 1.0	1.0 < 5.0	5.0 < 10.0	≥10.0
pH each influent & effluent	Daily	Daily	Daily	Daily	Daily	Daily
D.O. effluent	Daily	Daily	Daily	Daily	Daily	Daily
Temperature effluent	Daily	Daily	Daily	Daily	Daily	Daily
Settlement solids influent	Daily	Daily	Daily	Daily	Daily	Daily
Flow	Daily	Daily	Daily	Daily	Daily	Daily
BOD_5 influent & effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
TSS influent & effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
Chlorine Residual (only if Cl is added as part of treatment)	Daily	Daily	Daily	Daily	Daily	Daily

TABLE 7: ACTIVATED SLUDGE FACILITIES

(including extended aeration, oxidation ditches, and sequential batch reactors)

Parameters & Sample Site	DESIGN CAPACITY (MGD)					
	0 < 0.1	**0.1 < 0.5**	**0.5 < 1.0**	**1.0 < 5.0**	**5.0 < 10.0**	**≥10.0**
pH influent & effluent	Daily	Daily	Daily	Daily	Daily	Daily
D.O. effluent	Daily	Daily	Daily	Daily	Daily	Daily
Temperature effluent	Daily	Daily	Daily	Daily	Daily	Daily
Settleable Solids influent	Daily	Daily	Daily	Daily	Daily	Daily
Flow	Daily	Daily	Daily	Daily	Daily	Daily
BOD_5: influent & effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
TSS influent & effluent	1/mo grab	2/mo grab	3/mo 3 hr comp	1/wk 6 hr comp	5/wk 12 hr comp	7/wk 12 hr comp
BOD_5 and TSS effluent for SBR Process	1/mo single composite SBR sample	2/mo single composite SBR sample	3/mo single composite SBR sample	1/wk 2-cycle composite SBR sample	5/wk 3-cycle composite SBR sample	7/wk 3-cycle composite SBR sample
Chlorine residual (if Cl added as part of treatment)	Daily	Daily	Daily	Daily	Daily	Daily
30-minute settleability mixed liquor	Daily	Daily	Daily	Daily	Daily	Daily
Sludge volume index	2/wk	2/wk	3/wk	3/wk	5/wk	7/wk
D.O. aeration basins	2/wk	2/wk	3/wk	3/wk	5/wk	7/wk
Waste activated sludge control tests: Select 1, 2, or 3 below 1. Food/Mass 2. Mean Cell 3. Sludge age	as to necessary control operation		3/wk	3/wk	3/wk	3/wk

TABLE 8: AEROBIC DIGESTERS

Parameters & Sample Site	DESIGN CAPACITY (MGD)					
	0 < 0.1	**0.1 < 0.5**	**0.5 < 1.0**	**1.0 < 5.0**	**5.0 < 10.0**	**≥10.0**
D.O. basin contents	2/wk	2/wk	3/wk	5/wk	7/wk	7/wk
pH basin contents	2/wk	2/wk	3/wk	5/wk	7/wk	7/wk
% Volatile suspended solids destruction	None	None	None	None	3/wk	3/wk
% Solids	None	None	None	when drawn	when drawn	when drawn

TABLE 9: ANAEROBIC DIGESTERS

Parameters & Sample Site	DESIGN CAPACITY (MGD)					
	0 < 0.1	0.1 < 0.5	0.5 < 1.0	1.0 < 5.0	5.0 < 10.0	≥10.0
pH	1/wk	1/wk	3/wk	5/wk	7/wk	7/wk
Temperature	1/wk	1/wk	3/wk	5/wk	7/wk	7/wk
Volatile acids	when drawn	when drawn	2/wk	3/wk	3/wk	3/wk
Total alkalinity	when drawn	when drawn	2/wk	3/wk	3/wk	3/wk
% Volatile suspended solids	None	None	None	None	3/wk	3/wk
% Solids	None	None	None	when drawn	when drawn	when drawn

PERFORMANCE-BASED MONITORING REDUCTIONS

NPDES authorities can grant relief to regulated facilities that have a record of good compliance and pollutant discharges at levels below permit requirements. This relief provides incentives for voluntary reductions of pollutant discharges through such means as reuse and recycling. The approach outlined below is based on EPA's "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies" (April 1996). It applies to both major and minor individual NPDES permits for direct discharges, and will be implemented through the existing NPDES permitting cycle for facilities.

TIMING OF DECISIONS

Monitoring reductions will be considered during permit reissuance. Reductions based on facility performance may also be considered if the permit is reopened to accommodate other issues. DEQ may modify the permit solely to reduce monitoring requirements if sufficient resources are available.

ENTRY CRITERIA FOR PARTICIPATION

FACILITY ENFORCEMENT HISTORY

CRIMINAL ACTIONS (ALL ENVIRONMENTAL STATUTES)

Facilities which have been criminally convicted under any federal or state environmental statute of falsifying monitoring data or committing violations, which presented an imminent and substantial endangerment to public health or welfare are permanently ineligible for performance-based monitoring frequency reductions. The sole exception shall be that, whenever the permit writer, on a case-by-case basis, determines that there has been a wholesale change in ownership and management, that facility may become eligible for consideration under this guidance as a new permittee. Facilities convicted of any other criminal violation under federal or state environmental statute will not receive any reductions for five years. Reductions will be available for those facilities where an individual employed by the permittee, but not the permittee itself, was convicted of a criminal violation under any federal or state statute, provided the permittee discovered and self-disclosed the violation, and took prompt action to correct the root cause in order to prevent future criminal violations.

CIVIL JUDICIAL ACTIONS (CWA/NPDES/OPDES RELATED)

Facilities are eligible for consideration of reductions one year after completion of injunctive relief and payment of penalty.

ADMINISTRATIVE ACTIONS (CWA/NPDES/OPDES RELATED)

Facilities are eligible for consideration after the permittee has complied with Administrative Penalty Order (APO) or Administrative Order (AO) requirements, and payment of any assessed penalty. A permittee that is issued an AO, in conjunction with reissuance of its permit, to extend a compliance schedule, may be eligible if the permittee is in compliance with the interim milestones and schedule in the AO.

For example, in order to comply with a newly promulgated effluent guideline, an industrial sector may be required to install a new technology. Some facilities may not be able to attain the new technology immediately so an AO is issued at the time the facility's permit is reissued. The AO sets a compliance schedule to allow the permittee additional time to install the technology needed to meet the new effluent guideline limitation.

PARAMETER-BY-PARAMETER COMPLIANCE

DEQ will examine each of the following entry criteria:

SIGNIFICANT NONCOMPLIANCE FOR PARAMETERS UNDER CONSIDERATION

A facility may not have had any Significant Noncompliance (SNC) violations for the parameters for which monitoring/reporting reductions are being considered during the last two years.

ANY EFFLUENT VIOLATIONS OF SELECTED PARAMETERS

A facility may not have had any effluent violations of selected (critical) pollutants during the last year. These critical pollutants are permit-specific and are determined at DEQ's discretion. Typical of such pollutants – would be those, which are highly toxic or bioaccumulative.

PARAMETER-BY-PARAMETER PERFORMANCE HISTORY

At a minimum, the two most recent years of monthly average effluent data representative of current operating conditions for the parameter at the particular outfall will be used to calculate the long-term average discharge rate for use in Table 10 and Table 11.

The baseline frequencies in Table 10 and 11 will normally be considered the level of monitoring in the existing effective NPDES permit. It is important to recognize that permittees that receive monitoring frequency reductions in accordance with Table 10 or Table 11 are still expected to take all appropriate measures to control both the average level of pollutants of concern in their discharge as well as the variability of such parameters in the discharge, regardless of any reductions in monitoring frequencies granted from the baseline levels. Reliance on monitoring the discharge at a reduced frequency as the sole means of tracking and controlling the discharge could increase the risk of violations. Monitoring frequency reductions for facilities with one or more permit violations (short of significant noncompliance and) for the parameter under consideration (which may not be a "critical" parameter) over the two-year period of record are found in Table 10. Monitoring frequency reductions for facilities with no permit violations over the two-year period of record are found in Table 11.

New permittees should go through one permit cycle (5 years) before being eligible for consideration for reduced monitoring. Facilities would not normally be considered for reductions in monitoring frequencies below once per quarter, except in unusual circumstances of highly reliable performance at the requisite levels and outstanding compliance/enforcement histories.

Ideally, parameters, which are candidates for monitoring frequency reductions should demonstrate a coefficient of variation (ratio of standard deviation to arithmetic average) of 20% or less. An additional safeguard should stipulate that parameters, which showed any exceedance of the monthly average limitation during the two-year averaging period should not be eligible for monitoring frequency reductions. It should be noted that discharges with a long-term average at or near the permit limit have a probability of reporting a violation approximately 50% of the time, regardless of low coefficient of variation or sample size.

MASS LOADING-EQUIVALENT CONCENTRATIONS

If a permit contains a monthly average mass loading limit, but not a monthly average concentration limit, the equivalent monthly average concentration limit may be derived from the monthly average mass loading limit and the flow basis (the high 30-day average flow during the two year period of record for industrial facilities and the design flow for municipal facilities). Performance-based monitoring frequency reductions shall not be based on a weekly average, a daily minimum or a daily maximum concentration limit.

TABLE 10: PERFORMANCE BASED MONITORING FREQUENCY REDUCTIONS WITH PERMIT VIOLATIONS

(One or More Permit Violations During Two Year Period of Record Not Resulting in Significant Noncompliance)

Baseline Monitoring Frequency (previous permit)	**Ratio (Percent) of Long-term Average Effluent Concentration for Two Year Period of Record to Monthly Average Concentration Limit** [a]				
	< 25%	≥25% and <50%	≥50% and <65%	≥65% and <75%	≥75%
7/week (daily)	3/week	4/week	5/week	6/week	NR
6/week	3/week	4/week	4/week	5/week	NR
5/week	3/week	3/week	4/week	NR	NR
4/week	2/week	3/week	NR	NR	NR
3/week	2/week	2/week	NR	NR	NR
2/week	1/week	NR	NR	NR	NR
1/week	2/month	NR	NR	NR	NR
2/month	NR	NR	NR	NR	NR
1/month	NR	NR	NR	NR	NR

[a] NR means "no reduction"

TABLE 11: PERFORMANCE BASED MONITORING FREQUENCY REDUCTIONS WITHOUT PERMIT VIOLATIONS

(No Permit Violations During Two Year Period Of Record)

Baseline Monitoring Frequency (previous permit)	**Ratio (Percent) of Long-term Average Effluent Concentration for Two Year Period of Record to Monthly Average Concentration Limit** [a]				
	< 25%	≥25% and <50%	≥50% and <65%	≥65% and <75%	≥75%
7/week (daily)	2/week	3/week	4/week	5/week	6/week
6/week	2/week	3/week	3/week	4/week	5/week
5/week	1/week	2/week	3/week	4/week	4/week
4/week	1/week	2/week	2/week	3/week	NR
3/week	1/week	2/week	2/week	NR	NR
2/week	2/month	1/week	1/week	NR	NR
1/week	1/month	2/month	NR	NR	NR
2/month	1/month	NR	NR	NR	NR
1/month	1/2 months	NR	NR	NR	NR
1/2 months	NR	NR	NR	NR	NR

[a] NR means "no reduction."

RESIDENCY CRITERIA FOR CONTINUED PARTICIPATION

Permittees are expected to maintain the performance levels that were used as the basis for granting monitoring reductions. To remain eligible for these reductions, the permittee may not have any SNC violations for effluent limitations of the parameters for which reductions have been granted or failure to submit DMRs, or may not be subject to a new formal enforcement action. For facilities that do not maintain performance levels, the permitting authority may require increased monitoring in accordance with a Section 308 or 309 Order (or State equivalent).

SPECIAL CONSIDERATIONS

DISCONTINUOUS DATA

Monitoring should not be reduced using the methodology described above if effluent data have not been continuously reported over the period of time being considered. Effluent averages from interrupted or discontinuous data sets may not be representative of long-term performance. Monitoring frequencies for discharges that are intermittent or short-term, such as seasonal discharges and highly variable batch processes, should not be assessed or reduced using the methods described above and would need to be considered on a case-by-case basis.

INDEPENDENT/DEPENDENT CONTROL PARAMETERS

The procedures for reductions described in this guidance are intended for effluent parameters, which are normally independently controlled by the permittee. That is, for each parameter limited in the permit there should be significantly different control mechanisms/factors—either in the permittee's treatment, pretreatment or process operations. In situations where there are several parameters, each of which could be used to measure the performance of a given system, it will generally be appropriate to primarily monitor only the best indicator parameter. For example, if a biological treatment system can be evaluated by BOD, CBOD, COD, or TOC measurements, it would normally be appropriate to require monitoring of only one of these oxygen demanding parameters.

The permitting authority should, therefore, examine the parameters being monitored from each facility during the permit issuance process to establish which parameters are independently controlled and/or which can be used to determine the proper operation of a facility. Monitoring of other parameters can be either eliminated or reduced to a minimum frequency.

MONITORING FREQUENCY "FLOOR"

Current federal NPDES regulations do not establish a monitoring frequency "floor" but do establish a reporting frequency floor of once per year. The monitoring frequency from which reductions could be made is considered to be the level of the monitoring in the existing effective NPDES permit. It is important to recognize that the guidance given in Table 11 does not advocate any reductions in statistical confidence in the ability of a permitting authority to determine whether or not a permit limit is being violated at reduced monitoring frequencies. The guidance also does not advocate any reductions for parameters that are currently monitored only once per quarter.

The permitting authority may, however, consider other factors specific to the State or facility. For example, a State policy may establish the baseline. If a facility has already been given monitoring reductions due to superior performance, the baseline may be a previous permit. As a point of reference, federal regulations do not stipulate minimum monitoring frequencies but do require that reporting cannot be less than once per year. Future guidance may also be used to establish a baseline for monitoring.

EXCEPTIONS

The permitting authority may elect to maintain higher monitoring levels in individual situations where there may be a particular interest in human health, endangered species or a sensitive aquatic environment. An example would be where a permitting authority has assessed water quality problems in a watershed and determined which point and nonpoint

sources are particularly critical from the standpoint of protection of aquatic resources (e.g., endangered species) and human health (e.g., drinking water source). The permitting authority may well decide not to reduce monitoring of critical point sources in these instances, while continuing to monitor the overall situation.

APPLICABILITY TO MINOR FACILITIES

Minor facilities are fully eligible for reductions under this guidance, even though they are not automatically tracked for SNC in the Permits Compliance System database. (Avoidance of SNC is one of the minimum criteria that should be met for participation in this program.) However, permitting authorities may apply the SNC criteria on a case-by-case basis to minor facilities in order to allow them to participate in this program based on permit-specific effluent compliance.

LIMITS BELOW LEVELS OF DETECTION

Reductions in monitoring frequencies are not recommended in cases where stringent water quality-based limits are below levels of quantification (the level at which a constituent present in a wastewater sample can be reliably detected and quantified). Permittees with these types of limits will normally be deemed to be in compliance when monitored levels are below the level of quantification; however, by definition, it is not scientifically possible (until analytical methods improve) to certify that the water quality based limits are actually being achieved. However, the permitting authority may still use its discretion in considering reductions on a case-by-case basis.

USE OF DAILY MAXIMUM VALUES

This guidance does not provide a specific methodology for considering daily maximum permit values when considering monitoring/reporting reductions. However, EPA is in the process of implementing a revised definition of SNC that accounts for daily maximum violations. The new definition will be included in the entry criteria of this guidance at a later date. In the interim, permitting authorities should consider such situations on a case-by-case basis. There may be concerns over instances where, for example, there are acutely toxic conditions in a receiving water due to violations of daily maximum permit limitations. In such cases, the permitting authority may elect to maintain higher monitoring levels. In addition, it is important to recognize that dischargers who frequently violate daily maximum permit limitations will likely be unable to achieve high levels of performance in monthly average limits and effectively would not be eligible to participate in this program on that basis. In addition, such facilities may also trigger one of the various compliance/enforcement-based entry criteria.

THE TMDL PROCESS

The Total Maximum Daily Load (TMDL) process provides a reasonable, technically sound, and consistent procedure for measuring and managing the impact of point and non-point source discharges on the quality of Oklahoma waterbodies. State water quality standards (WQS) serve as the benchmark from which to measure these impacts. Recommended reductions in pollutant loadings developed as part of the TMDL process serve as a framework within which the various State agencies can work to ensure that both point and non-point source discharges do not contribute to violations of water quality standards.

Water quality standards include three elements: designated beneficial uses, narrative or numerical criteria (physical, chemical, and biological) to protect the designated beneficial uses, and an antidegradation policy. Waters identified as not meeting any one of these components of water quality standards require the development and implementation of water-quality based point and non-point source pollution control measures.

Before The TMDL Process begins, a modeling Quality Assurance Project Plan (QAPP) will be developed and submitted to EPA for review and approval before starting modeling work for each EPA funded TMDL/WLA project.

The TMDL process begins by determining which waters do not meet, or are not expected to meet, water quality standards after the implementation of technology-based controls. Waters identified through this process are considered impaired and must be prioritized so that an overall management plan can be developed to reduce the excess pollutants. Then, the quantity and quality of pollutant sources is determined. Once quantified, reductions for point source and non-point sources that are protective of water quality standards are determined. After these reductions are implemented, a follow-up assessment is made to determine their effectiveness.

THE TMDL OBJECTIVE

The objective of a TMDL is to achieve water quality standards by allocating allowable loads and implementing appropriate control actions on the various pollutant sources.

The first step in developing a TMDL involves establishing a goal, or target, which is usually related to achieving a particular numerical or narrative water quality criterion. Because of the complexity of the WQS, this goal may be specific to a particular pollutant or may involve a number of pollutants. In addition, this goal may be set differently depending on the type of waterbody. Multiple targets are appropriate in cases where different requirements must be applied to different points in the waterbody or where differing requirements are associated with multiple uses. A phased approach can be appropriate in some cases.

ASSESSMENT OF EXISTING CONDITIONS

WATER QUALITY

The first step in assessing the current conditions is to gather available data and information on the water body. At a minimum, obtain the water quality data (if available) that was used for listing the water body. When Federal funds are committed to a project then a quality assurance project plan (QAPP) will be developed for all data collection activities.

EXISTING DATA

The sufficiency and adequacy of existing data will be evaluated and described. DEQ will consider data to be sufficient and adequate when the data accurately characterize the conditions of the water body, watershed, pollutant, and pollutant sources throughout typical geographic and temporal conditions with reasonable certainty.

DATA REQUIREMENTS

Some TMDL projects will require additional watershed information relating to particular water quality conditions, as existing data alone may be insufficient to support the analytical needs of TMDL projects. Data on low-flow conditions, storm-flow conditions, and seasonal variations should be gathered when appropriate to the situation.

POLLUTANT LOAD

Before pollutant loads are allocated among sources, the location and types of sources, and the current and projected pollutant load for each source will be identified. Data needed for pollutant source analysis include:

CURRENT LOADING

Source contributions will be established by measuring pollutant loads directly, calculating or estimating loads from water quality and flow data, estimating loads with mathematical models, or using a combination of these methods.

POLLUTANT SOURCE(S) ANALYSIS

Before pollutant loads are allocated among sources, the location and types of sources, and the current and projected pollutant load (flow, concentration, permit limits) for each source must be identified. Examples of data needed for pollutant source analysis include:

- Watershed and sub watershed boundaries
- Hydrologic interaction between surface water and groundwater

- Locations of stream segments
- Locations of pollutant sources
- Types of pollutant sources
- Anticipated growth of discharges
- Meteorological/rainfall data and runoff coefficients
- Land uses and land cover
- Soil types

DIFFERENTIATE POINT AND NONPOINT SOURCES

An inventory will be developed of all known factors in the watershed, which influence water quality. These factors might include permitted industrial and municipal wastewater discharges, concentrated animal feeding operations (CAFOs), waste application sites, cropland, forestry operations, industrial stormwater, urban runoff, construction activities, and other sources such as natural background. This information will be collected and maintained by sub watershed where possible to enhance the identification of cause-and-effect relationships. The watershed inventory will be compiled from land-use data, special investigations, DEQ complaint investigations, DEQ permit databases, surface water monitoring data, and watershed stakeholder input.

MAXIMUM ALLOWABLE LOADING NECESSARY TO MEET WATER QUALITY STANDARDS

A water body's loading capacity is an estimate of the maximum amount of pollutant loading the water body considering critical conditions (i.e. flow, temperature, etc.) can receive over time without exceeding water quality standards. Hydrological, biological, chemical, and pollutant fate and transport data are required to calculate a water body's loading capacity. The maximum loading capacities of a waterbody will be determined, in most cases, using a water quality model(s) developed specifically for the waterbody in question. The model used will be selected on a case-by-case basis and based on available resources, the identified pollutant source(s) and the availability of historical water quality data.

ALLOCATION OF LOADINGS

ALLOCATION CONSIDERATIONS

The following factors must be considered and incorporated when developing a loading, unless it is demonstrated that one or more of these factors is not relevant to the particular load allocation:

FUTURE GROWTH

Future growth (such as new sources and source expansion) will be considered when allocating pollutant loads. Loading allocations that will be implemented to achieve water quality standards in the future must account for foreseeable increases in pollutant loading. All anticipated increases in loading should be included in models or other analyses that project water quality responses or conditions into the relatively distant future.

FLOW AND LOAD VARIATIONS

Variability in hydrology and effluent discharge needs to be considered in allocating pollutant loads. The pollutant load and concentration can vary depending on a number of factors, including rainfall and normal seasonal variations.

TEMPORAL VARIATIONS

The period of time over which a total load will be evaluated for the purposes of TMDL loading allocation is a function of hydrologic and seasonal variations in pollutant loads. Determination of an appropriate time frame should focus on watershed conditions, including water quality, hydrology, source locations, and climatic patterns.

ANTIBACKSLIDING

When evaluating loading allocation alternatives, consideration must be given to the constraints imposed by the CWA antibacksliding requirements. These requirements generally prohibit reissuing an OPDES permit with less-stringent technology-based effluent limits than those contained in an

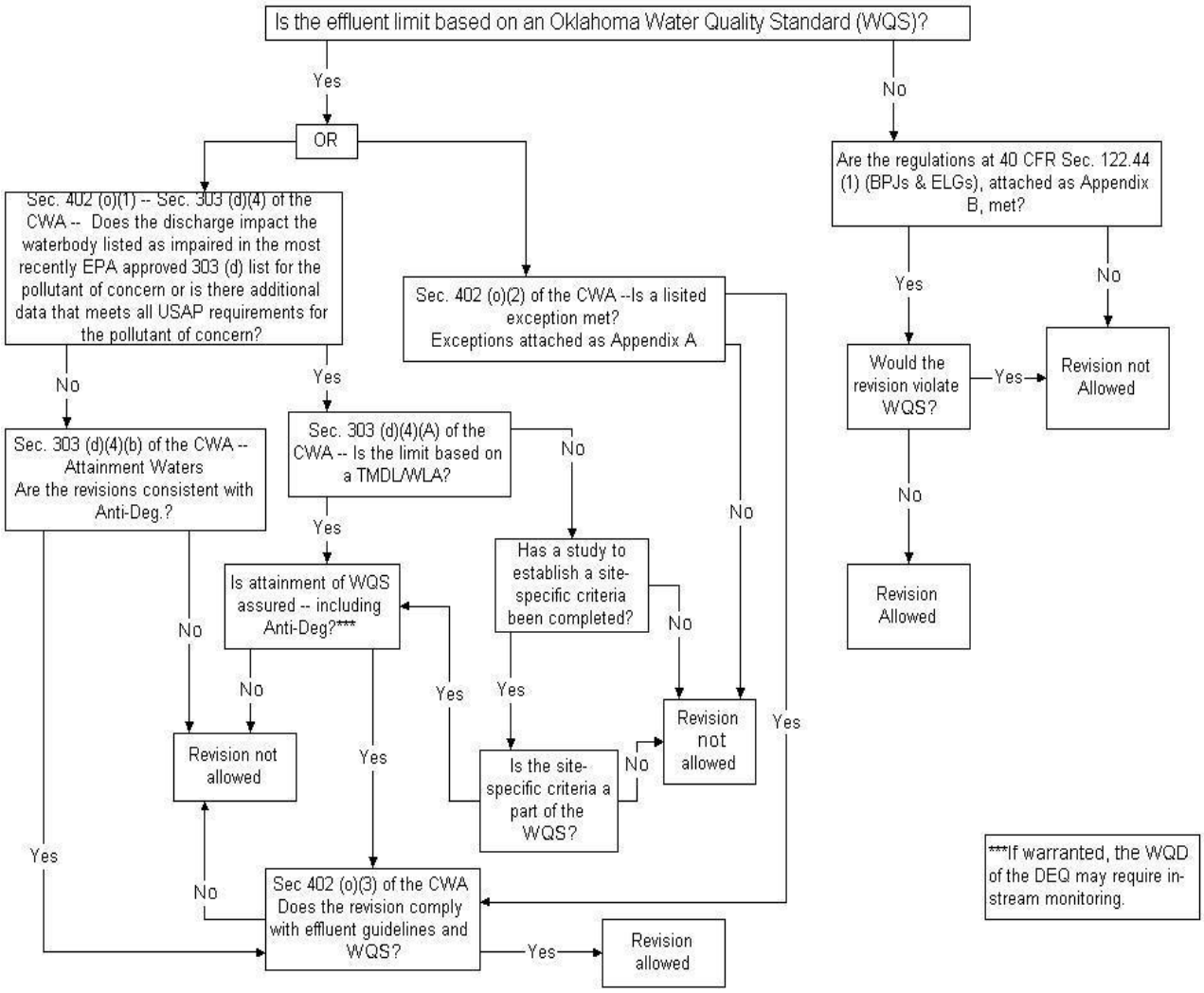
existing permit. Note that a technology-based permit condition cannot be overridden with a less stringent TMDL condition.

The DEQ policy regarding antibacksliding is summarized here and shown in the flowchart (Figure 10). This policy will be used whenever DEQ is considering a less stringent permit limit or is requested by a permittee to make an effluent limit less stringent. An effluent limitation cannot be made less stringent in the following situations:

- The permit limit is a technology based effluent limit derived from an ELG.
- The permittee previously demonstrated reasonable potential (RP), but currently does not demonstrate RP due to treatment.

In these cases, the effluent limit will not change, but the sampling frequency for the effluent limit may change.

FIGURE 10: ANTIBACKSLIDING FLOWCHART



ANTIDEGRADATION

The antidegradation policy in the Oklahoma Water Quality Standards prohibits an increase in loading that would impair or further impair an existing use. In addition, the policy prohibits degradation of outstanding resource waters and high-quality waters, even if designated uses would still be attained. Loading allocations must be consistent with these provisions.

POLLUTANT SOURCES AND SOURCE CATEGORIES

The pollutant load inventory developed during the assessment phase will be further refined to establish a list of pollutant sources and source categories to be used is the load allocation process.

POLLUTION ALLOCATION SCHEMES

Three common methods for allocating loads (equal percent removal, equal effluent concentrations, and a hybrid method) are discussed below. Other methods will be considered if necessary.

EQUAL PERCENT REMOVAL

Equal percent removal exists in two forms. In one, the overall removal efficiencies of the sources are set so they are all equal. In the latter, the incremental removal efficiencies beyond the current discharge are equal.

EQUAL EFFLUENT CONCENTRATION

This is similar to equal percent removal if influent concentrations at all sources are approximately the same.

HYBRID METHOD

With this method, the criteria for waste reduction may not be the same from one source to the next. One source may be allowed to operate unchanged while another may be required to provide the entire load reduction. More generally, a proportionality rule may be assigned that requires the percent removal to be proportional to the input source loading or flow rate.

OTHER METHODS

Any other method contained in EPA guidance. DEQ shall approve the use of the method on a case-by-case basis.

ALLOCATION TRADEOFFS

Where appropriate and technically feasible, tradeoffs among wasteload allocations will be considered. Technological feasibility, economic issues, and regulatory authority will be evaluated when trading allocations. Pollutant trades are acceptable so long as water quality standards (including antidegradation regulations and policies) and minimum applicable technology-based controls are met.

MARGIN OF SAFETY

The margin of safety (MOS) is the prescribed mechanism to account for the uncertainty associated with TMDL projects. The MOS can be included in more than one of the TMDL analytical steps. To represent the MOS conservative assumptions should be used to complete one or more of these steps:

- Derive numeric water quality targets
- Determine pollutant sources
- Represent pollutant fate and transport relationships
- Determine the degree of pollutant reduction achievable through management measures and control actions

LOADING CAPACITY AND ALLOCATIONS

The TMDL loading allocation process culminates in allocating pollutant loads among various point, nonpoint, natural background sources, and margin of safety. The equation and recommendations listed below will be used to develop and evaluate TMDL loading allocations.

LC = WLA + LA + MOS where:

LOADING CAPACITY (LC) is the maximum amount of pollutant loading a water body can receive without violating water quality standards. The LC is equivalent in meaning to the Total Maximum Daily Load, though it may be expressed in terms other than pounds per day.

WASTELOAD ALLOCATION (WLA) is the portion of a receiving water's loading capacity that is allocated to existing and future point sources. The WLA should incorporate the potential for growth in the point sources, such as using a long-range design flow for municipal facilities and flows base on projected growth in commercial sources.

The primary method of allocating wasteloads among multiple point sources is typically determined by priority of permit application and demonstration of need. Subsequent applications for permit, or permit modifications, may be allocated pollutant load only within the established WLA for that pollutant. New dischargers, or increased loadings from existing dischargers to a waterbody may be allowed only to the extent that the existing TMDL can be reallocated among all dischargers, based on demonstration of need, in an equitable manner.

LOAD ALLOCATION (LA) is the portion of a receiving water's loading capacity that is allocated to existing and future nonpoint sources and to natural background sources.

MARGIN OF SAFETY (MOS) or safety factor, is the prescribed mechanism to account for the uncertainty in determining the amount of pollutant load and its effect on water quality. MOS may be incorporated implicitly – using conservative assumptions within calculations or models – or explicitly during allocation of loads, or both. MOS guidelines are shown below:

TABLE 12: MODELING EFFORT/TMDL SAFETY FACTOR

Model	System Complexity	Margin of Safety
Uncalibrated	Multiple Source/Complex Waste	25%
	Single Source/Uniform Waste	20%
Calibrated	Multiple Source/Complex Waste	15%
	Single Source/Uniform Waste	10%
Verified	–	5%

WATER-QUALITY MODELING

The primary tool used in establishing a link between sources and water quality standards in the TMDL process is the water quality model. Results provided in TMDL studies from these models are used to assist in making effective decisions on recommended levels of reduction of pollutant loading. A complete discussion of the process of water quality modeling is beyond the scope of this document. However, the remainder of this section attempts to present the technical framework and policies by which DEQ conducts its water quality modeling exercises.

MIXING ZONES

STREAMS AND RIVERS

Oklahoma's WQS define a regulatory mixing zone for discharges into different types of waterbodies. In streams, the mixing zone extends downstream a distance equivalent to thirteen times the width of the water within the receiving stream at the point of effluent discharge and encompasses 25% of the total stream flow of the $_7Q_2$ or 1 cfs, whichever is larger, immediately downstream of the point of effluent discharge. Where overlapping mixing zones occur because of multiple outfalls, the total length of the mixing zone will extend thirteen stream widths downstream from the downstream discharge point. It is important to note that the total stream flow includes both the upstream and the effluent flow.

Dependent on the use being protected a standard may apply in the mixing zone, at the edge of the mixing zone, or after complete mixing. In addition, beneficial uses may change in a waterbody segment. Since the zone of impact of a discharge may extend through multiple waterbody segments this change may result in multiple requirements and targets. In general, if more than one narrative or numerical criteria are assigned to a stream, the most stringent shall be maintained. These multiple requirements should be considered in setting a target for a TMDL.

LAKES

Oklahoma's WQS require that mixing zones for lakes be designated on a case-by-case basis. Dependent on the use being protected a standard may apply in the mixing zone, at the edge of the mixing zone, or after complete mixing. For purposes of implementation of numerical toxics criteria for protection of fish and wildlife, the lake mixing zone extends one hundred feet from the source, unless otherwise specified in the Oklahoma WQS.

The dynamics between lake hydrology, water quality, and attainment of beneficial uses is very complex. For other than numerical toxics criteria for protection of fish and wildlife, implementation of water pollution control strategies for lakes may sometimes be directed more towards a qualitative rather than quantitative objective (e.g., change in trophic state).

As with TMDLs for streams and rivers, multiple requirements may necessitate setting multiple goals. These multiple goals may lend themselves more readily to a phased approach for lakes than for streams and rivers.

LEVEL OF EFFORT

The level of modeling effort necessary to establish an adequate TMDL may vary with the system complexity, potential for environmental impact, sensitivity of the system to the pollutants of concern, available resources, and other factors. Four modeling methods, each having varying levels of effort, are presented below. The levels of analysis are listed in order of increasing complexity, data requirements, and cost of application. In general, the more complicated approaches provide more detailed and accurate analyses, assuming enough data is available for proper model calibration. As a rule, an Uncalibrated Model should be used initially in all modeling analyses. The results from this analysis may then be used to determine if further data collection or analysis is needed.

METHOD 1 – UNCALIBRATED MODEL

This includes any 1-, 2-, or 3-dimensional, steady state or dynamic model in which water quality data and/or kinetics are estimated from existing literature or other data, rather than from an intensive survey. At a minimum, the model should account for the more significant pollutant related transport mechanisms. Model inputs should be based on expected values at critical conditions. Initially, this method should be used for all modeling analyses. Development of a TMDL or wasteload allocation should then be made with regard to the degree of confidence placed in the modeling. An uncertainty analysis should be performed to assure that variations in critical parameters do not substantially alter the WLA.

CONSERVATIVE SUBSTANCE MIXING ZONE MODEL

The Conservative Substance Mixing Zone Model (Hutcheson, 1992) will be used for calculating effluent wasteload allocation concentrations based on meeting Oklahoma's WQS at the edge of the mixing zone. The following equations are used to calculate the WLA:

$$WLA = C_b + \frac{(1+Q^*)(C_t - C_{b)}}{1.94Q^*} \quad (115)$$

When Q* is less than or equal to 0.1823, or

$$WLA = C_b + (6.17 - 15.51Q^*)(C_t - C_b) \quad (116)$$

When Q* is greater than 0.1823 and less than 0.3333, or

$$WLA = C_t \quad (117)$$

When Q* is greater than or equal to 0.3333.

Such that

WLA $\geq$ C_t for wasteload allocation purposes

Where:

C = Water quality standards criterion

Cb = Background concentration

Q* = QE/QU

QE = Effluent flow (MGD)

QU = Upstream flow (MGD)

COMPLETE MIX MASS BALANCE MODEL

A complete mix mass balance model will be used in calculating effluent wasteload allocation concentrations based on meeting Oklahoma's WQS after complete mix in the receiving water. For a single source discharger this can be expressed as:

$$WLA = C + \frac{(C - C_b)}{Q^*} \qquad (118)$$

Where:

C = Water quality standards criterion

Cb = Background concentration

Q* = QE/QU

QE = Effluent flow (MGD)

QU = Upstream flow (MGD)

HORIZONTAL JET MODEL

The horizontal jet model for a simple jet, as described in Section 9.2.1 of *Mixing in Inland and Coastal Waters*, Fischer et al, 1979, can be used to calculate the concentration of a surface plume for lentic waterbodies in the absence of site-specific data. If an applicant can provide site-specific data, this data may be used in lieu of the Fischer model.

The model represents the jet as a constantly spreading fan. Time averaged concentrations can be shown to fit a Gaussian distribution dependent on the width and distance along the centerline of the jet.

The following equations are used to calculate the WLA:

pipe: $$WLA = C_b + \frac{20.15(C_t - C_b)}{D} \qquad (119)$$

When *D* is greater than or equal to 3 feet, or

canal: $$WLA = C_b + \frac{4.2(C_t - C_b)}{\sqrt{W}} \qquad (120)$$

When *W* is greater than or equal to 3 feet.

Where

Ct = water quality standards criterion

Cb = background concentration

D = pipe diameter in feet

W = canal width in feet

MULTI-DISCHARGER DESKTOP DISSOLVED OXYGEN MODEL

The Multi-discharger Desktop Model (MULTID) is a Fortran program for performing dissolved oxygen related wasteload allocations for single or multiple dischargers. MULTID should be utilized initially for all modeling analysis as a screening method and to identify model sensitivity to various parameters. Selection of a treatment level should then be made with regard to the degree of confidence placed in the modeling. If the results indicate limits more stringent than technology based, a calibrated/verified model may be required, or desired.

The model is a modified version of the classic Streeter-Phelps formulation. The approach incorporates both carbonaceous (CBOD) and nitrogenous (NBOD) oxygen demands in the analysis, as well as CBOD settling and sediment oxygen demand. Figure 11 shows the interaction between state variables.

The basis of the model is the principle of conservation of mass. The general transport equation in one dimension for a uniform cross sectional plug flow reactor can be written as:

$$\frac{\partial C}{\partial t} = E\frac{\partial^2 C}{\partial x^2} - U\frac{\partial C}{\partial x} \pm \sum S \qquad (121)$$

Where:

C = Concentration of dissolved oxygen (mg/L)

t = Time at a stationary point (days)

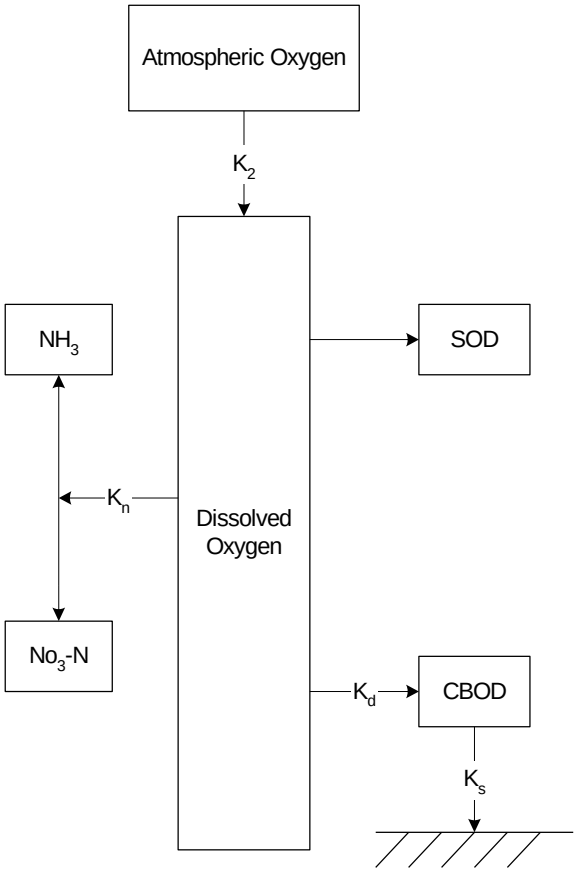
U = Velocity of flow in the x direction (meters/day)

E = Coefficient of dispersion in the x direction (m2/day)

x = Distance downstream (miles)

S = Sources and sinks of oxygen

FIGURE 11: MULTID OXYGEN BALANCE



When considering streams, the turbulent diffusion (longitudinal mixing) is generally insignificant and equation (121) becomes:

$$\frac{\partial C}{\partial t} = -U\frac{\partial C}{\partial x} \pm \sum S \qquad (122)$$

Under low flow conditions steady state is assumed and the above expression can be further simplified to

$$O = -U\frac{dC}{dx} \pm \sum S \qquad (123)$$

The more significant sources and sinks of reaeration, carbonaceous biochemical oxygen demand, nitrogenous biochemical oxygen demand, and sediment (benthic) demand, are included in the analysis. If first order rate models are hypothesized for CBOD removal, NBOD removal, and reaeration, these can be written as:

$$\frac{dL}{dt} = -K_r L \qquad (124)$$

Where:

K_r = $K_d + K_s$

K_r = overall rate of CBOD removal from water column

K_d = instream CBOD decay rate (1/day, base e)

K_s = CBOD settling rate (1/day, base e)

L = concentration of CBOD (mg/L)

Solution of this equation, using the boundary condition (B.C.) that L = L_o at t = 0, gives:

$$L = L_o e^{(-K_r)t} \qquad (125)$$

$$= L_o e^{-(K_d + K_s)t} \qquad (126)$$

$$= L_o e^{(-K_d)t} e^{(-K_s)t} \qquad (127)$$

For NBOD removal, a semi-empirical approach is used to formulate a 1st order model which represents the overall oxidation rate of the organic plus ammonia nitrogen (the TKN) to nitrate nitrogen:

$$\frac{dL^n}{dt} = -K_n L^n \qquad (128)$$

Where:

K_n = NBOD oxidation rate (1/day, base e)

L_n = concentration of NBOD (mg/L)

Solution of this equation using the B.C. that $L^n = L_o^n$ at t = 0 gives:

$$L^n = L_o^n e^{(-K_n)t} \qquad (129)$$

The formulation for reaeration can be written as:

$$\frac{dC}{dt} = K_2 (C_s - C) \qquad (130)$$

Where:

K_2 = reaeration rate coefficient (1/day, base e)

C_s = O_2 saturation concentration (mg/L)

If the oxygen deficit is defined as:

$$D = C_s - C \qquad (131)$$

Substitution into (130) gives:

$$\frac{dD}{dt} = -K_2 D - \frac{dC_s}{dt} \qquad (132)$$

If the assumption is made that the temperature, salinity, and pressure are constant in time, then C_s = constant and $\frac{dC_s}{dt}$ = 0. Thus,

$$\frac{dD}{dt} = K_2 D \qquad (133)$$

Solution of this equation using the B.C. that D = Do, the initial deficit (Cs - Co), at time t = 0, gives:

$$D = D_o e^{(-K_2)t} \qquad (134)$$

$$C = C_s - (C_s - C_o)e^{(-K_2)t} \qquad (135)$$

The final sink included in the analysis is sediment oxygen demand, which is usually formulated as a zero order model:

$$\frac{dC}{dt} = -\frac{SOD}{H} \qquad (136)$$

Where:

SOD = sediment oxygen demand (gm O_2/ft_2-day)

H = water depth, ft.

Substitution of these sources and sinks into equation (123) gives the general equation:

$$O = -U\frac{dC}{dx} + K_2(C_s - C) - K_r L - K_n L^n - \frac{SOD}{H} \qquad (137)$$

Or, using the more specific terms for the sources and sinks:

$$U\frac{dD}{dx} = -K_2 D + K_d L_o e^{(-K_r)t} + K_n L_o^n e^{(-k_n)t} + \frac{SOD}{H} \qquad (138)$$

Assuming a uniform cross section, at steady state

$$t = \frac{U}{x} \qquad (139)$$

Which results in:

$$\frac{dD}{dx} = \frac{K_2}{U}D + \frac{K_d L_o}{U}e^{-k_r(\frac{U}{X})} + \frac{K_n L_o^n}{U}e^{-K_n(\frac{U}{X})} + \frac{SOD}{H} \qquad (140)$$

This is a nonhomogeneous first-order linear ordinary differential equation. Assuming no change of the saturation value with distance, and using the B.C. that D = D_o at x = 0, the solution is given by:

$$D = D_O e^{(-K_2)t} + \frac{K_d L_o}{K_2 - K_r}\left(e^{(-K_r)t} - e^{(-K_2)t}\right) + \frac{K_n L^n}{K_2 - K_n}\left(e^{(-K_n)t} - e^{(-K_2)t}\right) + \frac{SOD}{HK_2}\left(1 - e^{(-K_2)t}\right) \qquad (141)$$

Or, in terms of DO concentration:

$$C = C_s - (C_s - C_o)e^{(-K_2)t} - \frac{K_d L_o}{K_2 - K_r}\left(e^{(-K_r)t} - e^{(-K_2)t}\right) - \frac{K_n L^n}{K_2 - K_n}(e^{(-K_n)t} - e^{(-K_2)t}) - \frac{SOD}{HK_2}\left(1 - e^{(-K_2)t}\right) \qquad (142)$$

This final equation for DO () is utilized in the modeling approach. The DO concentration is calculated at time t (with t = U/x) for the user specified number of points in a reach. The DO at the sag point is then compared to the required DO target for the reach. Changes in effluent levels are made until DO standards are met. Instream levels of CBOD and NBOD are also calculated at the specified number of points using the integrated forms of the first order decay models.

The resolution of the model can be adjusted by increasing or decreasing the number of stream reaches, as well as the number of calculation points in a reach. The level of resolution should be selected so that sufficient detail can be maintained to adequately reproduce the primary variable interactions and their effect on the DO concentration at the sag point.

OTHER MODELS

Other models, as appropriate for a particular evaluation, may be used in a method 1 analysis with prior approval of the permitting agency.

METHOD 2 – CALIBRATED MODEL

This includes any model in which the hydraulic parameters, water quality conditions, and biochemical kinetic rates are determined from data collected during an intensive survey conducted as near as possible to critical conditions. The model should be calibrated to those parameters, which most affect the receiving water. As with Method 1 an uncertainty analysis should be performed to determine the degree of confidence placed in the model and resulting allocation.

METHOD 3 – CONFIRMED

This level of analysis requires all the elements specified for Method 2 along with a second intensive stream survey. The model should again be calibrated using the second set of data with the same parameters used in the original calibration. Coefficients determined during both calibrations should then be compared. If there is no significant difference between the two sets of coefficients the models are confirmed. The final step in the wasteload evaluation involves using both calibration data sets to again estimate all coefficients so that all of the data is used in the final model. It would be expected that the level of uncertainty associated with the final model would be less than that associated with each individual calibrated model.

METHOD 4 – POST AUDIT MODEL

If the level of uncertainty associated with a calibrated or confirmed model is unacceptably high a subsequent intensive survey may be required after implementation of a wasteload allocation or other control mechanism. The post audit model is used to further confirm the model as well as the effectiveness of the control mechanism developed from the previous wasteload evaluation.

UNCERTAINTY ANALYSIS

A final step in the WLE process involves assessment of the uncertainty level associated with a particular TMDL or WLA. Several methods are available for the quantification of uncertainty in water quality modeling. Some of the more often used are sensitivity analysis, first order error analysis, and Monte Carlo Simulation. The method used should be consistent with the type of model and available data. At a minimum, a sensitivity analysis should be performed for any of the four levels of analysis used in Oklahoma. For a calibrated model the magnitude of the perturbation should reflect the actual uncertainty of that parameter. Results of an uncertainty analysis should be reviewed within the context of the effluent quality expected for various treatment levels. If a required treatment level is heavily sensitive to, and dependent on, the selection of an input value, further study may be appropriate to adequately characterize that model variable.

INTEGRATED WATER QUALITY REPORT LISTING METHODOLOGY

The following methodologies, along with the procedures described in Figure 13 near the end of this section, shall be used to determine the attainment status of a waterbody's designated beneficial uses and its subsequent categorization in the State's Integrated Water Quality Report, which is a combination of the State's Water Quality Assessment Report [305(b) report] and the Impaired Waters List [303(d) list]. When differing recommendations on a stream's Category status or assessment adequacy are made by different State agencies or other entities consulted, all data used shall be compiled together and re-assessed with consideration of site specific, watershed specific or other pertinent/appropriate information each agency shall have according to OAC 785:45-5-13(f)[*] , OAC 785:45-5-13(f)[†] and OAC 785:46-9-2[‡].

A waterbody that is listed on the State's current 303(d) list may only be placed in category 1,2, or 3 of the Integrated Report for "good cause" or if it is demonstrated that new data or information indicate that the waterbody is attaining its designated beneficial uses. "Good cause" shall mean that the State will provide a reasonable basis for the recommendation such as flaws in the original analysis that led to the water being listed; more recent or accurate data; more sophisticated water quality modeling; changes in conditions (e.g., new control equipment or elimination of discharges); or data is insufficient or non-existent to assess that all uses are met and the water should more appropriately be in Category 2 or 3.

Waterbodies in Categories 2 & 3 will be prioritized in a manner similar to the Category 5 waterbodies. A monitoring schedule will be included for Categories 2 & 3 as part of the Integrated Report. Waterbodies included on the most recent 303(d) list will receive the highest priority for future monitoring.

USAP

These procedures closely follow those set forth in the State's Use Support Assessment Protocol (USAP), which can be found in OAC 785:46-15. Where the USAP is silent, this listing methodology should be used. Where there are discrepancies between this methodology and the USAP, the USAP controls.

BENEFICIAL USES

The Listing Methodology is categorized into beneficial uses. Each beneficial use has a procedure for determining attainment of that use based on various kinds of biological, chemical, and historical data. The result of applying this methodology for any given beneficial use must be one of three choices: "attained", "not attained," and "not enough data to make a determination."

Some beneficial uses have procedures for several different types of data, all of which must be determinable – unless otherwise specified – in order to determine that the beneficial use is attained. Otherwise, the attainment decision must be designated "not enough data to make a determination."

DATA REQUIREMENTS

The data used to make a determination must meet various quantity, quality, spatial, and temporal requirements in order to satisfy the attainment procedures. The following general requirements apply unless otherwise specified in the use-specific procedures that follow. If neither an "attained" nor "not attained" determination can be made, then the overall determination for that beneficial use or subcategory shall be "not enough data to make a determination."

---

[*] OAC 785:45-5-13(e) states that the segment averages in Appendix F "shall be used unless more appropriate data are available".

[†] OAC 785:45-5-13(f) states that "In cases where mineral content varies within a segment, the most pertinent data available should be used".

[‡] OAC 785:46-9-2 states that " Data from surrounding segments shall be used …..to develop yearly mean standards and sample standards for those segments with inadequate historical data".

SPATIAL

- In general, stream sampling locations should take into consideration existing data, spatial distribution of monitoring sites, sources of pollution, and major hydrological features such as tributaries and dams.
- Non-wadable stream samples may represent a maximum of 25 stream miles, unless demonstrated to the contrary.
- Wadable stream samples may represent a maximum of 10 stream miles, unless demonstrated to the contrary.
- Lake samples may represent a maximum of 250 acres per sample, unless demonstrated to the contrary. Arms or portions of lakes may be treated separately from the main body of a lake.
- Samples may not be taken within regulatory mixing zones.

TEMPORAL

- Sampling must represent seasonal variation. Temporal bias should be avoided.
- Stream data older than five (5) years should not be used to make use attainment determinations unless insufficient data exists for the previous five (5) year period.
- Lake data older than ten (10) years should not be used to make use attainment determinations unless insufficient data exists for the previous ten (10) year period.
- Only data collected up to April 30 of the year preceeding the reporting year should be used in use attainment determinations.

QUANTITY

- For streams, a minimum of ten (10) samples is required to determine use attainment for parameters such as DO, pH, temperature, coliform bacteria, dissolved solids, and salts.
- For lakes of more than 250 surface acres, a minimum of twenty (20) samples is required to determine use attainment for parameters such as DO, pH, temperature, coliform bacteria, chlorophyll-α, and dissolved solids. For lakes of 250 surface acres or less, a minimum of ten (10) samples is required.
- For toxicants, a minimum of five (5) samples is required to determine use attainment.
- For any type of sample, if existing samples already assure a "not attained" determination, the minimum sample quantity requirement does not apply.

PQLS

CRITERIA ABOVE PQL

If sample values are below the PQL for a parameter whose criterion is above the PQL, appropriate nonparametric statistical measures shall be used to determine the reporting value.

For waterbodies identified as impaired on the current Integrated Report, if sample values are nondetectable for a parameter whose criterion is above the PQL, then such value shall be deemed to be one-half (1/2) of the parameter PQL.

All sample values that are above the PQL shall be the reported values.

CRITERIA BELOW PQL

If sample values are below the PQL for a criterion which is less than one-half (1/2) of the PQL, then the values shall be deemed to be zero (0) until the first test result above the PQL appears. After that time, sample values which are below the PQL shall be deemed to be equal to the criterion value until four (4) subsequent contiguous samples are shown to be below the PQL. Any subsequent sample values which are nondetectable may be treated as zero (0) until the next test result appears above the PQL.

For those parameters whose criteria are at least two (2) orders of magnitude below the PQL, evidence considered with respect to assessment of use support shall include fish tissue analysis, biological community analysis, biological thresholds wherever available, or other holistic indicators which are appropriate for the beneficial use in question.

If sample values are below the PQL for a criterion which is greater than or equal to one-half (1/2) of the PQL but less than the PQL, then the values shall be deemed to be one-half (1/2) of the criterion value until the first test result above the PQL appears. After that time, sample values which are below the PQL shall be deemed to be equal to the criterion value until four (4) subsequent contiguous samples are shown to be below the PQL. Any subsequent sample values which are nondetectable may be treated as equal to one-half (1/2) of the criterion value until the next test result appears above the PQL.

For waterbodies identified as impaired in the current Integrated Report, if sample values are nondetectable for a parameter whose criterion is below the PQL, then such value shall be deemed to be one-half (1/2) of the criterion value.

All sample values that are above the PQL shall be the reported values.

MAGNITUDE OF EXCEEDANCE

- For toxicants, if two or more samples exceed water quality criteria or screening levels by two orders of magnitude or more, the associated beneficial use is determined to be "not attained."
- For DO, if more than two samples in a stream are below 2 mg/L in a given year, the Fish & Wildlife Propagation beneficial use is determined to be "not attained."

QUALITY ASSURANCE

Data collected for purposes of use support assessment shall be collected using documented programmatic quality assurance and quality control methods substantially in accordance with those required by "EPA Requirements for Quality Assurance Project Plans", EPA publication no. EPA/240/B-01/003 (March 2001).

The methods used shall include protections for sample integrity and the documentation of details on analysis methodologies.

DEFAULT PROTOCOL

This method for determining beneficial use attainment should be used where another, more specific method is not provided.

SHORT TERM AVERAGE PARAMETERS

Short term average parameters are based on exposure periods of less than seven days, such as sample standards (agriculture beneficial use) and turbidity.

A beneficial use is considered *attained based on the default protocol for a given short term average parameter* if:

10% or fewer of the samples exceed the appropriate screening level or water quality criterion

or

The determination using the default protocol yields "fully supporting but threatened" and the threat will not yield a determination of other than fully supporting within two years of the determination.

A beneficial use is considered *not attained based on the default protocol for a given short term average parameter* if:

Greater than 10% of the samples exceed the appropriate screening level or water quality criterion

or

The determination using the default protocol yields "fully supporting but threatened" and the threat will yield a determination of other than fully supporting within two years of the determination.

LONG TERM AVERAGE PARAMETERS

Long term average parameters are based on exposure periods of seven days or longer, such as yearly mean standards (agriculture beneficial use) and fish consumption water column numerical criteria.

A beneficial use is considered *attained based on the default protocol for a given long term average parameter* if:

Each 2-year rolling average of the sample results does not exceed the long term average criterion or screening level

or

The determination using the default protocol yields "fully supporting but threatened" and the threat will not yield a determination of other than fully supporting within two years of the determination.

A beneficial use is considered *not attained based on the default protocol for a given long term average parameter* if:

Any 2-year rolling average of the sample results exceeds the long term average criterion or screening level

or

The determination using the default protocol yields "fully supporting but threatened" and the threat will yield a determination of other than fully supporting within two years of the determination.

FISH & WILDLIFE PROPAGATION (F&WP)

The methodology for the Fish & Wildlife Propagation (F&WP) beneficial use consists of eight types of data, each with its own attainment methodology.

The F&WP beneficial use is considered *attained* if:

In the absence of biological data, all six *chemical* methodologies (DO, Toxicants, pH, Turbidity, Oil & Grease, and Toxicants Not Assessed & Not Likely to Occur or Violate Criteria) result in a determination of *attained*

or

*In the absence of adequate data for **all six** chemical data types*, the biological data methodology results in a determination of *attained*.

The F&WP beneficial use is considered *not attained* if ***any*** of the eight data type methodologies result in a determination of *not attained*.

DISSOLVED OXYGEN (DO)

STREAMS

A minimum of ten (10) samples is required to make an attainment determination.

The F&WP beneficial use is considered *attained with respect to dissolved oxygen* if 10% or fewer of the samples from a waterbody have a DO concentration of less than:

- 4.0 mg/L from April 1 - June 15 (3.0 mg/L from June 16-March 31) for habitat limited aquatic communities (HLAC)
- 6.0 mg/L from April 1 - June 15 (5.0 mg/L from June 16 – March 31) for warm water aquatic communities (WWAC)
- 7.0 mg/L from March 1 - May 31 (6.0 mg/L for the remainder of the year) for trout fisheries and cool water aquatic communities (CWAC)

The F&WP beneficial use is considered to be *undetermined* if the sample results show:

- More than 10% of samples are less than 6.0 mg/L from April 1 – June 15 (5.0 from June 16 – October 15) *and* 10% or fewer of the samples are less than 5.0 mg/L from April 1 – June 15 (4.0 from June 16 – October 15) for warm water aquatic communities (WWAC)
- More than 10% of samples are less than 7.0 mg/L from March 1 – May 31 (5.0 from June 1 – October 15) *and* 10% or fewer of the samples are less than 5.0 mg/L from March 1 – May 31 (4.0 from June 1 – October 15) for trout fisheries and cool water aquatic communities (CWAC).

The F&WP beneficial use is considered *not attained with respect to dissolved oxygen* if more than 10% of the samples from a waterbody have DO concentrations less than the criteria listed below or if more than 2 samples in a given year are below 2 mg/L.

- 4.0 mg/L from April 1 – June 15 (3.0 from June 16 – March 31) for habitat limited aquatic communities (HLAC)
- 5.0 mg/L from October 16 – June 15 (4.0 mg/L from June 16 – October 15) for warm water aquatic communities (WWAC)
- 5.0 mg/L from June 1 – Oct 15 (6.0 mg/L during the remainder of the year) for trout fisheries and cool water aquatic communities (CWAC)

LAKES

For lakes or arms of 250 acres or less, a minimum of ten (10) samples is required to make an attainment determination. For lakes or arms of greater than 250 acres, a minimum of twenty (20) samples is required.

The Warm Water Aquatic Community subcategory of the Fish and Wildlife Propagation designated use for a lake shall be deemed to be attained with respect to dissolved oxygen if both the Surface Criteria and the Water Column Criteria listed below are satisfied. If either the Surface or Water Column criteria produce an undetermined result, the lake beneficial use will be considered *undetermined* with respect to dissolved oxygen. If either the Surface or Water Column criteria produce a result of not attained, the Fish and Wildlife Propagation designated use will be considered *not attained* with respect to dissolved oxygen.

SURFACE CRITERIA FOR WWAC LAKES

The F&WP beneficial use is considered *attained with respect to dissolved oxygen* if:

10% or less of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less than 6.0 mg/L from April 1 – June 15 (5.0 mg/L during the remainder of the year).

The F&WP beneficial use is considered *undetermined with respect to dissolved oxygen* if:

More than 10% of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less than 5.0 mg/L from June 16 through October 15 (6.0 mg/L from April 1 – June 15)

and

10% or less of the samples are less than 4 mg/L from June 16 through October 15 (5.0 mg/L from April 1 – June 15),

The F&WP beneficial use is considered *not attained with respect to dissolved oxygen* if:

More than 10% of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less that 4.0 mg/L from June 16 – October 15 (5.0 mg/L during the remainder of the year).

WATER COLUMN CRITERIA FOR WWAC LAKES

The F&WP beneficial use is considered *attained with respect to dissolved oxygen* if:

Less than 50% of the lake volume has a DO concentration below 2.0 mg/L

or

If no volumetric data is available, 50% or less of the water column of all sample sites in the lake have a DO concentration below 2.0 mg/L.

The F&WP beneficial use is considered *undetermined* with respect to dissolved oxygen if:

50% or more, but not greater than 70%, of the lake water column at any sample site has a DO concentration of less than 2.0 mg/L

The F&WP beneficial use is considered *not attained with respect to dissolved oxygen* if:

50% or more of the water volume has a DO concentration of less than 2.0 mg/L

or

If no volumetric data is available, more than 70% of the water column at any given sample site has a DO concentration of less than 2 mg/L.

TOXICANTS

A minimum of five (5) samples is required to make an attainment determination.

The following screening values shall be used to make attainment decisions for toxicants:

- The acute and/or chronic criteria for a given toxicant, as described in Appendix G, Table 2 of the Oklahoma Water Quality Standards, OAC 785:45
- The chronic ammonia toxicity value shown in Table 13 corresponding to the stream pH and temperature at the time of sampling

For metals, preference shall be given to attainment decisions based on dissolved metals in accordance with the procedures specified in OAC 785:46-15-5(h).

ACUTE EFFECTS

The F&WP beneficial use is considered *attained with respect to an individual toxicant* if no more than one (1) of the samples have concentrations of a toxicant that exceed the acute criterion or screening value for that toxicant.

The F&WP beneficial use is considered not attained with respect to an individual toxicant if more than one (1) of the samples have concentrations of a toxicant that exceed the acute criterion or screening value for that toxicant.

CHRONIC EFFECTS

The F&WP beneficial use is considered *attained with respect to an individual toxicant* if:

Not more than one (1) of the samples have concentrations of a toxicant that exceed the chronic criterion or screening value for that toxicant

or

Not more than 10% of the samples have concentrations of a toxicant that exceed the chronic criterion or screening value for that toxicant

The F&WP beneficial use is considered ***not attained with respect to an individual toxicant*** if more than 10% of the samples have concentrations of a toxicant that exceed the chronic criterion or screening value.

TABLE 13: TEMPERATURE- AND PH-DEPENDENT SCREENING VALUES FOR AMMONIA

	Temperature (°C)									
pH	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

PH

A minimum of ten (10) samples is required to make an attainment determination.

The F&WP beneficial use is considered *attained with respect to pH* if 10% or fewer of the samples fall outside the screening range of 6.5 (minimum) and 9.0 (maximum).

The F&WP beneficial use is considered *not attained with respect to pH* if more than 10% of the samples fall outside the screening range of 6.5 (minimum) and 9.0 (maximum).

BIOLOGICAL DATA

Following are two stand-alone methods for determining impairment based on biological samples—one for benthic macroinvertebrates (BMI) and another for fish. Each acts independent of the other because of the availability of separate cause codes for bioassessments. A cause code does exist for a combined bioassessment, but that particular scenario is not addressed in this methodology. Oklahoma has implemented narrative biocriteria for fish in its Use Support

Assessment Protocols (OAC 785:46-15-5(i)), and these biocriteria are included as part of the assessment tool outlined below. However, the same section (OAC 785:46-15-5(i)(1)) states "If data demonstrate that an assemblage of fish or macro invertebrates from a waterbody is significantly degraded, according to 785:45-5-12(f)(5), from that expected for the subcategory of Fish and Wildlife Propagation designated in OAC 785:45 for that waterbody, then that subcategory may be deemed by the appropriate State environmental agency to be not supported." Because of this, it is imperative that a method be developed to assess the large of amount of BMI data collected to date and in the future. Also, it is important to utilize fish data across the State, when the fish biocriteria is either inconclusive (i.e., "undetermined") or unavailable in a particular ecoregion or for a particular aquatic life designation within a promulgated ecoregion. For this reason an alternative fish assessment method has been developed and included in the following methodology. However, the Oklahoma biocriteria trumps the alternative method whenever it returns an assessment of attaining or not attaining.

Biological criteria have been established for various ecoregions in Oklahoma under OAC 785:46-15-5 (see Figure 12). These biocriteria must be referenced when making Fish and Wildlife beneficial use attainment determinations for fish in accordance with method below. OAC 785:46 Appendix C Index of Biological Integrity should be used for these ecoregions. This methodology is only applicable to wadable streams.

For waterbodies where no biological data is available, a resulting determination of *"attained"* with respect to all six chemical data type methodologies (DO, pH, Toxicants, Turbidity, Oil & Grease, and Toxicants Not Assessed & Not Likely to Occur or Violate Criteria) may serve to determine attainment of the F&WP beneficial use.

For waterbodies where *only* biological data is available, a determination of *"attained"* with respect to biological assessment(s) (in accordance with method below) may serve to determine attainment of the F&WP beneficial use. Determinations of attainment of F&WP for both/either fish and/or benthic macroinvertebrates may be made in accordance with the following methods:

ASSESSMENT OF F&WP BENEFICIAL USE WITH FISH COLLECTION DATA

- Data requirements: Fish collections must be made in accordance with methods outlined in OWRB Technical Report 99-3, Oklahoma Conservation Commission Standard Operating Procedures (SOPs), Oklahoma Water Resources Board SOPs or equivalent and collected under an EPA approved Quality Assurance Project Plan. Collections should be made during a defined seasonal index period (index) in flowing water. A maximum of 5 collections are allowed for assessment determination for the reporting period (1 index period per year, 5 year reporting period).

  Definitions:

  - **Collection** – all fish obtained from a single site on a given date.
  - **Index** – one seasonal period prescribing defined temporal limits for collection. (Late Spring – Early Fall index – May 15-October 31).

- Collections must be completely enumerated and identified to species. Taxonomic identifications should be performed using keys contained in The Fishes of Oklahoma, The Fishes of Arkansas, or The Fishes of Missouri. Adequate voucher samples should be maintained through specimen collections and/or photo-documentation per SOPs in Section 1.

- Collections must be analyzed using an Index of Biotic Integrity (IBI) approach (EPA, 1989, 1999) comprised of the seven following metrics: number of species, number of sensitive benthic species, number of sunfish species, number of intolerant species, proportion tolerant individuals, proportion insectivorous cyprinid individuals, proportion individuals as lithophilic spawners. The metrics must be derived and scored for each sample in accordance with methods outlined in EPA's Rapid Bioassessment Protocol (EPA 1989 and 1999) (see Table 14). Consult ecoregion reference metric scores (available from OWRB or OCC Water Quality Division offices) as necessary to facilitate scoring process. This method will be known as "OKIBI".

TABLE 14. MATRIX TO DETERMINE METRIC SCORES FOR EACH SAMPLE OF FISH

Metrics	5	3	1
Number of species*	>67%	33-67%	<33%
Number of sensitive benthic species*	>67%	33-67%	<33%
Number of sunfish species*	>67%	33-67%	<33%
Number of intolerant species*	>67%	33-67%	<33%
Proportion tolerant individuals**	<10%	10-25%	>25%
Proportion insectivorous cyprinid individuals**	>45%	20-45%	<20%
Proportion individuals as lithophilic spawners**	>36%	18-36%	<18%

* Sample metric divided by the reference metric for the applicable ecoregion
** Score based on actual value

1. Metric scores for each collection must then be summed to compute a "total OKIBI score." Scores for multiple collections made during the same index for a given year must be averaged to render a single per year score. Total OKIBI scores will then be compared to reference OKIBI scores (available from OWRB or OCC Water Quality Division offices) for the appropriate ecoregion in order to determine final fish support status (Table 15) (adapted from EPA RBP, 1989):

TABLE 15. BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON FISH COLLECTIONS.

% of Reference OKIBI score	Biological Condition Category	Sample Support Status
>80%	Not impaired	Attaining
50-80%	Possible impairment to no impairment	Undetermined
<50	Impaired	Not Attaining

2. Overall fish support status for the OKIBI is determined considering support status of all collections obtained within the reporting period as follows:

   a. If only one sample was collected - support status stands as called

   b. If two or more samples were collected:

      - Determine support status based on majority
      - In instances when no majority exists, the final result is undetermined

3. Use Table 16 to determine the final Fish and Wildlife Propagation (FWP) beneficial use assessment for fish. In the following table, fish biocriteria that have been promulgated in Oklahoma's USAP are referred to as OKBIOCRIT, while the method outlined in this document is referred to as OKIBI. *You must determine an OKBIOCRIT result for all collections where applicable. The OKIBI can only be used when the OKBIOCRIT returns an undetermined result or is not promulgated in rule for a particular ecoregion or aquatic life tier.*

TABLE 16. FINAL FWP USE ASSESSMENT BASED UPON FISH COLLECTIONS

OKBIOCRIT Result	OKIBI Result	Final Fish Assessment
Not Available	Attaining	Attaining
Not Available	Not Attaining	Not Attaining
Not Available	Undetermined	Undetermined
Undetermined	Attaining	Attaining
Undetermined	Not Attaining	Not Attaining

OKBIOCRIT Result	OKIBI Result	Final Fish Assessment
Undetermined	Undetermined	Undetermined
Attaining	Undetermined	Attaining
Not Attaining	Undetermined	Not Attaining

Assessment of F&WP Beneficial Use with Benthic Macroinvertebrate Data

1. Data requirements: Macroinvertebrate collections must be made in accordance with methods outlined in OWRB Technical Report 99-3, Oklahoma Conservation Commission (OCC) Standard Operating Procedures (SOPs), Oklahoma Water Resources Board (OWRB) SOPs or equivalent and collected under an EPA approved Quality Assurance Project Plan. Collections should be made during defined seasonal index periods (index) in flowing water and target best available habitats in the following order of importance: rocky riffles, streamside root masses, and woody debris. A minimum of four macroinvertebrate samples (collected over at least a two year period) is required for assessment. A maximum of 10 collections are allowed for the reporting period (2 index periods per year, 5 year reporting period).

   Definitions:

   - **Sample** – macroinvertebrates resulting from a single habitat type (riffle, vegetation, wood) from a single site on a given date.
   - **Collection** – all samples obtained from a single site on a given date. A single collection may include up to three samples, one from each habitat type.
   - **Index** – one of two seasonal periods prescribing defined temporal limits for collection. (Summer index – June 1-September 15; Winter Index – January 1-March 15th).

2. Samples must be picked in accordance with EPA approved SOPs to achieve either a 100 or 300 organism sub-sample to be sent to professionals for identification to genus (when possible). Taxonomic identifications should be performed using keys by Merritt and Cummins, Pennak, or other regional guides with justification.

3. Samples must be analyzed using an Index of Biotic Integrity (IBI) approach (EPA, 1989, 1999) comprised of the six following metrics: total number of taxa, number of EPT taxa, proportion EPT taxa, proportion dominant two taxa, modified Hilsenhoff Biotic Index (HBI), and Shannon Diversity. The metrics must be derived and scored for each sample (e.g., summer-riffle, winter-wood) in accordance with methods outlined in EPA's Rapid Bioassessment Protocol (EPA 1989 an 1999) (see Table 17). Consult ecoregion reference metric scores (available from OWRB or OCC Water Quality Division offices) as necessary to facilitate scoring process.

TABLE 17. MATRIX TO DETERMINE METRIC SCORES FOR EACH SAMPLE OF MACROINVERTEBRATES.

Metrics	*6*	*4*	*2*	*0*
Taxa Richness*	>80%	60-80%	40-60%	<40%
Modified HBI**	>85%	70-85%	50-70%	<50%
EPT/Total***	>30%	20-30%	10-20%	<10%
EPT Taxa*	>90%	80-90%	70-80%	<70%
% Dominant 2 Taxa***	<20%	20-30%	30-40%	>40%
Shannon-Weaver***	>3.5	2.5-3.5	1.5-2.5	<1.5

* sample metric divided by the reference metric for the applicable ecoregion

** reference metric value for the applicable ecoregion divided by the sample metric value

***score based on actual value

4. Metric scores for each sample must then be summed to compute a "total IBI score." Scores for multiple collections made during the same index for a given year must be averaged to render a single index-habitat score per year (e.g., only one score for summer-riffle or winter-wood per year). Total IBI scores will then be compared to reference IBI scores (available from OWRB or OCC Water Quality Division offices) for the appropriate index-habitat and ecoregion to determine final macroinvertebrate support status (Table 18) (adapted from the EPA RBP, 1989). If the macroinvertebrate sample was made as part of a probabilistic monitoring project use Table 19 to determine sample support status.

TABLE 18. BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON MACROINVERTEBRATE SAMPLES.

% of Reference IBI score	Biological Condition Category	Sample Attainment Status
>80%	Non-impaired	Attaining
50-80%	Possible impairment to no impairment	Undetermined
<50	Impaired	Not attaining

TABLE 19. BIOLOGICAL CONDITION AND ASSOCIATED SUPPORT STATUS BASED UPON PROBABILISTIC MACROINVERTEBRATE SAMPLES.

% of Reference IBI score	Biological Condition Category	Sample Attainment Status
>85%	Non-impaired	Attaining
40-85%	Possible impairment to no impairment	Undetermined
<40	Impaired	Not attaining

5. With support status of samples determined, render macroinvertebrate support status for each **collection** as follows:

   a. If a riffle sample was collected, use the support status of the riffle sample to represent the collection.

   b. If riffle sample status is "undetermined," then the support status of the collection will be determined by the better of vegetation or wood scores.

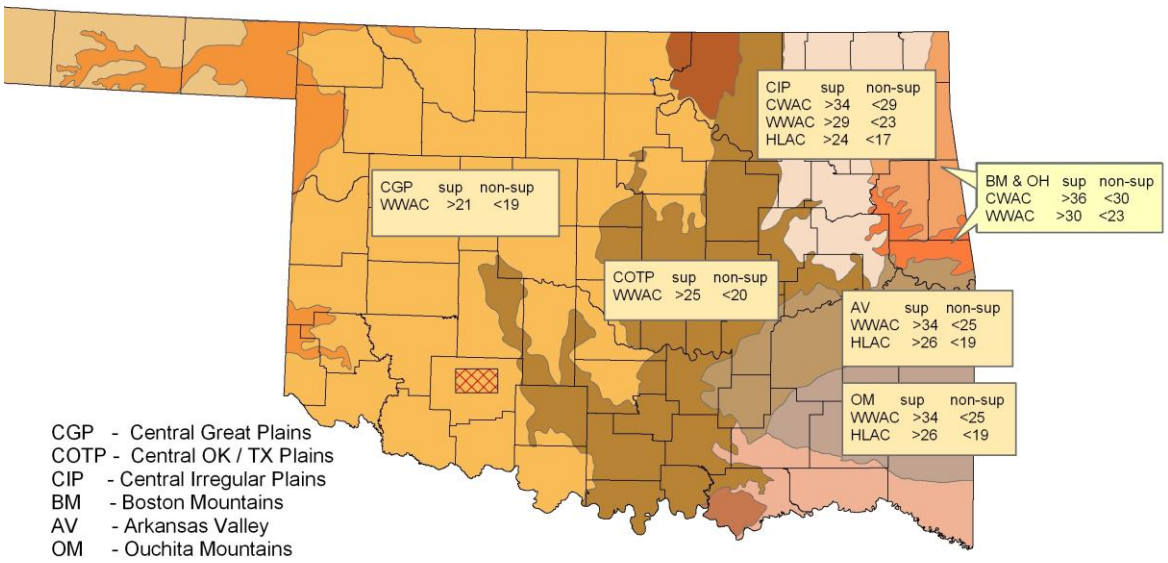
   c. If all samples are "undetermined," then the macroinvertebrate support status for the collection is "undetermined."

6. A minimum of four macroinvertebrate samples (collected over at least a two year period) is required for assessment. Overall Fish and Wildlife Propagation (FWP) beneficial use attainment for macroinvertebrates is determined considering support status of all collections obtained within the reporting period in accordance with Table 20.

TABLE 20. FINAL FWP USE ATTAINMENT DETERMINATION BASED UPON MACROINVERTEBRATES.

Minimum number of "Attaining" collections	Number of "Undetermined" collections	Number of "Not Attaining" collections	Final Macroinvertebrate Assessment
2	any	0	Attaining
any	any	1	Undetermined
any	any	2 or more	not attaining

FIGURE 12: ECOREGIONS WHERE BIOCRITERIA HAVE BEEN ESTABLISHED



NOTE: criteria do not apply to crosshatched area

Ref: OAC 785:46-15-5(h) through (m)

TURBIDITY

A minimum of ten (10) samples collected under seasonal base flow conditions is required to make an attainment determination.

The following numerical criteria shall be used to make attainment decisions for turbidity:

- 10 Nephelometric Turbidity Units (NTUs) for cool water aquatic communities and trout fisheries
- 25 NTUs for lakes
- 50 NTUs for other surface waters

The F&WP beneficial use is considered *attained with respect to turbidity* if:

10% or fewer of the samples exceed the appropriate screening level or water quality criterion.

or

The numerical criteria yield a determination of "fully supporting but threatened" and the threat will not yield a determination of other than fully supporting within two years of the determination.

The F&WP beneficial use is considered *not attained with respect to turbidity* if:

Greater than 10% of the samples exceed the appropriate screening level or water quality criterion

Or

The numerical criteria yield a determination of "fully supporting but threatened" and the threat will yield a determination of other than fully supporting within two years of the determination.

The determination of seasonal base flow conditions should be made in accordance with the following methods:

- For recording gaged sites (including ones with gages at the site or near to the site with no intervening inflows):

    1. Calculate the mean and median discharge of the 30 days surrounding the sampling event.

    2. If Q at sampling event not greater than median—**considered baseflow conditions, use in assessment;** OR

       If Q at sampling event greater than median—look at mean

    3. If Q at sampling event not greater than mean, go to step 4; OR

       If Q at sampling event greater than mean - **considered above baseflow conditions, exclude from assessment.**

    4. If Q is greater than the median but not the mean, use the weight of evidence method described below.

- For non-recording gaged or ungaged sites use a weight of evidence of coincident parameters (e.g., instantaneous discharge, turbidity, conductivity, total phosphorus, and total suspended solids), relevant weather station information (as available and applicable), and observational data (e.g., presence of a defined periphyton line, site comments, quantitative flow rating such as "elevated" or "heavy"). Perform the following steps:

    1. Compile concurrent turbidity, turbidity cause qualifier (i.e., abiotic, biotic), Inst. Q, TP, TSS, conductivity, and site observation data (which includes qualitative stream stage and site comments). Sort by site and date.

    2. For each site, move through the data looking for inflections in Inst. Q supported by similar inflections in concurrent parameters (e.g., increase in TP, TSS; decrease in conductivity). Quite a few of the elevated flows are indicated by the qualitative stream stage and site comments (e.g., "recent rainfall"), so the determination is immediate. Mark these events as exceeding baseflow.

    3. Where applicable and practical, compare analysis to nearby mesonet data. This cannot be used to preclude the above analysis but can be used as a confirmation step to add to the weight of evidence approach.

    4. Remove the "elevated flows" and perform the analysis.

- For sites where all turbidity values are below the applicable criterion, determination of events exceeding baseflow conditions is not necessary.

OIL & GREASE

A minimum of ten (10) visual observations made over a period of at least ten (10) months is required to make an attainment determination.

Any of the following visual characteristics shall indicate the presence of oil or grease:

- a rainbow sheen that flows when stirred, rather than crackling
- a golden tan to dark brown coating or globules on the water or in stream sediment

The F&WP beneficial use is considered *attained with respect to oil & grease* if 10% or fewer observations reveal the presence of oil or grease.

The F&WP beneficial use is considered *not attained with respect to oil & grease* if more than 10% of the observations reveal the presence of oil or grease.

SEDIMENT

The F&WP beneficial use is considered *attained with respect to sediment* if the use is also attained with respect to biological criteria.

If the biological data assessment results in a determination of "not attained," a habitat assessment must be conducted using the habitat assessment protocols found in OWRB Technical Report TRWQ2001-1, "Unified Protocols for Beneficial Use Assignment for Oklahoma Wadable Streams."

The results of the habitat assessment shall then be compared to either historical conditions or regional reference conditions in order to determine attainment with respect to sediment. The method for establishing reference conditions shall meet the following requirements:

- A minimum of five (5) reference streams or reaches shall be assessed
- The reference streams or reaches must be within the same ecoregion as the test stream
- The reference streams or reaches must be streams with similar flow regimes no more than two (2) stream orders(as defined in 46:1-2) removed from the test stream

The reference streams or reaches must be representative of the historic or average condition of the *least impacted streams* within the ecoregion whose watersheds contain soils, vegetation, land uses, and topography typical of the watershed of the test stream(s).The F&WP beneficial use is considered *not attained with respect to sediment* if any of the *following habitat par*ameters deviate from the reference conditions by the specified amount:

- Pool Bottom Substrate – the total percent of clay, silt, and loose sand in the test stream is increased by more than 30% over the reference condition
- Cobble Embeddedness – cobble embeddedness is increased by 15% or more over the reference condition
- Point Bars and/or Islands – reach length percentage containing fresh (non-vegetated) point bars and/or islands is 20 or more percentage points above that of the reference condition
- Deep Pools – percentage of reach dominated by deep pools (0.5 meters or more) is less than 70% of that of the reference condition

If all of the habitat parameters identified above deviate from the reference conditions by less than the amounts specified, then the fish and wildlife propagation beneficial use is not impaired due to suspended and bedded sediments.

TOXICANTS NOT ASSESSED AND NOT LIKELY TO OCCUR OR VIOLATE CRITERIA

The data required to assess every water quality criterion – specifically toxicants – associated with the F&WP use do not always exist for a particular waterbody. The following procedure may be used to determine attainment of the F&WP beneficial use with respect to toxicants that have not been assessed, but are not likely to occur or violate criteria.

The following three types of information must be available in order to apply this procedure:

1. The results of a review of watershed-specific landuse and historical data that yields patterns of use or nonuse of the toxicant(s) not assessed.
2. A result of either “attained” or “not enough information” for the Toxicants methodology.
3. A result of either “attained” or “not enough information” for the Biological Data methodology.

NOTE: The decision matrix below may be used to determine *attainment of the F&WP beneficial use with respect to the unassessed toxicants **only if*** the landuse and historical data review yields no indication that the unassessed toxicants are present or likely to impact the waterbody in question.

TABLE 21: DECISION MATRIX FOR TOXICANTS NOT ASSESSED OR LIKELY TO OCCUR OR VIOLATE F&WP CRITERIA

		Biological Data	
		Attained	Not Enough Information
Toxicants	Attained	F&WP ***Attained*** With Respect To Unassessed Toxicants	F&WP ***Attained*** With Respect To Unassessed Toxicants
	Not Enough Information	F&WP ***Attained*** With Respect To Unassessed Toxicants	***Not Enough Information*** to Determine F&WP Attainment With Respect to Unassessed Toxicants

PRIMARY BODY CONTACT RECREATION (PBCR)

A minimum of ten (10) samples is required to make an attainment determination. Samples must be taken during the recreation period of May 1 – September 30.

Geometric means will be calculated using all data meeting the temporal data requirements. The geometric means will be compared to the appropriate screening value.

ESCHERICHIA COLI (E. COLI)

The PBCR beneficial use is considered *attained with respect to E. Coli* if:

The geometric mean of the samples does not exceed 126 colonies/100 ml

The PBCR beneficial use is considered *not attained with respect to E. Coli* if:

The geometric mean of the samples exceeds 126 colonies/100 ml

ENTEROCOCCI

The PBCR beneficial use is considered *attained with respect to Enterococci* if:

The geometric mean of the samples does not exceed 33 colonies/100 ml

The PBCR beneficial use is considered *not attained with respect to Enterococci* if:

The geometric mean of the samples exceeds 33 colonies/100 mL

SECONDARY BODY CONTACT

Attainment for the SBCR beneficial use is identical to the PBCR attainment methodology, but using five times (5x) the PBCR numerical criteria.

PUBLIC AND PRIVATE WATER SUPPLY (PPWS)

In order to determine attainment of the PPWS beneficial use, samples must be taken within 5 stream miles of a drinking water intake.

TOXICANTS

A minimum of ten (10) samples is required to make an attainment determination.

The PPWS beneficial use is considered *attained with respect to any individual toxicant* for which there is a water quality criterion established if:

10% or fewer of the samples have concentrations of a toxicant that exceed the criterion for that toxicant

and

No drinking water use restrictions related to source water contamination are in effect

The PPWS beneficial use is considered *not attained with respect to any individual toxicant* for which there is a water quality criterion established if:

More than 10% of the samples have concentrations of a toxicant that exceed the criterion for that toxicant

or

A drinking water use restriction related to source water contamination is in effect.

TOTAL COLIFORM

A minimum of ten (10) samples is required to make an attainment determination.

In order to determine attainment of the PPWS beneficial use, samples must be taken within 5 stream miles of a drinking water intake.

The following numerical criterion shall be used to make attainment decisions for bacteria:

- 5000 colonies/100 mL

The PPWS beneficial use is considered *attained with respect to bacteria* if:

The numerical criterion yields a determination of "fully supporting" using the default protocol

or

The numerical criterion yields a determination of "fully supporting but threatened" using the default protocol if the threat will not yield a determination of other than fully supporting within two years of the determination.

or

The Primary Body Contact Recreation use is attained

The PPWS beneficial use is considered *not attained with respect to bacteria* if:

The numerical criterion yields a determination of "not supporting" using the default protocol.

or

The numerical criterion yields a determination of "fully supporting but threatened" using the default protocol ***if*** the threat will yield a determination of other than fully supporting within two years of the determination.

OIL & GREASE

A minimum of ten (10) visual observations made over a period of at least ten (10) months is required to make an attainment determination.

Any of the following visual characteristics shall indicate the presence of oil or grease:

- a rainbow sheen that flows when stirred, rather than crackling
- a golden tan to dark brown coating or globules on the water or in stream sediment

The PPWS beneficial use is considered *attained with respect to oil & grease* if 10% or fewer observations reveal the presence of oil or grease.

The PPWS beneficial use is considered *not attained with respect to oil & grease* if more than 10% of the observations reveal the presence of oil or grease.

PARAMETERS NOT ASSESSED AND NOT LIKELY TO OCCUR OR VIOLATE CRITERIA

The data required to assess every water quality criterion associated with PPWS does not always exist for a particular waterbody. In those cases, the following procedure should be followed in order to make an attainment decision.

For parameters not assessed or which are not likely to occur or violate criteria, attainment decisions should be made based on two kinds of information:

1. The results of analysis of chemical-specific parameters routinely monitored by the State's Beneficial Use Monitoring Program (BUMP) as compared to state criteria associated with PPWS
2. The results of a review of watershed-specific landuse and historical data that yields patterns of use for the pollutant in question

The PPWS beneficial use is considered *attained with respect to unassessed parameters* if:

The waterbody is attaining the PPWS use for BUMP parameters according to the Toxicants section of this listing methodology.

and

No suspicion of the presence of the unassessed parameters exists based on landuse and historical data review.

CHLOROPHYLL-α AND PHOSPHORUS

Certain water supplies have specific criteria for chlorophyll-α and/or total phosphorus as specified in OAC 785:45-5-10(7) and (8). Attainment of these criteria will be evaluated using the specified criteria and the long-term average default protocol.

EMERGENCY WATER SUPPLY (EWS)

All waterbodies designated with the Emergency Water Supply beneficial use shall be deemed to be attaining the beneficial use for all water quality related issues.

AGRICULTURE

A minimum of ten (10) samples is required to make an attainment determination.

TDS

The Agriculture beneficial use is considered *attained with respect to TDS* if:

No TDS sample exceeds 700 mg/l

or

The mean of all TDS samples does not exceed the yearly mean standard (YMS) for TDS as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

and

10% or fewer TDS samples exceed the sample standard (SS) for TDS as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

The Agriculture beneficial use is considered *not attained with respect to TDS* if:

At least one TDS sample exceeds 700 mg/l

and

More than 10% of the samples exceed the sample standard (SS) for TDS as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

or

The mean of all samples exceeds the yearly mean standard (YMS) for TDS as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

CHLORIDES

The Agriculture beneficial use is considered *attained with respect to chlorides* if:

No chloride sample exceeds 250 mg/l

or

The mean of all samples does not exceed the yearly mean standard (YMS) for chlorides as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E)

and

10% or fewer samples exceed the sample standard (SS) for chlorides as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

The Agriculture beneficial use is considered *not attained with respect to chlorides* if:

At least one chloride sample exceeds 250 mg/l

and

More than 10% of the samples exceed the sample standard (SS) for chlorides as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

or

The mean of all samples exceeds the yearly mean standard (YMS) for chlorides as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific/watershed-specific criteria.

SULFATES

The Agriculture beneficial use is considered *attained with respect to sulfates* if:

No sulfate sample exceeds 250 mg/l

or

The mean of all samples does not exceed the yearly mean standard (YMS) for sulfates as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

and

10% or fewer samples exceed the sample standard (SS) for sulfates as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

The Agriculture beneficial use is considered *not attained with respect to sulfates* if:

At least one sulfate sample exceeds 250 mg/l

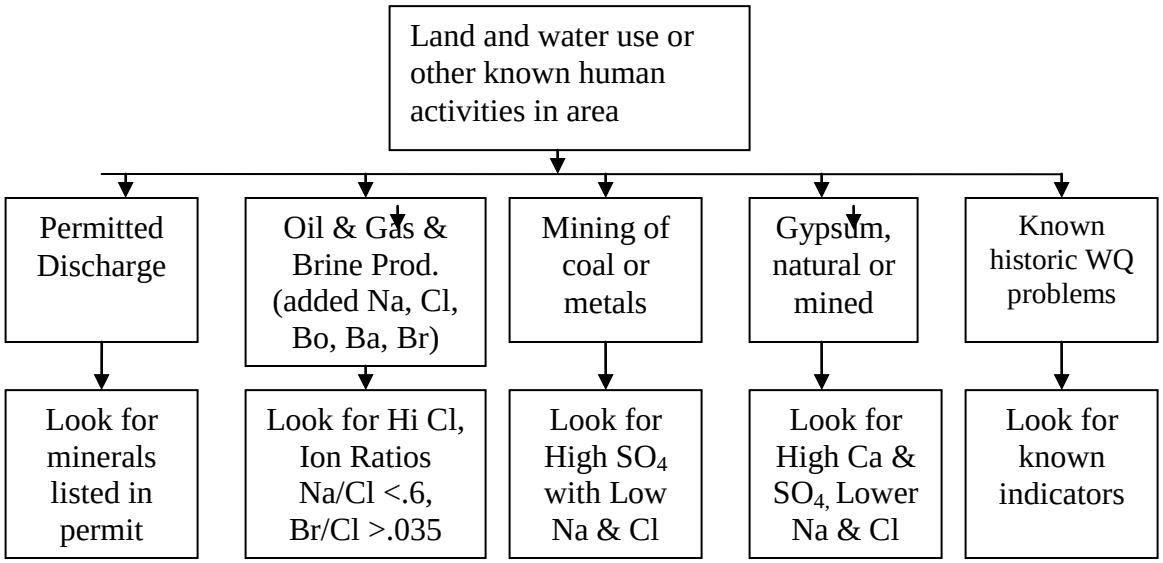
and

More than 10% of the samples exceed the sample standard (SS) for sulfates as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E)

or

The mean of all samples exceeds the yearly mean standard (YMS) for sulfates as listed in the Oklahoma Water Quality Standards (OAC 785:45 Appendix F) or site-specific criteria (OAC 785:45 Appendix E).

To help determine when streams are adversely impacted by human activity, the following decision tree shall be used:



NAVIGATION

All waterbodies designated with the Navigation beneficial use shall be deemed to be attaining the beneficial use for all water quality related issues.

AESTHETICS

NUTRIENTS

The Aesthetics beneficial use is considered *attained with respect to nutrients* if a nutrient impairment study yields a result of "fully supporting."

The Aesthetics beneficial use is considered *not attained with respect to nutrients* if a nutrient impairment study yields a result of "impaired."

Only a nutrient impairment study may be used to make a determination of *not attained* for aesthetics with respect to nutrients.

WADABLE STREAMS

The aesthetics beneficial use for wadable streams is considered *attained with respect to nutrients* if application of the dichotomous process or application of the alternative to dichotomous process specified in OAC 785:46-15-10 yields a result of "not threatened."

LAKES AND NONWADABLE STREAMS

The aesthetics beneficial use for lakes and nonwadable streams is considered *attained with respect to nutrients* if planktonic chlorophyll-α values in the water column indicate a Carlson's Trophic State Index of less than 62.

PHOSPHORUS

The phosphorus water quality standard applies to waters designated as a Scenic River.

A minimum of ten (10) samples is required to make an attainment determination. Samples must meet the data requirements of OAC 785:46-15-10(h)(2).

Attainment decisions will be made using the procedure specified in OAC 785:46-15-10(h).

OIL & GREASE

A minimum of ten (10) visual observations made over a period of at least ten (10) months is required to make an attainment determination.

Any of the following visual characteristics shall indicate the presence of oil or grease:

- A rainbow sheen that flows when stirred, rather than crackling
- A golden tan to dark brown coating or globules on the water or in stream sediment

The aesthetics beneficial use is considered *attained with respect to oil & grease* if 10% or fewer observations reveal the presence of oil or grease.

The aesthetics beneficial use is considered *not attained with respect to oil & grease* if more than 10% of the observations reveal the presence of oil or grease.

COLOR

If persistent coloring materials that produce an aesthetically unpleasant appearance are not observed and no public complaints regarding such are registered for a waterbody, the waterbody shall be considered fully supporting of the aesthetics beneficial use with regard to color.

If coloring materials that produce an aesthetically unpleasant appearance are observed, and they are determined to be from natural sources, the waterbody shall be considered fully supporting of the aesthetics beneficial use with regard to color. Natural sources may be determined by the process of elimination. If no point or substantial nonpoint sources discharges known to affect waterbody color are present in the watershed then the remaining sources are considered natural.

Color from other than natural sources shall be assessed using the long term average default methodology outlined in OAC 785:46 15-4(c).

Where color attributed to point or substantial nonpoint sources exceeds the criteria then the waterbody shall be deemed impaired by color.

FISH CONSUMPTION

The Fish Consumption beneficial use is considered *attained* if:

The numerical criteria for fish consumption in the Oklahoma Water Quality Standards [OAC 785:45-5-20(b)] yields a determination of "fully supporting" using the default protocol for long-term average numerical parameters

or

The numerical criteria for fish consumption in the Oklahoma Water Quality Standards [OAC 785:45-5-20(b)] yields a determination of "fully supporting but threatened" using the default protocol for long-term average numerical parameters if the threat will not yield a determination of other than fully supporting within two years of the determination.

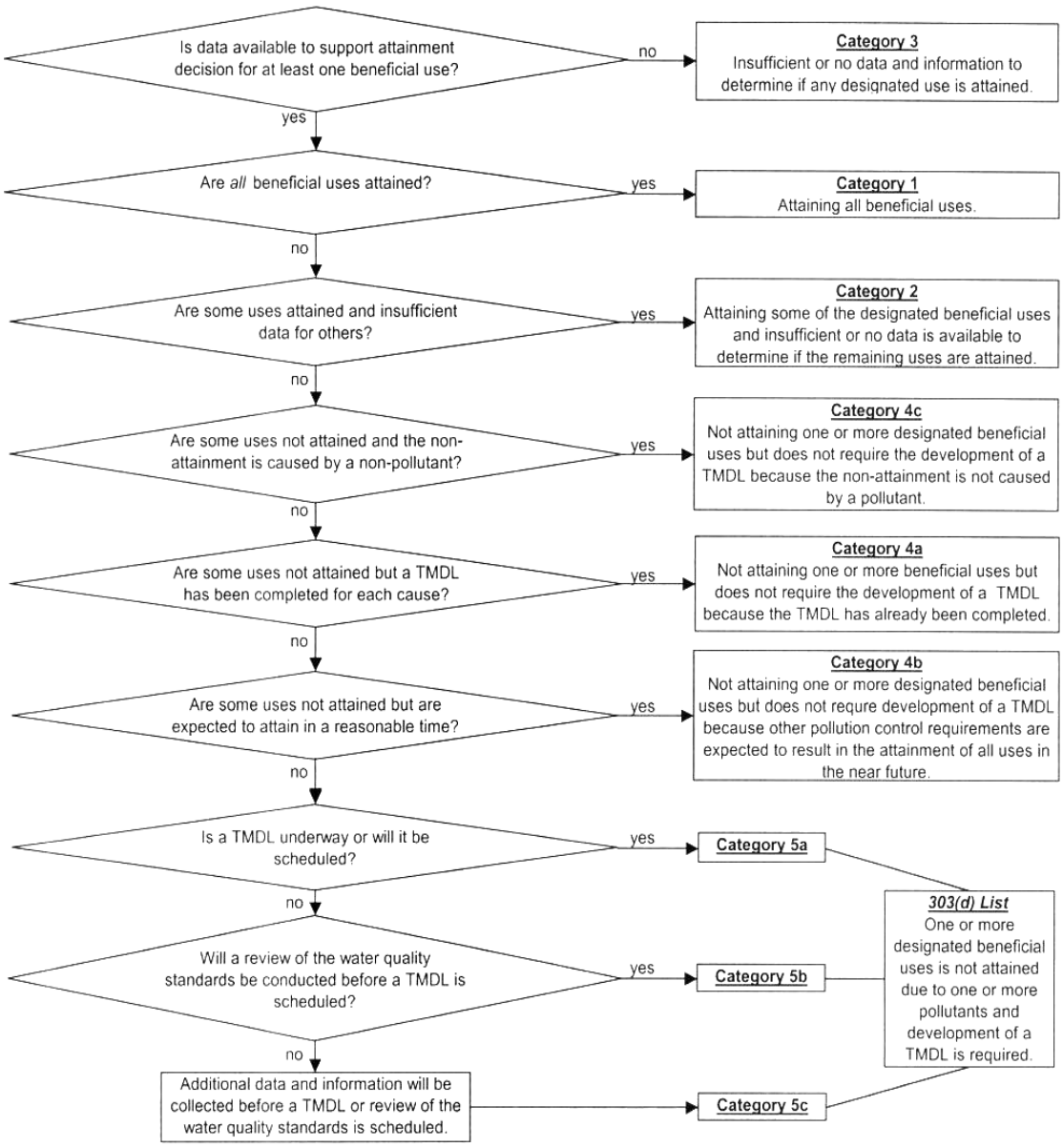
The Fish Consumption beneficial use is considered *not attained* if any of the following conditions apply:

- The numerical criteria for fish consumption in the Oklahoma Water Quality Standards [OAC 785:45-5-20(B)] yields a determination of "not supporting" or "partially supporting" using the default protocol for long-term average numerical parameters.
- A site-specific consumption restriction is imposed
- A site-specific fish or shellfish ban is in effect for a sub-population thereof
- A site-specific aquatic life closure is in effect
- A site-specific "no consumption" advisory is in effect

CATEGORY DECISION METHODOLOGY

The Integrated Water Quality Report contains five categories that describe different levels of beneficial use attainment in each of the State's waters. Each waterbody should be assessed for attainment of each of its individual designated beneficial uses using the methodology outlined above. Following that assessment, the decision tree in Figure 13 should be used to assign each waterbody to an appropriate category.

FIGURE 13: INTEGRATED REPORT CATEGORY DECISION TREE



CAUSES OF NON-ATTAINMENT

The previous methodology outlines the procedures for determining attainment of each of a waterbody's designated beneficial uses. Causes of non-attainment must also be included in the State's Integrated Water Quality Assessment Report.

The following causes and cause codes should be applied where applicable to each waterbody upon making a determination of non-attainment for any given designated beneficial use or subcategory of that use. Additional cause codes may be added to the State's Integrated Report in order to provide for numerical criteria in the State's Water Quality Standards not already represented with a cause code.

TABLE 22: CAUSES OF NON-ATTAINMENT

Cause Code	CAUSE OF NON-ATTAINMENT
1	α-BHC
2	α-Endosulfan (Endosulfan 1)
3	β-BHC
4	β-Endosulfan (Endosulfan 2)
5	δ-BHC
6	1,1,1,2-Tetrachloroethane
7	1,1,1-Trichloroethane
8	1,1,2,2-Tetrachloroethane
9	1,1,2-Trichloroethane
10	1,1-Dichloro-1,2,2-trifluoroethane
11	1,1-Dichloroethane
12	1,2,3,4-Tetrachlorobenzene
13	1,2,4,5-Tetrachlorobenzene
14	1,2,4-Trichlorobenzene
15	1,2,4-Trimethylbenzene
16	1,2-Butylene oxide
17	1,2-Dibromo-3-chloropropane
18	1,2-Dibromo-3-chloropropane (DBCP)
19	1,2-Dichloroethane
20	1,2-Dichloroethylene
21	1,2-Dichloropropane
22	1,2-Diphenylhydrazine
23	1,3-Butadiene
24	1,3-Dichloropropene
25	1,4-Dioxane
26	2,2'-Dichlorodiethyl ether
27	2,2'-Dichlorodiisopropyl ether
28	2,3,7,8-Tetrachlorodibenzofuran
29	2,3-Dichloropropene
30	2,4,5-TP (Silvex)
31	2,4,5-Trichlorophenol
32	2,4,5-Trichlorophenol
33	2,4,6-Trichlorophenol
34	2,4-D
35	2,4-Diaminotoluene
36	2,4-Dichlorophenol

Cause Code	CAUSE OF NON-ATTAINMENT
37	2,4-Dimethylphenol
38	2,4-Dinitrophenol
39	2,4-Dinitrotoluene
40	2,5-Dichlorophenol
41	2,6-Dinitrotoluene
42	2-Acetylaminofluorene
43	2-Chloroethyl vinyl ether
44	2-Chloronaphthalene
45	2-Chlorophenol
46	2-Ethoxyethanol
47	2-Methoxyethanol
48	2-Methylnaphthalene
49	2-Methylpyridine
50	2-Nitrophenol
51	3,3'-Dichlorobenzidine
52	3,3'-Dimethoxybenzidine
53	3,3'-Dimethylbenzidine
54	3,4-Dichlorophenol
55	3-Chlorophenol
56	4,4'-Isopropylidenediphenol
57	4,4'-Methylenebis
58	4,4-Dichloro-2-butene
59	4-Aminobiphenyl
60	4-Bromophenylphenyl ether
61	4-Chloro-3-methylphenol (3-Methyl-4-Chlorophenol)
62	4-Chlorophenol
63	4-Dimethylaminoazobenzene
64	4-Methylphenol
65	4-Nitrophenol
66	5-Nitro-o-toluidine
67	Abnormal Fish Histology (Lesions)
68	Acenaphthene
69	Acenaphthylene
70	Acetaldehyde
71	Acetamide
72	Acetochlor
73	Acetonitrile
74	Acrolein
75	Acrylamide
76	Acrylonitrile
77	Alachlor
78	Aldicarb
79	Aldrin
80	Alkalinity, Carbonate as CaCO3
81	Allyl alcohol

Cause Code	CAUSE OF NON-ATTAINMENT
82	Allyl chloride
83	Alpha particles
84	Alteration in stream-side or littoral vegetative covers
85	Alterations in wetland habitats
86	Alum (aluminum Sulfate)
87	Aluminum
88	Ambient Bioassays -- Acute Aquatic Toxicity
89	Ambient Bioassays -- Chronic Aquatic Toxicity
90	Amitrole
91	Ammonia (Unionized)
92	Amnesic shellfish poisoning (ASP) biotoxins
93	Aniline
94	Anthracene
95	Antimony
96	Arsenic
97	Asbestos
98	Atlantic Sea Lamprey, Petromyzon marinus
99	Atrazine
100	BOD, Biochemical oxygen demand
101	BOD, carbonaceous
102	BOD, nitrogenous
103	BOD, sediment load (Sediment Oxygen Demand)
104	Barium
105	Benthic-Macroinvertebrate Bioassessments (Streams)
106	Benzal chloride
107	Benzene
108	Benzidine
109	Benzo(a)pyrene (PAHs)
110	Benzo[a]anthracene
111	Benzo[b]fluoranthene
112	Benzo[g,h,i]perylene
113	Benzo[k]fluoranthene
114	Benzoic Acid
115	Benzoyl chloride
116	Benzyl chloride
117	Beryllium
118	Beta particles and photon emitters
119	Biphenyl
120	Bis(2-Chloroethoxy)methane
121	Bis(2-chloro-1-methylethyl)
122	Bis(n-octyl) phthalate
123	Boron
124	Bromoform
125	Butyl benzyl phthalate
126	Butyraldehyde

Cause Code	CAUSE OF NON-ATTAINMENT
127	Cadmium
128	Captan
129	Carbaryl
130	Carbofuran
131	Carbon Disulfide
132	Carbon tetrachloride
133	Cesium
134	Chemical oxygen demand (COD)
135	Chloramben
136	Chloramines
137	Chlordane
138	Chloride
139	Chlorine
140	Chlorine dioxide (as ClO_2)
141	Chloroacetic acid
142	Chlorobenzene (mono)
143	Chlorobenzilate
144	Chlorodibromomethane
145	Chlorodifluoromethane
146	Chloroethane
147	Chloroform
148	Chloromethyl methyl ether
149	Chlorophenyl-4 phenyl ether
150	Chlorophyll-α
151	Chloroprene
152	Chlorothalonil
153	Chlorpyrifos
154	Chromium (total)
155	Chromium, hexavalent
156	Chromium, trivalent
157	Chrysene (C1-C4)
158	Ciguatera fish poisoning (CFP) biotoxins
159	Cobalt
160	Color
161	Combination Benthic/Fishes Bioassessments (Streams)
162	Combined Biota/Habitat Bioassessments (Streams)
163	Copper
164	Creosote
165	Cresol (mixed isomers)
166	Cryptosporidium
167	Cumene
168	Cyanide
169	Cyanide (as free cyanide)
170	Cyanobacteria hepatotoxic microcystins
171	Cyanobacteria hepatotoxic nodularins

Cause Code	CAUSE OF NON-ATTAINMENT
172	Cyanobacteria neurotoxic anatoxins
173	Cyanobacteria neurotoxic saxitoxins
174	Cyclohexane
175	DDD
176	DDE
177	DDT
178	DEHP (Di-sec-octyl phthalate)
179	Dacthal
180	Dalapon
181	Debris/Floatables/Trash
182	Demeton
183	Di(2-ethylhexyl) adipate
184	Diallate
185	Diaminotoluene (mixed isomers)
186	Diarrhetic shellfish poisoning (DSP) biotoxins
187	Diazinon
188	Dibenz[a,h]anthracene
189	Dibenzofuran
190	Dibutyl phthalate
191	Dichlorobenzene (mixed isomers)
192	Dichlorobromomethane
193	Dichlorodifluoromethane
194	Dichloromethane
195	Dichlorotrifluoroethane
196	Dichlorvos
197	Dicofol
198	Dieldrin
199	Diethyl phthalate
200	Dimethyl phthalate
201	Dinitro-o-cresol
202	Dinoseb
203	Dioxin (including 2,3,7,8-TCDD)
204	Diquat
205	Dissolved oxygen saturation
206	Disulfoton
207	Diuron
208	Dyfonate (Fonofos or Fonophos)
209	EPTC
210	Endosulfan
211	Endosulfan sulfate
212	Endothall
213	Endrin
214	Endrin aldehyde
215	Enterococcus
216	Epichlorohydrin

Cause Code	CAUSE OF NON-ATTAINMENT
217	Escherichia coli
218	Estuarine Bioassessments
219	Ethelyne dibromide
220	Ether, bis Chloromethyl
221	Ethylbenzene
222	Ethylene
223	Ethylene Glycol
224	Ethylene oxide
225	Ethylene thiourea
226	Eurasian Water Milfoil, Myriophyllum spicatum
227	Excess Algal Growth
228	Fish Barriers (Fish Passage)
229	Fish Kills
230	Fishes Bioassessments (Streams)
231	Fluometuron
232	Fluoranthene
233	Fluorene
234	Fluoride
235	Foam/Flocs/Scum
236	Formaldehyde
237	Formic acid
238	Furan Compounds
239	Giardia lamblia
240	Glyphosate
241	Gold
242	Guthion
243	Habitat Indicator Bioassessments (Streams)
244	Heptachlor
245	Heptachlor epoxide
246	Hexachlorobenzene
247	Hexachlorobutadiene
248	Hexachlorocyclohexane
249	Hexachlorocyclohexane
250	Hexachlorocyclohexane (mixture)
251	Hexachlorocyclopentadiene
252	Hexachloroethane
253	Hexachlorophene
254	Hexamethylphosphoramide
255	Hydrazine
256	Hydrochloric acid
257	Hydrogen cyanide
258	Hydroquinone
259	Indeno[1,2,3-cd]pyrene
260	Iron
261	Isobutyraldehyde

Cause Code	CAUSE OF NON-ATTAINMENT
262	Isophorone
263	Isopropanol
264	Isosafrole
265	Kepone
266	Lake Bioassessments
267	Lead
268	Lindane
269	Linuron
270	Low flow alterations
271	Malathion
272	Maleic anhydride
273	Manganese
274	Mercury
275	Methacrylonitrile
276	Methanol
277	Methoxychlor
278	Methyl Parathion
279	Methyl Tertiary-Butyl Ether (MTBE)
280	Methyl bromide
281	Methyl chloride
282	Methyl ethyl ketone
283	Methyl hydrazine
284	Methyl iodide
285	Methyl isobutyl ketone
286	Methyl methacrylate
287	Methylene bromide
288	Methylmercury
289	Mirex
290	Molinate
291	Molybdenum
292	N-Nitroso-N-ethylurea
293	N-Nitroso-N-methylurea
294	N-Nitrosodimethylamine
295	N-Nitrosodiphenylamine
296	N-Nitrosodipropylamine
297	N-Nitrosomorpholine
298	N-Nitrosopiperidine
299	Naphthalene
300	Neurotoxic shellfish poisoning (NSP) biotoxins
301	Nickel
302	Nitrates
303	Nitrilotriacetic acid
304	Nitrobenzene
305	Nitrodibutylamine,N
306	Nitrofen

Cause Code	CAUSE OF NON-ATTAINMENT
307	Nitrogen, Nitrite
308	Nitrogen, ammonia
309	Nitroglycerin
310	Nitrosamines
311	Nitrosodiethylamine,N
312	Non-Native Aquatic Plants
313	Non-Native Fish/Shellfish/Zooplankton Species
314	Octachlorostyrene
315	Octochloronaphthalene
316	Odor threshold number
317	Oil and Grease
318	Other anthropogenic substrate alterations
319	Other flow regime alterations
320	Oxadiazon
321	Oxamyl (Vydate)
322	Oxygen, Dissolved
323	PCB-1242
324	PCB-1248
325	PCB-1254
326	PCB-1260
327	Paraldehyde
328	Paralytic shellfish poisoning (PSP) biotoxins
329	Parathion
330	Partial pressure of dissolved gases
331	Particle distribution (Embeddedness)
332	Pentachlorobenzene
333	Pentachloroethane
334	Pentachlorophenol (PCP)
335	Perchlorate
336	Periphyton (Aufwuchs) Indicator Bioassessments (Streams)
337	Phenanthrene
338	Phenol
339	Phenols
340	Phosphate
341	Phosphorus, Elemental
342	Photomirex
343	Phthalic anhydride
344	Physical substrate habitat alterations
345	Picloram
346	Picric acid
347	Polybrominated Biphenyls
348	Polychlorinated biphenyls
349	Prometon (Prometone)
350	Pronamide
351	Propanil (DCPA mono- and di-acid degrad

Cause Code	CAUSE OF NON-ATTAINMENT
352	Propionaldehyde
353	Propoxur
354	Propylene Glycol
355	Propylene oxide
356	Pyrene
357	Pyridine
358	Quinoline
359	Quinone
360	Quintozene
361	RDX
362	Radium
363	Radium 226
364	Radium 228
365	Riparian Habitat Alteration
366	Safrole
367	Salinity
368	Secchi disk transparency
369	Sediment Bioassays -- Chronic Toxicity -- Freshwater
370	Sediment Bioassays for Estuarine and Marine Water
371	Sedimentation/Siltation
372	Selenium
373	Silica
374	Silicate
375	Silver
376	Simazine
377	Sodium
378	Solids (Suspended/Bedload)
379	Specific Conductance
380	Stream bank alterations
381	Streptococcus, fecal
382	Strontium
383	Styrene
384	Styrene oxide
385	Sulfates
386	Sulfide-Hydrogen Sulfide
387	Suspended Algae
388	Temperature, water
389	Terbacil
390	Terbufos
391	Tetrachloroethylene
392	Tetrachlorvinphos
393	Thallium
394	Thiourea
395	Tin
396	Toluene

Cause Code	CAUSE OF NON-ATTAINMENT
397	Total Benzofluoranthenes
398	Total Coliform
399	Total Dissolved Solids
400	Total Fecal Coliform
401	Total Kjehldahl Nitrogen (TKN)
402	Total Organic Carbon (TOC)
403	Total Suspended Solids (TSS)
404	Total Trihalomethane (TTHM)
405	Toxaphene
406	Tributylin TBT (Tributylstanne)
407	Trichlorfon
408	Trichloroethylene
409	Trichlorofluoromethane (CFC-11)
410	Triethylene Glycol Dichloride
411	Trifluralin
412	Trophic State Index
413	Turbidity
414	Uranium
415	Vanadium (fume or dust)
416	Vinyl acetate
417	Vinyl bromide
418	Vinyl chloride
419	Vinylidene chloride
420	Viruses (enteric)
421	Xylenes (total) (mixed)
422	Zebra mussel, Dreissena polymorph
423	Zinc
424	Zineb
425	alpha-Naphthylamine
426	beta-Naphthylamine
427	cis-1,2-Dichloroethylene
428	m-Cresol
429	m-Dichlorobenzene
430	m-Dinitrobenzene
431	m-Xylene
432	n-Butyl alcohol
433	o-Cresol (2-Methylphenol)
434	o-Dichlorobenzene
435	o-Toluidine
436	o-Toluidine hydrochloride
437	o-Xylene
438	p-Dichlorobenzene
439	p-Phenylenediamine
440	p-Xylene
441	pH

Cause Code	CAUSE OF NON-ATTAINMENT
442	sec-Butyl alcohol
443	tert-Butyl alcohol
444	trans-1,2-Dichloroethylene
458	Total Nitrogen as N
462	Total Phosphorus
463	Impairment Unknown

SOURCES OF NON-ATTAINMENT

Sources are the activities, facilities, or conditions that contribute pollutants or stressors resulting in impairment of designated uses in a waterbody.

Determining the sources of designated use impairment can be a difficult process. Ambient monitoring data can give good evidence of the causes of impairment. In some cases, field observations can provide information on obvious, nearby problems; e.g., land use, substrate, and habitat may provide a basis for identifying sources. This is especially the case for "hydromodification" sources.

In most cases, additional information is needed – watershed land use inventories, records of permit compliance, locations of areas with highly erodible soils, areas with poor BMP (best management practice) implementation, measurements of in-place contaminants, or loadings from atmospheric transport or ground water.

A partial list of sources is shown below. Other source codes may be added as the need arises. Table 23 provides guidance on how to determine sources of impairment for various categories.

TABLE 23: GUIDANCE ON DETERMINING SOURCES OF IMPAIRMENT

Source Code	Guidance on Determing Sources of Impairment
1	Above ground storage tank leaks (tank farms)
2	Acid mine drainage
3	Airports
4	Animal feeding operations (nps)
5	Animal shows and racetracks
6	Aquaculture (not permitted)
7	Aquaculture (permitted)
8	Atmospheric depositon - acidity
9	Atmospheric depositon - nitrogen
10	Atmospheric depositon - toxics
11	Auction barns
12	Ballast water releases
13	Baseflow depletion from groundwater withdrawals
14	Brownfield (non-NPL) sites
15	Cargo loading/unloading
16	CERCLA NPL (Superfund) sites
17	Changes in ordinary stratification and bottom water hypoxia/anoxia
18	Changes in tidal circulation/flushing
19	Channel erosion/incision from upstream hydromodifications
20	Channelization
21	Clean sediments
22	Coal mining discharges (permitted)
23	Combined sewer overflows

Source Code	Guidance on Determing Sources of Impairment
24	Commercial districts (industrial parks)
25	Commercial ferries
26	Commerical districts (shopping/office complexes)
27	Construction stormwater discharge (permitted)
28	Contaminated sediments
29	Cooling water intake stuctures (impingement or entrainment)
30	Crop production with subsurface drainage
31	Dairies (outside milk parlor areas)
32	Dam construction (other than upstream flood control projects)
33	Discharges from biosolids (sludge) storage, application or disposal
34	Discharges from Municipal Separate Storm Sewer Systems (MS4)
35	Discharges from offshore oil & gas exploration (permitted)
36	Drainage/filling/loss of wetlands
37	Dredge mining
38	Dredging (e.g., for navigation channels)
39	Drought-related impacts
40	Dry weather flows with NPS pollutants
41	Erosion from derelict land (barren land)
42	Flow alterations from water diversions
43	Forest roads (road construction and use)
44	Freshets or major flooding
45	Golf courses
46	Grazing in riparian or shoreline zones
47	Hardrock mining discharges (permitted)
48	Heap-leach extraction mining
49	Highway/road/bridge runoff (non-construction related)
50	Highways, roads, bridges, infrasturcture (new construction)
51	Historic bottom deposits (not sediment)
52	Hydrostructure impacts on fish passage
53	Illegal dumping
54	Illegal dumps or other inappropriate waste disposal
55	Illicit connections/hook-ups to storm sewers
56	Impacts from abandoned mine lands (inactive)
57	Impacts from geothermal development
58	Impacts from hydrostructure flow regulation/modification
59	Impacts from land application of wastes
60	Impacts from resort areas (winter and non-winter resorts)
61	Industrial land treatment
62	Industrial point source discharge
63	Industrial thermal discharges
64	Industrial/commercial site stormwater discharge (permittted)
65	Internal nutrient recycling
66	Irrigated crop production
67	Land application of wastewater (non-agricultural)
68	Land application of wastewater biosolids (non-agricultural)
69	Landfills
70	Leaking underground storage tanks

Source Code	Guidance on Determing Sources of Impairment
71	Littoral/shore area modifications (non-riverine)
72	Loss of riparian habitat
73	Managed pasture grazing
74	Marina boat construction
75	Marina boat maintenance
76	Marina dredging operations
77	Marina fueling operations
78	Marina-related shoreline erosion
79	Marina/boating pumpout releases
80	Marina/boating sanitary on-vessel discharges
81	Mill tailings
82	Mine tailings
83	Mountaintop mining
84	Municipal (urbanized high density area)
85	Municipal point source discharges
86	Municipal point source impacts from inadequate industrial/commercial pretreatment
87	Non-irrigated crop production
88	Non-metals mining discharges (permitted)
89	NPS pollution from military base facilities (other than port facilities)
90	NPS pollution from military port facilities
91	Off-road vehicles
92	On-site treatment systems (septic systems and similar decencentralized systems)
93	Open pit mining
94	Other marina/boating on-vessel discharges
95	Other recreational pollution sources
96	Other shipping releases (wastes and detritus)
97	Other spill related impacts
98	Other turf management
99	Package plant or other permitted small flows discharges
100	Permitted runoff from Concentrated Animal Feeding Operations (CAFOs)
101	Permitted silvicultural activities
102	Petroleum/natural gas activities (legacy)
103	Petroleum/natural gas production activities (permitted)
104	Pipeline breaks
105	Placer mining
106	Pollutants from public bathing areas
107	Post-development erosion and sedimentation
108	Rangeland (unmanaged pasture) grazing
109	Rcra hazardous waste sites
110	Releases from waste sites or dumps
111	Residential districts
112	Salt storage sites
113	Saltwater intrusion from groundwater overdrafting
114	Sand/gravel/rock mining or quarries
115	Sanitary sewer overflows (collection system failures)
116	Septage disposal
117	Shipbuilding, repairs, drydocking

Source Code	Guidance on Determing Sources of Impairment
118	Silviculture - large scale (industrial) unpermitted forestry
119	Silviculture harvesting
120	Silviculture plantation management
121	Silviculture reforestation
122	Site clearance (land development or redevelopment)
123	Speciality crop production
124	Spills from trucks or trains
125	Streambank modifications/destablization
126	Subsurface (hardrock) minining
127	Surface mining
128	Total retention domestic sewage lagoons
129	Uic wells (underground injection control wells)
130	Unpermitted discharge (domestic wastes)
131	Unpermitted discharge (industrial/commercial wastes)
132	Upstream impoundments (e.g., PL-566 NRCS structures)
133	Wastes from pets
134	Waterfowl
135	Wet weather discharges (point source and combination of stormwater, SSO or CSO)
136	Wildlife other than waterfowl
137	Woodlot site clearance
138	Woodlot site management
139	Yard maintenance

TABLE 24: USEFUL INFORMATION IN DETERMINING SOURCES OF BENEFICIAL USE NON-ATTAINMENT

Source Category	Example Types of Information
INDUSTRIAL POINT SOURCES	Permit compliance records • analysis of DMRs • compliance monitoring or special monitoring in permits • WET or TIE bioassay tests Monitoring/modeling studies • upstream/downstream chemical, biological, and habitat monitoring • intensive surveys combined with WLA/TMDL modeling • complaint investigations • data from volunteer monitoring
MUNICIPAL POINT SOURCES	Permit compliance records • analysis of routine DMRs • compliance monitoring or special monitoring in permits • WET or TIE toxicity bioassay tests Monitoring/modeling studies • upstream/downstream chemical, biological, and habitat monitoring • intensive surveys combined with WLA/TMDL modeling • complaint investigations • data from volunteer monitoring

Source Category	Example Types of Information
COMBINED SEWER OVERFLOWS (CSOs)	Permit compliance records • records of nonachievement of targets for frequency of wet weather overflows • implementation of other minimum control and pollution prevention methods (as in EPA CSO Control Policy) Monitoring/modeling studies • upstream/downstream chemical, biological, or physical monitoring comparing wet weather and normal flow conditions • intensive surveys combined with WLA/TMDL modeling • complaint investigations
AGRICULTURAL POINT SOURCES (e.g., CAFOs)	Permit compliance records • observation of overflows from total retention (non-discharge) facilities • compliance with provisions for off-site disposal of animal wastes (e.g., land application, composting) Monitoring studies • upstream/downstream chemical, biological, or physical monitoring (especially for nutrients and pathogens) • complaint investigations
AGRICULTURE (NPS)	Information from monitoring and field observations (e.g., to document bad actors) • edge of field monitoring of runoff from animal holding areas, cropped areas, or pastures • monitoring of inputs from irrigation return flows, sub-surface drains, or drainage ditches • proper installation of screens or other measures to avoid fish losses in drainage/irrigation ditches • serious rill or gully erosion in agricultural fields • sedimentation problems in agricultural watersheds • indications of unmanaged livestock in streamside management zones • complaint investigations or data from volunteer monitoring or inventories Records on watershed BMP implementation status • documented low implementation level (e.g., less than a 70% target) of recommended water quality BMPs • documented problems with specific agricultural operators Modeling • use of such models as AGNPS, SWAT or ANSWERS to estimate pollutant loads and improvement from BMP implementation • intensive surveys combined with WLA/TMDL modeling
SILVICULTURE (NPS)	Monitoring and field observations documenting instances of high sediment delivery to receiving waters • BMPs not followed on logging road, skid paths, or stream crossings • BMPs not followed t o protect streamside management zones • serious sedimentation problems (cobble embeddedness or interstitial D.O. problems) in watersheds that are largely silvicultural Records on watershed BMP/management measure) • implementation status • documented low implementation level of recommended water quality-oriented BMPs Results of modeling or cumulative effects analyses • use of such models as WRENSS to estimate pollutant loads and likely improvement from BMP implementation • use of water temperature models t o help quantify impacts on cold water fisheries • use of landscape analysis techniques (e.g., the RAPID method or Integrated Riparian Area Evaluation method) to document cumulative effects • intensive surveys combined with WLA/ TMDL modeling
CONSTRUCTION	Information from monitoring and field observations (primarily to document problem areas or bad actors) • sedimentation problems documented in watersheds with major construction activity • complaint investigations and volunteer monitoring data Information from sediment control management agencies • records of implementation of sediment control measures

Source Category	Example Types of Information
URBAN RUNOFF & STORM SEWERS	Monitoring/modeling studies • upstream/downstream chemical, biological, or habitat monitoring comparing wet weather and normal flow conditions near outfalls • special monitoring for BMP effectiveness-wet ponds, artificial wetlands, grass swales • intensive surveys combined with WLA/ TMDL modeling and catchment models such as SWMM • complaint investigations Information from management agencies • documented low implementation level of recommended/required water quality-oriented BMPs • documented problems with BMP operation and maintenance information from monitoring and field observations (primarily to document problem areas or bad actors)
RESOURCE EXTRACTION (Petroleum)	Information from monitoring and field observations (primarily to document problem areas or bad actors) • evidence of oil and brine spills affecting sizable areas near receiving waters; elevated TDS, toxicity, oil and grease aesthetic impacts; increased erosion and sedimentation problems • complaint investigations and volunteer monitoring data Information from petroleum management agencies • records of recurrent problems with spills, pipeline breaks, over-berming of reserve pits, waste-hauler dumping
RESOURCE EXTRACTION (mainly surface mining)	Information from monitoring and field observations (primarily to document problem areas or bad actors) • evidence of decreases in pH, toxicity from heavy metals, excessive sedimentation, or stream reaches with iron bacteria in watersheds with active mining • complaint investigations and volunteer monitoring data Information from mining management agencies • records of recurrent permit violations (e.g., over-berming of settling ponds, failure to contain leachates, or failure to revegetate or restore mined areas)
LAND DISPOSAL	Monitoring and field observations (primarily to document problem areas or bad actors) • monitoring indicates leachate migration from disposal area or industrial or domestic leach field failures • complaint investigations and volunteer monitoring Modeling • solute transport or plume models (e.g., PRIZM) indicate high potential for pollutants to reach receiving water
HYDROMODIFICATION : DAMS & FLOW REGULATION	Monitoring and field observations • recurring problems with inadequate instream flows (e.g., dewatering of streams, reduced pollutant assimilation, unnatural water temperatures) • documented interference with fish migration and spawning movements (e.g., for such anadromous fish as salmon or rockfish but also for inland fish that seek spawning habitat outside lakes or large rivers) Modeling • analysis using PHABSIM or other instream flow models to document adverse impacts • analysis related t o FERC permit renewal and State 401 Certification, habitat recovery plans under the ESA, or TMDL studies (e.g., problems with anoxic or nutrient-laden releases from hydrostructures)
HYDROMODIFICATION: OTHER (channelization, dredging, removal of riparian vegetation, streambank modification, draining/filling of wetlands)	Monitoring (usually over considerable period of time) documenting adverse changes: • severe channel downcutting or widening • elimination of vegetation in streamside management zones • excessive streambank erosion and sloughing • loss of significant wetland area in watershed • failure of wetland mitigation projects Modeling studies • decreases in pollutant assimilation from habitat modification • adverse impacts on hydrology, water temperatures, or habitat

Source Category	Example Types of Information
NATURAL	Monitoring and field observations of the presence of sources that are clearly not anthropogenic • saline water due to natural mineral salt deposits • low DO or pH caused by poor aeration and natural organic materials • excessive siltation due to glacial deposits • high temperatures due to low flow conditions or drought Note: the Natural Sources category should be reserved for waterbodies impaired due to naturally occurring conditions

PRIORITIZATION OF TMDL DEVELOPMENT & FUTURE MONITORING

After the final determination of beneficial use attainment is made, a four-level priority ranking for TMDL development will be established including waters targeted for TMDL development within the next two years (Priority 1). In accordance with EPA guidelines, priority determinations will take into account the severity of the impairments and the designated uses of the waters impacted. Waters in Category 5 (the State's 303(d) list) will be aggregated and prioritized according to their eleven digit hydrologic unit code (HUC11) watershed. The prioritization process will closely follow that used to develop the Unified Watershed Assessment except where changes are necessary due to programmatic and logistical differences between the two programs. Primary and secondary criteria were developed to evaluate and prioritize watersheds for TMDL development. The primary evaluation criteria used were the vulnerability of waters to degradation, the risks to public health and the threat to aquatic life.

A watershed's vulnerability for degradation was evaluated by first calculating the percentage of impaired waters for each HUC11 watershed based on the stream miles or equivalent stream miles (for lakes) listed as impaired divided by the total equivalent stream miles within the watershed. A Pollutant Priority Score was also developed and used based on a pairwise comparison matrix rank of all pollutant(s) and then calculating the mean of the values for those pollutants causing impairments within each watershed. The presence of protected waters or EQIP (Environmental Quality Incentive Program) local emphasis areas were also used to evaluate watershed vulnerability.

The threat to public health was also considered in the prioritization by evaluating both the population served by Public Water Supplies (PWS) and number of PWS intakes in the watershed. In both cases the more population served and the higher the number of intakes the more weight given to the risks to public health.

In assessing of the threats to aquatic life within a watershed consideration was given to the presence of threatened or endangered species along with the area of waters of recreational and/or ecological significance listed in Appendix B of the Oklahoma Water Quality Standards. Calculating the percent change in wetland area for each HUC11 watershed along with the presence of priority wetlands designated by the United States Fish and Wildlife Service were also used to evaluate the threats to aquatic life.

The outline below summarizes both the primary and secondary criteria used to establish the TMDL priority for each HUC11 watershed.

1) Vulnerability of waterbodies to degradation

a) Percent Stream Length/Lake Area Impaired

b) Pollutant Priority Score (Pairwise pollutant comparison rating)

c) Pristine Waters

i) Scenic Rivers

ii) Outstanding Resource Waters

iii) High Quality Waters

iv) Sensitive Water Supplies

d) EQIP Local Emphasis Area

2) Risks to public health

a) Public Water Supply Customers

b) Public Water Supply Intakes

3) Threat to aquatic life and other water-dependent wildlife

a) Presence of threatened and endangered species.

b) Area of Waters of Recreational and/or Ecological Significance (Appendix B)

c) Wetland Area

i) Presence of USFWS Priority Wetlands

ii) Change in Wetland Area

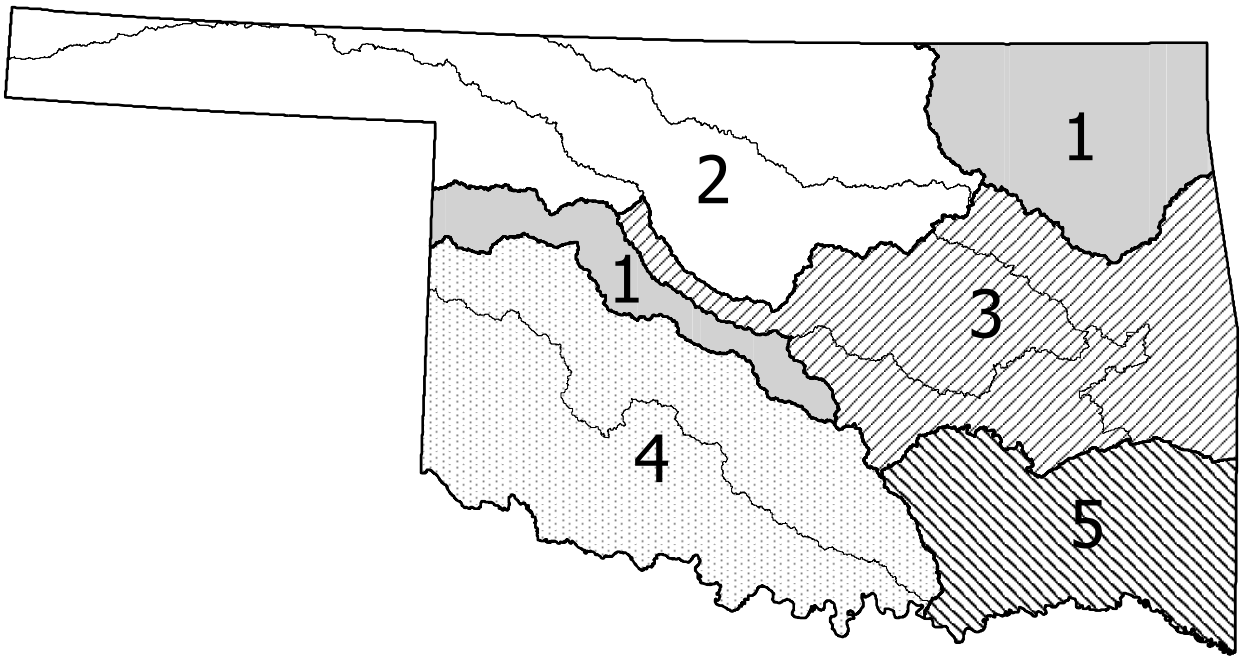
The priority ranking was established by giving each of the criteria above a ranking/points based on its overall importance. The criteria rankings or points were then totaled to give an overall score for each watershed. Table 25 below contains a more detailed summary of the actual weight given to each criterion.

TABLE 25: TMDL PRIORITIZATION-POINT RANKING

Points	Total Percent Impaired	Pollutant Priority Score	Wetland Percent Change	USFWS T&E Species	USFWS Wetland Priority	EQIP Local Emphasis Area	Highest Designated Protected Waterbody	Percent Appendix B Areas	PWS Intakes in HUC	PWS Customers Served
15	85	> 75th Quartile	>20%	≥ 3			Scenic R or ORW		≥ 4	≥ 100,000
10	65	Median to 75th Quartile	>10% to 20%	2			HQW		3	99,999 to 10,000
5	45	25th Quartile to Median	>5 to 10%	1	Yes	Yes	SWS	Upper 50th Percentile	2	9,999 to 1,000
3	25	< 25th Quartile	1 to 5%					Lower 50th Percentile	1	999 to 1
0	0	No Impairments	Gain or <1%		No	No		None	0	0

Where practicable, the State's Rotating Basin plan (Figure 14) will be used to schedule data collection projects in Category 2 & 3 waterbodies.

FIGURE 14: ROTATING BASIN PLAN WATERSHEDS BY YEAR



COORDINATION, REVIEW, AND APPROVAL

The Department of Environmental Quality (DEQ) is responsible for coordinating the development and submittal of the Integrated Water Quality Report. The process will begin with a notice and request for input sent to EPA Region 6, State environmental agencies, and Tribal environmental offices. A series of interagency meetings will be conducted to review the listing methodology, review and discuss the draft list along with priority rankings and scheduling, and facilitate the exchange of information. The draft list will be circulated to EPA Region 6 and State environmental agencies for comment prior to release for public participation.

Public participation will be undertaken in two phases. When the process to identify candidate waters is begun, nominations from the public will be solicited. This will involve the distribution of public announcements, articles for publication, posting on DEQ and/or other State environmental agency websites, and limited mailings. Once the final draft list is compiled, it is submitted for formal public review with notice and a 30-day comment period. Upon the close of the comment period, a responsiveness summary will be prepared. OSE will coordinate public participation activities. After the public review period and finalization of the list, it is formally submitted to EPA Region 6 for review and approval.

OKLAHOMA WATERBODY IDENTIFICATION (WBID) SYSTEM

The Oklahoma Waterbody Identification System is maintained by DEQ. Waterbody identification (WBID) numbers are established based on a waterbody's location in the State's Water Quality Management Plan. WBIDs are unique identifiers that offer a method of referencing waterbodies within the State of Oklahoma.

A complete WBID consists of a two-letter, fourteen-digit identifier.

The first two characters define the State code as required by EPA.

"**OK** ------ -- ----_--"

The next six digits are derived from Oklahoma's Water Quality Management Planning Basins. The State's seven large, one-digit planning basins are broken down into smaller basins, each identified with a six-digit number.

"OK **311500** -- ----_--"

Each six-digit basin is divided into a number of smaller sections that are identified by a two-digit number.

"OK 311500 **03** ----_--"

The next four digits of a WBID number were originally intended to represent a hydrologic sequence of waterbodies, going from the most downstream point in the eight-digit watershed up to the furthest upstream point in the watershed. These four digits were originally selected by tens (e.g., 0010, 0020, 0030). This provided for the addition of waterbodies while maintaining the hydrologic sequence as much as possible.

"OK 311500 03 **0010**_--"

The last two digits of a WBID number allow a waterbody to be segmented further in order to identify specific portions. Waterbody segments are identified by a segment ID made up of an underscore and two additional digits. Waterbodies are initially assigned a segment ID of _00. If additional segmentation is required, upstream segments receive a number higher in value (e.g., _10, _20, _30).

"OK 311500 03 0010**_00**"

Not all waterbodies have been assigned an identification number, primarily due to limited resources and need. As more waterbodies are assessed, the WBID system is designed to incorporate a unique identifier for these waterbodies. Only waterbodies included in the USGS National Hydrography Dataset (NHD) will be considered for inclusion in the Oklahoma WBID System.

CONTROL OF RESIDUAL WASTE

PERMIT REQUIREMENTS

In accordance with Section 208(b)(2)(J) of the Act, Federal Regulations 40 CFR 130.6.(c)(4)(iii)(A) requires the identification of a process to control the disposition of all residual waste in the area which could affect water quality. Under 40 CFR Part 503, the use or disposal of sewage sludge including domestic/municipal sludge and domestic septage are regulated. Likewise, 40 CFR Part 257 regulates grit and screenings removed from the treatment of domestic sewage, drinking water treatment sludge, commercial and industrial septage, industrial/sewage sludges generated at an industrial facility during the treatment of industrial wastewater or a combination of industrial and domestic wastewater. The NPDES regulations on sludge management allow the permit writer the discretion to permit any entity/facility that has the potential for adverse effects on public health and environment. These facilities either generate sewage sludge or otherwise effectively control the quality of sewage sludge or the manner in which it is disposed. Thus, NPDES permit will not only be issued to wastewater discharging facilities, but also to sludge producing and/or disposal facilities. In case of a discharging facility, sludge requirements are included in the joint Oklahoma DEQ/EPA NPDES permit. The permit language on sludge requirements reflects the most updated EPA's version on sludge pertaining to 40 CFR Parts 257, 258 and 503.Under the Oklahoma Pollutant Discharge Elimination System (OPDES) standards (State Rules; OAC 252:606-8), all facilities which generate sludge shall comply with the requirements of the State Solid Waste Management Act and rules of DEQ promulgated thereunder (State Rules; OAC 252:515,Management of Solid Waste), and any requirement of the discharge permit regarding sludge.

SLUDGE MANAGEMENT PLANS

The OPDES Regulations also require facilities generating sludge to comply with sludge management plan. The plan shall be approved by DEQ prior to any disposal of sludge, and will be appended to the facility's discharge permit or other Department-issued permit.

The Plan shall include at least the following information:

- The source and type of sludge,
- Sludge treatment process,
- Amount of sludge generated,
- Sludge characteristics: chemical, physical and biological characteristics,
- Storage, transportation to the disposal site and disposal techniques

- Disposal site location and site characteristics (surface area, soil type, water table, certain
- Chemical characteristics of the soil, if land applied....),
- Life expectancy of the disposal site and closure plan,
- Sludge testing, sampling and report requirements
- Administration of the sludge treatment and disposal program.

PERMIT ISSUANCE PRIORITIES

The following priorities will be observed in allocating resources for issuance/reissuance/modification of NPDES permits.

1. Issuance or re-issuance of permits for major dischargers
2. Issuance or reissuance or modification of permits for minor dischargers in order to address toxicity or toxic pollutants
3. Issuance of permits for minor industrial dischargers with expired "First Round" NPDES permits
4. Issuance or reissuance of permits for all other minor dischargers
5. Issuance of stormwater permits
6. Issuance of other general permits

With the exception of Item 3, these activities are anticipated to occur as they come up. However, Item 3, minor industrial dischargers with expired "First Round" NPDES permits, involves a significant number of facilities. These will be prioritized using a watershed approach. The State's existing planning segments will be utilized for watershed boundaries. Individual watersheds will be prioritized by considering such factors as the 303(d) list, the 305(b) water quality assessment, special designations (such as ORW or HQW) in the WQS, and the number of dischargers in the watershed.

These priorities may be modified in some cases for businesses that are considering locating in Oklahoma and bringing new jobs to the State. As the DEQ Customer Assistance Program begins to work with a new business, they will identify those permits that need to be placed at the head of the permit processing line and coordinate directly with the Water Quality Division to arrange for this level of treatment. In order to minimize processing time for certain high profile permit applications, they may be assigned a priority status so that every step of the process can be accomplished in the absolute minimum time. When it appears that a high profile permit may require such expedited treatment, the Customer Assistance Program will seek approval from the Office of the Executive Director to arrange for this level of priority.

CHAPTER 4

PLANNING AND INTERGOVERNMENTAL COOPERATION

INTRODUCTION

This Chapter describes the planning process and the process for assuring adequate authority for intergovernmental cooperation in the implementation of Oklahoma's Water Quality Management Programs. The first part is a historical summary regarding the development of planning documents and the participation of the various State agencies, which have authority related to water quality. The second part is a general description of the public participation process and its opportunities. The next part deals with the planning process and procedures for making major, minor, and comprehensive updates to the State's Water Quality Management (WQM) Plan. The last section describes, in detail, the intergovernmental coordination with regard to local, regional, State and federal entities.

HISTORICAL SUMMARY

Section 208 of the Federal Water Pollution Control Act of 1972 (as amended) mandates that the states develop a process and procedure for managing and planning their waters. The outcome of this process was the development of a planning document called the "Water Quality Management Plan" (WQM Plan or the 208 Plan). The 208 Plan describes the process used in identifying point and nonpoint sources of pollution and the implementation of programs and procedures for the abatement or prevention of pollution to waters of the State.

For the purpose of water quality management planning, the State was divided into seven major planning basins for each river system. This was mainly due to the State's great diversity in climate, topography, geology, and population distribution. The seven major basins are further subdivided into fifty-nine subbasins, or stream segments, allowing for more precise water quality assessment, planning and management. The boundary of each segment was based on either hydrological features such as flow patterns, dams, reservoirs or gauging stations, political constraints such as county boundaries, or in some cases it was due to the convenience of a bridge or road crossing. These 208 segments are utilized as the basic units in establishing the Oklahoma WQS.

The initial State WQM Plan consisted of seven separate Basin Plans, which were completed and approved by EPA in 1975. These plans were completed under Section 303(e) of the Clean Water Act as part of the continuing planning process. This planning process constituted Phase I in the development of basin-wide WQM Plans. Phase I planning dealt largely with developing wasteload allocations for point sources. Neither nonpoint source pollution, nor the required management and implementation steps, were included in the Phase I plans.

Phase II of the planning process was completed under Section 208 of the Clean Water Act. Phase II WQM Plans for each basin were completed and approved by EPA in 1979. The purpose of Phase II planning was to utilize, update, and expand the water quality planning information gained in the Phase I planning and to coordinate and integrate area wide 208 planning into the overall Statewide 208 Plan. One goal of water quality management planning was to identify all sources of pollution. Pollution information derived in the original seven basin plans was reviewed and incorporated into the more comprehensive 208 Plan.

Since the initial WQM Plans were completed, planning efforts have focused on identifying water quality pollution problems in the State and developing implementable plans for control, abatement, or prevention of pollution. In 1981, the WQM Plan Updates for each of the seven basins were completed by the State. These updates were addenda to the WQM Plan completed in 1979 and served to expand, with more detail, Chapters II and III of the initial plan (Basin Description and Point Sources Analysis).

In FY 1981, the State developed a single document format, which could be easily and less expensively updated instead of the previous seven separate Basin Plans. Statewide information was included in the single plan with more specific information for each basin being discussed as appropriate. The 1981 updates included both Industrial and Municipal Inventories as appendices to the plan.

In FY 81, funding under Section 208 of the Clean Water Act ended. Since that time, the State's efforts in water quality management planning have been greatly curtailed. Other funding sources that have been used for water quality management planning effort have included sections 205(j), 604(b)(3), and 106. To date, only funds from sections 604(b)(3) and 106 are being used. The utilization of other funding sources, federal, State, and local, for water quality management planning will continue to be explored.

In FY 1985, the WQM Plan was updated again to reflect advancements in monitoring, quality, assessment, and pollution identification in various stream segments.

PUBLIC PARTICIPATION IN THE CONTINUING PLANNING PROCESS

GENERAL DESCRIPTION

Public participation opportunities in the planning processes are offered primarily through four procedures, generally described as follows:

1. Revision and update of the water quality management plans,
2. Permitting procedures for point source discharge permits and 401 water quality certifications,
3. Rulemaking activities of DEQ and other state and federal agencies, and
4. Public forums designed to allow public comment and input on issues of public concern.

The specific procedures for allowing public participation are described as follows:

REVISION AND UPDATE OF THE WATER QUALITY MANAGEMENT PLANS

Opportunity for public participation is provided through and in compliance with 40 CFR Part 25 and this Chapter. One of these opportunities include the issuance of 45 day notices for public comment and request for public formal meeting issued to interested persons, news media, and other special interest groups. These opportunities are further described in detail below:

1. Public Notice to amend the WQM Plan with a 45-day comment period required:
    a. Contents as required by 40 CFR 25.4: timetable for decision, issues, tentative determinations made by the agency, cite applicable law and rules, location where relevant documents can be reviewed or obtained, identification of public participation opportunities such as meeting (if significant interest), name of contact person for additional information, an address to mail in comments, the type of revision, facility, location, limits/loadings, etc.
    b. Distribute public notices to the following:
        (1) Mailing list (kept current as needed),
        (2) State/local government agencies including Oklahoma Department of Wildlife Conservation, Oklahoma Department of Tourism and Recreation, substate planning agencies (COGs), and DEQ local offices,
        (3) Minimum of two newspapers in area affected - to be published at their discretion only (DEQ will not be responsible for cost of publication of any Public Notice).
2. DEQ determines if there is "significant public interest" or if a public meeting would be useful:
    a. If answer is no, then prepare a Response to Comments for any comments received. Forward the Response with a letter for Water Quality Division (WQD) Director's signature to send to EPA requesting final approval of WQM Plan amendments.
    b. If answer is yes, go to #3.

3. DEQ's Watershed Planning and Stormwater Permitting Section makes arrangements for the meeting including date, time, and location;
    a. Must be not less than 45 days after notice is given to hold the meeting;
    b. Preferably in the evening and in the area affected;
4. Public meeting notice should contain the following:
    a. A 45-day public notice and comment period is required;
    b. The public meeting notice must comply with 40 CFR 25.5: identify the matters to be discussed at the formal public meeting, include a discussion of the agency's tentative determination on major issues, procedures for obtaining further information, notice of meeting not less than 45 days after the notice given. Reports, information, data must be available to the public at least 30 days before the date of the meeting;
    c. Location, time, (preferably in the evening) and place of meeting (in the area affected, if possible);
    d. The Public meeting notice should be distributed to:
        (1) Mailing list (kept current as needed),
        (2) State/local government agencies including Oklahoma Department of Wildlife Conservation, Oklahoma Department of Tourism and Recreation, substate planning agencies (COGs), DEQ local offices, and to all persons submitting comments.
        (3) All members of the public who submitted comments in response to the first public notice.
        (4) Everybody who received the original public notice.
5. Format of a public meeting:
    a. First part of the meeting is to be an informal presentation, question and answer period, and discussion of the issues;
    b. Second part is to be a formal meeting during which public comments are received. This part of the meeting is recorded;
    c. Written comments and oral statements will be included in the official record;
    d. Must comply with 40 CFR 25.5(e) and (f);
    e. The record may be kept open for not more than five (5) days following the meeting to allow for additional comments.
    f. A response to comments is prepared in compliance with 40 CFR 25.8 which must be available to the public.
6. Make any necessary modifications in response to comments received during the public participation process.
7. Draft a letter requesting final approval of WQM Plan amendments. The letter should be signed by the WQD Director's signature, or if unavailable, the WQD Assistant Director's signature. Send the letter to EPA with description of the public participation process and response to public comments attached. See Figure 16.

PERMITTING PROCEDURES FOR POINT SOURCE DISCHARGE PERMITS

Public notice, comment, opportunity for public meeting, and (after authorization of DEQ's proposed NPDES program) opportunity to request an administrative permit hearing are provided under the DEQ discharge permit program as specified in OAC 252:606. The rules contained in OAC 252:606 incorporate by reference applicable regulations of EPA regarding public participation in the discharge permit program, except that the process for administrative hearings will be slightly different. OAC 252:606 procedures will also apply to sewage sludge permits encompassed by the EPA program.

401 WATER QUALITY CERTIFICATION

Opportunities for public notice regarding 401 water quality certifications are described in applicable federal regulations of the federal permitting authority and in the DEQ's rules contained in OAC 252:611.

RULEMAKING ACTIVITIES OF DEQ AND OTHER STATE AND FEDERAL AGENCIES

The APA, 75 OS 1991 §251 et seq., requires public participation in rulemaking activities for all permanent rules through publication of notice in *The Oklahoma Register*, public comment for 20 days, rulemaking hearing to accept verbal comments, and publication of final rules. The APA's definition of "rule" is quite broad in scope, so that the State will be required to promulgate rules even in situations where federal agencies might not be required to do so. All requirements relating to water quality management plans, pollution abatement, wastewater treatment and disposition, permitting, approval of remediation plans, enforcement of Oklahoma WQS, administrative proceedings, natural resource damage assessments, and similar requirements shall be contained in appropriate Chapters of the DEQ's rules. These requirements are for the most part now contained in OAC 252 Chapters 600 through 690.

PUBLIC FORUMS FOR PUBLIC COMMENT ON ISSUES OF PUBLIC CONCERN

Both the Water Quality Management Advisory Council and the Environmental Quality Board are authorized by law to conduct public forums around the State of Oklahoma. The Environmental Quality Code provides this authority, implemented by the Board in quarterly meetings at different locations in the State. It is anticipated that water quality issues such as those involved in the CPP and WQM Plan will be addressed at such public forums.

TMDLS AND THE PUBLIC PARTICIPATION PROCESS

Opportunity for public participation during the development of TMDLs and WLAs is provided through, and in compliance with, 40 CFR Part 25 and this chapter. DEQ encourages public involvement and awareness by issuing various notices using available media outlets and current mailing lists. The specific procedures for soliciting public participation during the development of TMDLs for watersheds and WLAs for wastewater treatment facilities are described below.

WATERSHED TMDLS

Watershed TMDLs address one or more pollutants from all sources in an identified watershed. A variety of flow conditions are simulated and non-point source contributions may be significant. After EPA final approval, the TMDLs are integrated into the State's Water Quality Management Plan (WQMP) following the appropriate procedures. The public participation procedures for adoption of the TMDL and for incorporating the TMDL into the Water Quality Management Plan may be undertaken concurrently. A sample of the TMDL factsheet to be used for the WQMP is provided in Appendix C.

Prior to the beginning of the public participation phase, DEQ will forward the draft TMDL report to EPA Region 6 for preliminary review. After EPA finds the report acceptable, DEQ will issue a public notice that summarizes the findings of the TMDL report. The public

notice will be distributed using a current mailing list, which includes State and local government agencies, environmental groups, stakeholders, citizen groups, etc., and at least two newspapers in the affected area. The public notice and supporting documents are also to be posted on DEQ's website. Public comments are accepted for a 45-day period, beginning on the issue date. If no public meeting is held, a response to any written comments is prepared. The TMDL report is finalized and submitted to EPA Region 6 for final approval.

If a public meeting is requested and DEQ determines that a significant degree of public interest exists, a public meeting is scheduled. A public meeting notice that identifies the matters to be discussed, DEQ's tentative determination on major issues, procedures for obtaining additional information, and the meeting time and date is issued at least 45-days prior to the meeting. Any reports, data, or other information is also available for public review at least 30-days prior to the meeting. The public meeting notice is to be mailed to all who received the first notice, and to any person or group who submitted comments on the TMDL report.

In some cases, DEQ may decide to hold a public meeting without waiting for one to be requested. In these circumstances, the initial public notice may be combined with the public meeting notice. This public notice must include the date, time, and place of the meeting and must be scheduled at least 30-days after the distribution of the public notice.

The public meeting is conducted in two parts. The first portion of the meeting is informal and consists of a presentation of the scheduled topic, a question and answer period, and a discussion period. The second part of the meeting is formal and public comments are recorded. Following adjournment, the formal record remains open for no more than five days to allow for additional comments. A response to comments is developed along with any necessary modifications to the TMDL report. DEQ finalizes the TMDL report and submits it to EPA for final approval.

POINT SOURCE TMDLS

Point source TMDLs evaluate the impact of one or a limited number of point source discharges. The analysis simulates low flow, high temperature conditions when non-point sources are not a significant factor. Prior to the beginning of the public participation phase for a WLA, the requesting facility is allowed a 30-day review period. DEQ then forwards the WLA to EPA Region 6 for technical approval. Upon receipt of technical approval, DEQ issues a public notice that summarizes the facility's proposed WLA changes. The notice is distributed using a current mailing list, which includes State and local government agencies, environmental groups, stakeholders, citizen groups, etc., and at least two newspapers in the affected area. Public comments are accepted for a 45-day period, beginning on the issue date.

If no public meeting is held, a response to any comments is prepared, and the WLA is forwarded to EPA for final approval and inclusion in the State's Water Quality Management Plan.

If a public meeting is requested and DEQ determines that a significant degree of public interest exists, comments are received, a public meeting is scheduled. DEQ's Watershed Planning and Stormwater Permitting Section makes the necessary meeting arrangements. A public meeting notice is distributed at least 45-days prior to the meeting. This notice identifies the matters to be discussed; DEQ's tentative determination on major issues; procedures for obtaining additional information; and meeting time, date, and location. Any reports, data, or other information is also available for public review at least 30-days prior to the meeting. The public meeting notice is mailed to everybody who received the first public notice and to any person or group who submitted comments on the WLA. If DEQ decides to hold a public meeting without waiting for one to be requested, the initial public notice may be combined with the public meeting notice as long as it includes the date, time, and place of the meeting which must be scheduled at least 45 days after the distribution of the public notice.

The public meeting is conducted in two parts. The first portion of the meeting is informal and consists of a presentation of the scheduled topic, a question and answer period, and a discussion period. The second part of the meeting is formal and public comments are recorded. Following adjournment, the formal record remains open for no more than five-days to allow for additional comments. A response to comments is prepared along with any necessary WLA modifications. DEQ sends the response to comments to all who responded to the WLA. DEQ forwards the WLA, along with the responses to any comments received, to EPA Region 6 for final approval.

UPDATING AND MAINTAINING THE WATER QUALITY MANAGEMENT PLAN

AUTHORITIES OF STATE AGENCIES AND OTHERS

Prior to enactment of the Environmental Quality Code, 27A OS Supp. 1993, §2-1-101 et seq., seven State agencies (the OCC, OSDH, ODWC, ODAFF, the Conservation Commission, the Department of Mines and OWRB) had some statutory authority over water quality in Oklahoma and all were involved to some extent in water quality management planning and in developing the State WQM Plan. Designated Area wide Agencies were also involved with water quality management planning by development of area plans and preparation of planning reports for their regions.

This information was provided to the State (the Pollution Control Coordinating Board and the Department of Pollution Control) for review and incorporation into the Statewide WQM Plan.

Since the enactment of the Environmental Quality Code, effective July 1, 1993, primary authority over water quality planning resides with DEQ as follows:

1. DEQ has statutory authority under the Environmental Quality Code, 27A OS Supp., 1993, §2-6-103(6), to "...Establish, implement and enforce the Water Quality Management Plan, the continuing planning process documents, and wasteload allocations..."
2. The Environmental Quality Board has the authority under 27A OS Supp., 1993, §2-6-103 to adopt by reference Oklahoma Water Quality Standards and "... to promulgate other rules to protect, maintain and improve the best uses of waters of this State in the interest of the public under such conditions as may be necessary or appropriate for the prevention, control and abatement of pollution."
3. The Executive Director, or his appointed elective, has the authority to issue point source discharge permits for all municipal and industrial facilities regulated by DEQ, sources and activities, coextensive authority over non-point source pollution, the authority on behalf of the State of Oklahoma to issue water quality certifications for all activities subject to Section 401 of the Clean Water Act, and authority to exercise all incidental powers necessary to carry out the duties of DEQ relating to the CPP, the WQM Plan, and other water quality matters (27A OS Supp., 1993, §2-1-103(C)). The powers of the Executive Director include the authority to enter into any appropriate or necessary intergovernmental agreements, contracts or memoranda of understanding in order to carry out the duties of DEQ relating to the CPP and WQM Plan.

REQUIRED CONTENTS OF PLANS

Sections 205(j), 208 and 303 of the Clean Water Act and 40 CFR Part 130 specify water quality planning requirements. Key provisions, which set forth required elements of the WQM Plans are included here for reference.

Section 208 of the Clean Water Act requires each state to prepare, and update as needed, a WQM Plan which contains the following:

1. The identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of the area over a twenty-year period, including an analysis of alternative waste treatment systems, including any requirements for the acquisition of land for treatment purposes; the necessary waste water collection and urban stormwater runoff systems; and a program to provide the necessary financial arrangements for the development of such treatment works, and an identification of open space and recreation opportunities that can be expected to result from improved water quality, including consideration of potential use of lands associated with treatment works and increased access to water-based recreation;
2. The establishment of construction priorities for such treatment works and time schedules for the initiation and completion of all treatment works.
3. The establishment of a regulatory program to
    a. Implement the waste treatment management requirements of section 201(c),
    b. Regulate the location, modification, and construction of any facilities within such area which may result in any discharge in such area, and,
    c. Assure that any industrial or commercial waste discharged into any treatment works in such area meet applicable pretreatment requirements,
4. The identification of those agencies necessary to construct, operate, and maintain all facilities required by the plan and otherwise to carry out the plan;
5. The identification of the measures necessary to carry out the plan including financing, period of time, costs, and the economic, social, and environmental impacts;
6. A process to
    a. Identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution, including return flows from irrigated areas, and from land used for livestock and crop production, and;
    b. Set forth procedures and methods (including land use requirements) to control to the extent feasible such sources;
7. A process to
    a. Identify, if appropriate, mine-related sources of pollution including new, current, and abandoned surface and underground mine runoff, and;
    b. Set forth procedures and methods (including land use requirements) to control to the extent feasible such sources;
8. A process to
    a. Identify construction activity related sources of pollution, and;
    b. Set forth procedures and methods (including land use requirements) to control to the extent feasible such sources.
9. A process to control the disposition of all residual waste generated in such area which should affect water quality; and
10. A process to control the disposal of pollutants on land or in subsurface excavations within such area to protect ground and surface water quality.

DEQ in revising the WQM Plans will ensure that the requirements of 40 CFR Part 130, adopted by reference in DEQ rules at OAC 252:611, are met. The plans will be updated and revised to include all required elements set forth in 40 CFR Section 130.6(c), including the following:

- Total Maximum Daily Loads (TMDLs);
- Effluent limitations including water quality based limitations and schedules of compliance in accordance with CWA Section 303(e)(3)(A) and 40 CFR §130.5;
- Municipal and industrial waste treatment, including identification of anticipated treatment works, financial programs, construction priorities and schedules;
- Nonpoint source management and control, including description of programs and BMPs;

- Description of agencies, authorities and intergovernmental coordination;
- Implementation measures, including financing, time schedule and impacts of plans;
- Identification of dredge and fill regulatory programs;
- Basin plans; and
- Description of groundwater pollution programs.

FORMAT OF PLANS AND INFORMATION SOURCES

The format of the statewide WQM Plan should be structured to facilitate utilization of its contents and it should contain adequate information to describe the water quality, pollution problems and management activities in each basin. The goal should be to identify all municipal, industrial, nonindustrial, agricultural, oil and gas related, and other dischargers as well as potential sources of nonpoint source pollution, prioritize water quality problems, consider alternative solutions and recommend control measures for implementing solutions.

There are currently three "designated area" WQM Plans affecting Oklahoma. These are the Association of Central Oklahoma Governments' (ACOG) plan of the greater Oklahoma City area (Oklahoma, Cleveland, Canadian and Logan Counties); the Indian Nations Council of Governments' (INCOG) plan for the greater Tulsa area (all of Tulsa, Creek and Osage Counties, as well as parts of Rogers and Wagoner Counties); and the Arkhoma Regional Planning Commission's (ARKHOMA) plan for the area surrounding Fort Smith, Arkansas (including all of Sequoyah and LeFlore Counties in Oklahoma and Crawford and Sebastian Counties in Arkansas). The area wide plans go through a certification process similar to the statewide plan, with the exception that the plans must be formally adopted by the governing board of the designated agency.

Historically, information, which was utilized in updating/developing the overall statewide plan resulted from specific studies conducted by State agencies under the 208 Plan to identify pollution problems, develop implementation strategies, abatement and prevention programs, and to develop educational programs. Additional information came from 208 studies that were carried out by Designated Area wide Agencies and the associated WQM Plans developed for their respective areas. It is anticipated that these information sources will continue to be utilized in future updates.

SCHEDULES AND PROCEDURES FOR REVISION

State and/or area wide agency WQM Plans "...shall be updated as needed to reflect changing water quality conditions, results of implementation actions, new requirements or to remove conditions in prior conditional or partial plan approvals", as required by 40 CFR 130.6(e) of EPA regulations and OAC 252:611 of DEQ rules. OAC 252:606 incorporates by reference applicable EPA regulations relating to revisions of the WQM Plan for point source discharges contained in 40 CFR Parts 122 and 124. Updates and revisions shall comply with the public participation requirements of 40 CFR Part 25.

The State will distinguish between "comprehensive updates" conducted yearly or at larger intervals as needed, and more frequent updates ("as-needed updates"), which generally relate to particular stream segments and/or discharges. As-needed updates are subject to slightly different procedures according to their classification as "major" or "minor" modifications of the Plan(s). The procedures for updates are discussed in the following sections.

COMPREHENSIVE UPDATES

The process by which the Statewide WQM Plan will be comprehensively updated is as follows:

a. DEQ and area wide agencies prepare planning outputs, which serve as technical support for the plan.

b. DEQ synthesizes the information and compiles recommendations into the WQM Plan document.

c. All significant outputs (or their executive summaries) and draft plans are submitted to appropriate State agencies, area wide agencies and EPA for review and comment.

d. The draft updates are submitted for review and comment to the local environmental committees and other local decision makers, and through the area wide programs.

e. The proposed revisions are subject to public participation procedures consistent with 40 CFR 25, as detailed in this Chapter. For comprehensive updates, a minimum public comment period of sixty days shall be provided and at least two public meetings shall be held in different locations across the State (usually in Tulsa and in Oklahoma City).

f. A responsiveness summary is prepared in accordance with 40 CFR Part 25 and is made available to the public for review.

g. Changes and revisions are made by DEQ in response to comments received and a final output or revised plan update is developed. The proposed update is provided to the Division Director of the Water Quality Division (WQD) of DEQ for certification.

h. The approved plan or output is forwarded to the Regional Administrator of EPA with the letter of certification signed by the WQD Director of DEQ.

i. EPA then approves or disapproves the document and notifies the WQD Director of DEQ.

CHANGES, ADDITIONS, OR DELETIONS TO THE WATER QUALITY MANAGEMENT PLAN UPDATE ON AN "AS-NEEDED BASIS"

Procedures have been established to allow for changes in "Appendix A" (Industrial facility factsheet), "Appendix B" (Municipal facility factsheet), "Appendix C" (TMDL factsheets), or other appropriate portions of the last certified fiscal year plan update on an "as-needed" basis. These procedures are designed to meet the requirements of applicable State and federal law and regulations relating to point source discharges, including 40 CFR 122.44(d), 122.4, 130.6(e) and 130.7, and OAC 252:611 Subchapter 1 (General Water Quality - Planning and Wasteload Allocations). More frequent updates allow resolution of Section 201, Section 208, and other issues on a timely basis.

Criteria have been established which distinguish between major or minor modifications to the last updated WQM Plan. The difference between minor and major modifications establishes the level of public participation and review each will receive; minor modifications may be postponed where allowed until the next comprehensive update of the Plan.

MINOR MODIFICATIONS

Minor Modifications may be made when changes to the Plan will not result in a significantly different plan recommendation and any water quality impacts of the change are negligible. Minor modifications will be subject to administrative approval by the WQD Director of DEQ and submitted to EPA as needed, but without the public notice and comment period prior to this first submittal. All minor modifications will later be subject to public review and comment at the next comprehensive update. EPA will notify the Water Quality Division Director of their decision on each minor modification within 45 days of receipt. Proposed modifications, which are not determined to be minor will require formal public notice and public comment period prior to recommendation by the Water Quality Division Director.

The following modifications may be considered minor.

(1) Make corrections to the facility name, legal description for the facility, NPDES number, legal description for the Point of Discharge for the facility, etc.

(2) Corrections to the facility's current treatment process, assuming the change does not require a modification to the WLA.

(3) Increase in Effluent Flow

(a) The increase in design flow for municipal facilities does not exceed the smaller of the following two: a maximum increase in flow of 30% of the approved WQM Plan occurring since its last major update, or any increase in flow which is not more than 0.5 MGD.

or

The increase in the present average daily flow for industrial facilities, does not exceed the smaller of the following two: a maximum increase in flow of 30% of the approved WQM Plan occurring since its last major update, or any increase in flow which is not more than 0.5 MGD.

(b) Water quality modeling shows that the increased flow will have a negligible impact on the receiving water, will not result in a change of existing effluent limits, and that applicable water quality standards will be met. The results of the water quality model will be submitted to EPA in advance for initial review and approval.

(c) The design flow for municipal facilities or present average daily flow for industrial facilities, has not been previously increased under these criteria.

(d) The receiving water is not designated "ORW", "HQW", or "SWS" in the WQS or considered environmentally sensitive for other reasons.

(4) Corrections to the receiving stream for the facility without affecting the WLA for the facility.

(5) Correction in 7Q2 of receiving stream without affecting the WLA for the facility.

(6) Change or correction the in Designated Management Agency (DMA) and its Status for Municipal Facilities. The status of DMA may be changed to "approved" if the necessary acceptance form has been signed, filed, and approved by DEQ provided the DMA has been previously designated in the WQM Plan.

(7) Change in Facility Ownership for Industrial Facilities. A change in ownership or operational control may be reflected in the WQM Plan if a request for permit modification has been approved by the regulating State agency.

(8) Increase in Population Projections (Municipal Facilities)

(a) Projections to the end of a 20-year planning period which extends beyond the design year of the WQM Plan may be added to the WQM Plan provided they do not exceed the projection most recently published by the Oklahoma Department of Commerce (ODOC) for that year.

(b) Present or projected population may be modified so as to exceed the ODOC figures only if:

i) The service area of the facility is larger than the community boundary on which the ODOC figure is based; and/or

ii) Industrial flows to the facility are included as a population equivalent. The population equivalent will be calculated based on one person for each 100 gallons per day of industrial flow.

These changes must be adequately justified in a facility plan or an engineering report.

(c) Population projections developed and adopted by a designated area wide planning agency may be incorporated in the State plan. These projections will be reviewed on a case-by-case basis and may exceed the ODOC figures if adequate justification is provided.

PROCEDURES FOR MINOR UPDATES

The following procedures will apply to updates that qualify as minor changes to the WQM Plan:

(a) The Watershed Planning Section of DEQ's Water Quality Division (WQD) receives the request from the municipal or industrial discharger to modify the WQM Plan or otherwise determines if such a change is necessary or appropriate.

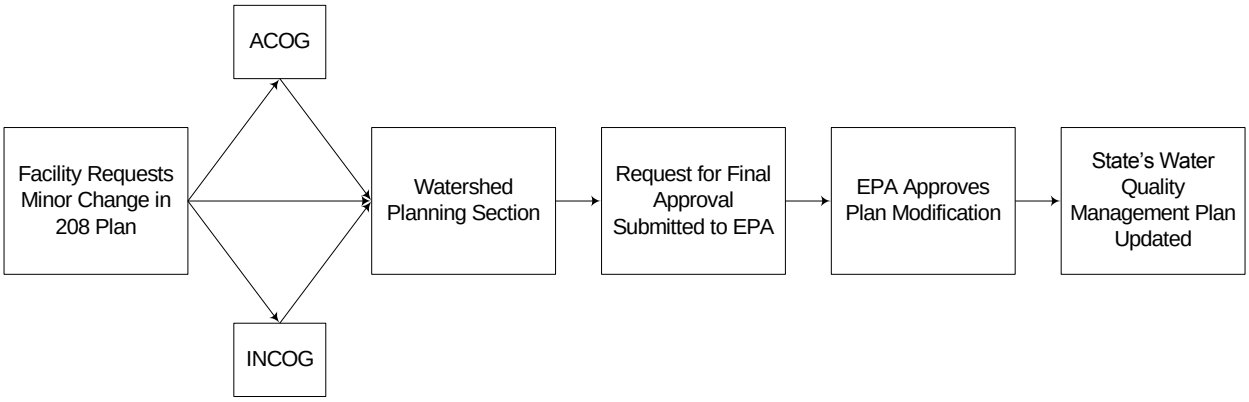
(b) The Watershed Planning Section prepares a modified 208 factsheet.

(c) The Watershed Planning Section forwards the proposed 208 Plan modification to the WQD Director and then to EPA for their approval, if needed.

(d) When EPA's approval is received, the Watershed Planning Section will update all appropriate records and database of the modification; the Watershed Planning Section will update, as appropriate, the Appendices of the WQM Plan.

(e) The minor changes will be subject to public comment at the next comprehensive update of the WQM Plan.

FIGURE 15: FLOW CHART OF MINOR CHANGES TO THE WQM PLAN



PUBLIC PARTICIPATION AND STATE REVIEW OF "AS-NEEDED" MAJOR REVISIONS OF THE WATER QUALITY MANAGEMENT PLAN

Changes, which do not qualify under the described criteria as "minor changes," will follow the procedures described in the following paragraphs. DEQ has incorporated by reference applicable provisions of 40 CFR Part 130 relating to the planning process in OAC 252:611. Applicable provisions of 40 CFR Part 25 describing adequate public participation shall be followed. DEQ's policy is to enhance and encourage public participation and education about matters of public interest.

PROCEDURES FOR MAJOR CHANGES

In order to provide public notification to the persons identified by federal regulations in 40 CFR Part 25, the public participation procedures detailed earlier in this Chapter will be followed. These procedures will conform to the requirements of 40 CFR Part 25.

In addition, the following administrative procedures shall apply to major as-needed updates of WQM Plans:

(1) Watershed Planning Section of DEQ receives a request from the municipal or industrial discharger to modify the WQM Plan or DEQ otherwise determines that such a change is appropriate or necessary.

(2) If WLA/TMDL modeling work is needed or required, the discharger may perform the work itself, contract with a consultant to perform the work, or

request DEQ to perform the work. If DEQ accepts the request, they will prepare an estimate of all cost for such work and submit a contract to conduct said work to a requesting entity or other responsible party. Upon execution of the contract and agreement to pay for costs, DEQ will perform the necessary modeling work and send the results to EPA for review and technical/preliminary approval. If the requesting entity or responsible party chooses to use an outside contractor to perform all necessary work, the work must be performed in a timely manner and submitted to DEQ for approval and transmittal to EPA Region 6 (EPA).

(3) Upon EPA's technical/preliminary approval of the WLA/TMDL, the requesting entity or other responsible party shall pay to DEQ within 30 days all costs and expenses of the modeling work, if it is performed by DEQ.

(4) When EPA's approval is received, the Watershed Planning Section will prepare a modified 208 factsheet, reflecting all necessary changes.

(5) Watershed Planning Section will prepare public notification documents for the Plan modification and send it out for public comment in accordance with the requirements of 40 CFR Part 25, applicable State law, and the procedures of this Chapter. Watershed Planning Section will be responsible for responding to comment(s) received from the public. Requests from the news media will be forwarded to the Public Information Officer. All questions or requests from law firms will be forwarded to a DEQ's Water Quality attorney in the Office of General Counsel. All other questions from the public will be addressed by the Watershed Planning Section.

(6) After the public comment period is over, DEQ will determine if there is significant interest for a public meeting. If not, the Watershed Planning Section will address any public comments received, make additional changes if necessary, then forward the WQMP revision request, which includes the proposed 208 Plan modification, to the WQD Director. Once the WQD Director approves of the modification and WQMP revision, it will be sent to EPA for their final approval.

(7) After the public comment period is over, and DEQ determines that there is significant public interest, then arrangements will be made for a public meeting. The procedures in 40 CFR Part 25 will be followed. A record of any public comments during the formal portion of the public meeting will be filed in DEQ's Central Records along with any written comments received. The public meeting will be held, if possible, within the town or locality being affected by the proposed modification to the WQM Plan. If it is impossible to hold the public meeting in the affected location, an alternative site as close as possible to the affected site will be utilized for the public meeting.

(8) After the public meeting, DEQ will address any comments received at the public meeting or in writing and make any additional changes, if necessary. The Response to Comments will be sent to all who submitted public comments. DEQ will forward the WQMP revision request, which includes the proposed 208 Plan modification, to the WQD Director. Once the WQD Director approves of the modification and WQMP revision, it will be sent to EPA for their final approval.

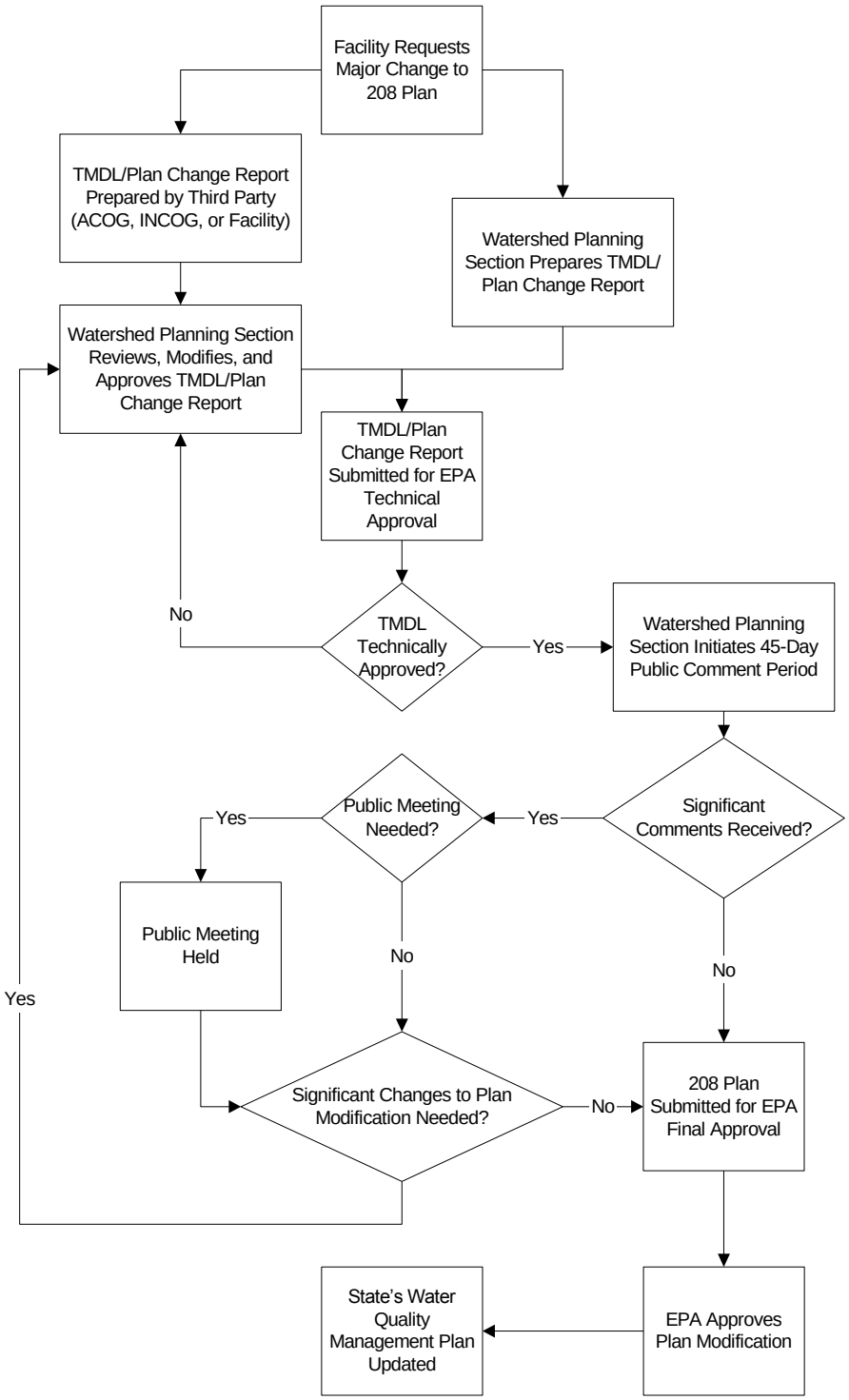
(9) When EPA's final approval is received, Watershed Planning Section will update their records and the applicable appendices of the WQM Plan. Sample 208s can be found in Appendices A (Industrial), B (Municipal), and E (TMDLs).

(10) The process for approval of a plan revision may be conducted simultaneously with the public participation process for a draft point source discharge permit.

(11) WLA/TMDL for non-dissolved-oxygen-demanding substances: To expedite the WQM planning and permitting process, EPA in a memorandum of understanding (MOU) of June 8, 1996, authorized DEQ to proceed with public notification of the plan change/update prior to EPA's

approval for WLAs/TMDLs for non-dissolved oxygen-demanding substances. For this type of change, EPA's approval as outlined above in steps (2), (4), (8), and (9) shall not be required. However, EPA shall be informed of the plan change/update during the public notification process (step 5). EPA may review and comment on the proposed changes(s) when necessary.

FIGURE 16: FLOW CHART OF MAJOR CHANGES TO THE WQM PLAN



DEQ/EPA 208 MOU MODIFICATIONS FOR INDUSTRIAL DISCHARGERS

EPA Region 6 and DEQ have developed a MOU that designates and changes some of the agency's roles in the process of updating the WQMP. This MOU will assist both agencies in providing more timely updates for permit issuance.

The WQMP had included guidelines for processing all the municipal discharging facilities but there were very few guidelines for the industrial dischargers to be incorporated into the WQMP. In the past, most of the industrial dischargers did not have their approved effluent limitations listed in the WQMP. A backlog had developed in an effort to incorporate all industrial dischargers. Executing this MOU established an expedited method to allow routine updates to the WQMP. This will avoid excessive delays in the permit issuance process.

The MOU designated both agencies' responsibilities as:

> DEQ will utilize the procedures set forth in the approved CPP. If the proposed effluent limitations for draft permits indicate a need to update or modify the WQMP, DEQ will prepare all necessary documentation and justifications including the public participation procedures for modifications to the WQMP. The public participation process for WQMP modifications may be undertaken concurrently with public participation activities for the facility's draft permit. DEQ will notify EPA of the proposed modifications to the WQMP when public participation commences.
>
> EPA reserved the right to review and formally approve or disapprove any individual proposed modification to the WQMP. EPA will notify DEQ of their intentions within 20 working days of receiving the request. Unless the WQMP modification is exempted from the MOU (see below), EPA will waive its review and formal approval of any WQMP modification and allow DEQ to approve the modification and incorporate it into the approved WQMP. The exemptions are as follows:
>
> - Effluent limitations for oxygen-demanding substances derived form a wasteload allocation model;
> - Effluent limitations derived from a TMDL that includes multiple waste sources;
> - Any modification for which EPA has exercised its right of review and approval.

The MOU does not restrict EPA's authority to review and modify all draft permits.

This MOU became effective June 1996.

UPDATES AND OTHER INFORMATION SUBMITTALS

Water quality limited stream segments requiring WLAs/LAs and TMDLs identified under 40 CFR 130.7(b) will be updated and submitted to EPA as required under 40 CFR 130.7(d). DEQ, in coordination with other appropriate federal, state, regional and local governmental agencies, will also update and revise required lists of waters and provide information required under 40 CFR §130.10, including:

(1) Waters which cannot reasonably be anticipated to attain or maintain water quality standards due to toxic pollutants or that water quality which will assure protection of public health, water supplies, and designated uses;

(2) Waters for which the applicable standard under section 303 of the cwa (numeric criteria for priority pollutants) is not expected to be achieved due to discharges of toxic pollutants; and

(3) Determination of point sources discharging toxic pollutants and amount of pollutants discharged for sources believed to be the cause of impairment of water quality for stream segments on the lists.

The lists required under §130.10(d) will be prepared and revised utilizing the information and data specified in 40 CFR 130.10(d)(6), including information relating to waters identified under Section 303(d) of the CWA as waters needing water quality-based controls, waters identified in the 305(b) Report, waters identified as priority waterbodies, and other available information identified in 40 CFR 130.10(d).

PROCEDURE FOR APPROVAL OF NEW DISCHARGERS

When planning for the development of an area, consideration must be given to providing an adequate collection and wastewater treatment system. Individual sewage treatment systems may be used as a means of wastewater disposal where soils are suitable, the wastewater is compatible, and lot size is sufficient. However, individual systems are not appropriate for industrial wastewater or when soils are not suitable. When individual systems are not workable, several alternatives must be considered. These include:

1. The collection and discharge of the wastes into an existing sewage system.
2. A total retention lagoon.
3. The treatment and use of the effluent for irrigation to avoid discharge.
4. A new discharging system.

The above alternatives are listed in the order of preference for types of treatment and disposal of wastewater.

The construction of a new discharging facility is the least desirable alternative and should be avoided if at all possible. Should a discharging facility be proposed, the Oklahoma Department of Environmental Quality will offer opportunity for public comment as part of the WQM Plan update process. If one is requested and DEQ determines there is a significant degree of public interest, a public meeting will be held prior to deciding whether the proposed discharge alternative can be approved. When a new discharge is proposed, a request including the following information must be submitted to DEQ for review, as part of a request to update the WQM Plan.

- The name, address, and phone number of the applicant.
- Acreage and legal description of the proposed development. Proposed use, such as a single or multiple family dwelling, commercial etc.
- The population equivalent and estimated flow to the proposed treatment facility. The location of the proposed treatment facility within the above described development. If the treatment facility will be located outside the described development, provide the legal description of the proposed site.
- The name of the stream that will receive the wastewater.
- Latitude and longitude of the proposed discharge point.
- A topographic map showing the location of the development, treatment facility, and discharge point.
- The proposed arrangements for operation and maintenance of the facility.
- An engineer's report that fully explains why each of the preferred alternatives mentioned above were not selected and provides data supporting the rejection of the preferred alternatives, including economic comparisons of the cost of each alternative.

These guidelines do not require submission of a formal application for a permit, nor do they require the submission of engineering plans and specifications. Preparation of these documents and commitments to purchase materials and equipment for the collection and treatment systems should be deferred until a determination is made regarding the approval of the proposed facility. This determination comes after the closure of the public comment period and conclusion of any public meetings (if applicable).

Since there can be no instream water quality information available for a proposed new discharge the wasteload allocation must be developed using an uncalibrated model. In order to ensure that water quality standards are maintained, the WQM Plan update for a new dicharge will include a requirement for verification monitoring after the discharge has been in place a sufficient time for the stream system to stabilize.

PROCESSES FOR INTERGOVERNMENTAL COOPERATION

REQUIREMENTS AND AUTHORITIES

A description of the process for assuring adequate authority for intergovernmental cooperation in the implementation of Oklahoma's Water Quality Management Program is a required component of the Continuing Planning Process pursuant to 40 CFR §130.5(b)(5) and Section 303(e)(3)(E). This Chapter will describe the process for intergovernmental coordination in these major areas:

- Coordinate activities with federal agencies as required under applicable federal laws,
- Ensure participation by all State agencies with jurisdiction over certain point and nonpoint sources of pollutants as set forth by 27A OS Supp., 1993, §1-3-101,
- Ensure adequate involvement of entities with functions related to area wide waste management plans under Section 208 and applicable basin plans under Section 201 of the Clean Water Act, and
- Coordinate planning efforts with other states, interstate compact commissions, and regional entities.

COORDINATE ACTIVITIES WITH FEDERAL AGENCIES AS REQUIRED UNDER APPLICABLE FEDERAL LAWS

Compliance with State water quality requirements by applicants for federal permits and coordination with the federal permitting authority is ensured in part through the 401 Water Quality Certification Program implemented by DEQ under OAC 252:611. Other coordination activities are carried out as required by applicable federal legislation, including but not limited to, the following:

- The Solid Waste Disposal Act, as amended (PL 91-512)
- The Safe Drinking Water Act (PL 99-339)
- The Clean Water Act, as amended (PL 91-604)
- The Coastal Zone Management Act (PL 92-583)
- The Watershed Protection and Flood Protection Act (PL 83-566)
- The Wild and Scenic Rivers Act (PL 90-542)
- The Rural Development Act of 1972 (PL 92-542)
- The Land and Water Conservation Fund Act, as amended (PL 88-578)
- The National Historic Preservation Act (PL 89-665)
- The Fish Restoration Act (PL 81-081) and the Federal Aid in Wildlife Restoration Act (PL 75-415)
- The Endangered Species Act (PL 93-205)
- Wastewater Management Urban Studies Programs administered by the U.S. Army Corps of Engineers (PL 685, 1938, PL 429, 1913)
- Transportation Planning administered by the Department of Transportation (PL 87-866, PL 93-366, PL 93-503)
- The Housing and Community Development Act of 1974 (PL 93-383)
- The Resource Conservation and Recovery Act of 1976 (PL 94-580)
- The Comprehensive Environmental Response, Compensation, and Liability Act (popularly known as "Superfund") of 1980 (PL 96-510)

- The Clean Water Act of 1977 (PL 97-117, PL 92-500, PL 95-217)
- The Fish and Wildlife Coordination Act
- National Environmental Policy Act and other Federally-assisted planning and management programs being carried on in Oklahoma.

Additionally, Oklahoma will coordinate with specific State and Federal water quality and natural resource agencies such as the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, U.S. Forest Service, and others.

ENSURE PARTICIPATION BY ALL STATE AGENCIES WITH JURISDICTION OVER CERTAIN POINT AND NONPOINT SOURCES OF POLLUTANTS AS SET FORTH BY 27A OS SUPP., 1993, § 1-3-101

GENERAL

The respective jurisdictions of Oklahoma State environmental agencies over nonpoint and point sources discharges of pollutants to waters of the State are clearly defined in 27A OS Supp. 1993, §1-3-101. "Waters of the State" is defined to include both surface waters and ground water, and in all cases includes "waters of the United States which are contained within the boundaries of, flow through or border upon this State or any portion thereof". 27A OS Supp., 1993, §2-6-101(16).

JURISDICTION AND AUTHORITIES

POINT SOURCE DISCHARGERS

DEQ has authority pursuant to 27A OS Supp., 1993, §1-3-103(B) over all point source discharges of pollutants and storm water to waters of the State which originate from municipal, industrial, commercial, mining, transportation and utilities, construction, trade, real estate and finance, services, public administration, manufacturing, and other sources, facilities and activities, except those under the jurisdiction of the Corporation Commission and ODAFF as specified in Sections 1-3-101 (D) and (E). Those under the jurisdiction of the Corporation Commission and ODAFF, to the extent a permit is required under the NPDES program, are by State law required to obtain a permit only from EPA and these NPDES permits will be subject to the 401 Certification authority of DEQ.

NONPOINT SOURCES

DEQ has authority under Section 1-3-101(B)(2) over all nonpoint source discharges of pollutants, except as provided in Subsection (D) [ODAFF] Subsection (E) [Corporation Commission], and Subsection (F) [Conservation Commission].

OTHER STATUTORY AUTHORITY

DEQ has additional, unqualified, authority under Section 1-3-101(B) of the Code for "surface and groundwater quality and protection and water quality certifications", "public and private water supplies", "freshwater wellhead protection", and "environmental regulation of any entity or activity, and the prevention, control and abatement of any pollution, not subject to the specific statutory authority of another State environmental agency."

RULES

DEQ has codified rules for point source discharges in OAC 252:606 and rules relating to nonpoint source, groundwater quality, general water quality, and the CPP in OAC 252:611. OAC 252:611 incorporates 40 CFR Part 130 by reference.

METHODS OF COORDINATION

DISCHARGERS

DEQ will ensure coordination with regard to sources, activities and facilities, which have point source discharges of pollutants requiring an NPDES permit from EPA in

part through its 401 Water Quality Certification program. Rules relating to certifications (OAC 252:611) provide that the federal agency, EPA, may provide public notice and both the rules and Section 401 of the CWA allow DEQ to take measures to provide public notice on applications for 401 certifications. DEQ and EPA will cooperate to ensure that mailing lists for providing notice of NPDES draft permits and applications for 401 Certification, include all appropriate state, local, and federal agencies, and other governmental entities.

For point source discharges requiring a permit from DEQ, joint permitting will ensure coordination with EPA. Notices of applications filed with DEQ will be published in a newspaper and mailing lists for notices of draft permits will include all affected states, and all local, municipal and federal agencies as required under 40 CFR §124.10. Comments will be accepted and public meetings will be held as required under 40 CFR §122.10, OAC 252:606 and applicable State law.

NONPOINT SOURCES

DEQ will coordinate with the Oklahoma Conservation Commission, which has the authority for monitoring, evaluation and assessment of waters to determine the extent of nonpoint source pollution and the development of conservation plans, including the authority to serve as the technical lead agency for Section 319 of the CWA except for activities related to industrial and municipal stormwater. DEQ will consult with the Conservation Commission to coordinate information and controls of pollutants relating to abandoned mine reclamation sites, soil conservation and erosion controls, conservation plans for clean lake watersheds, and wetlands strategy. The ODAFF and Corporation Commission will be involved in consultations and implementation of controls for nonpoint source discharges from all sources, activities and facilities under their respective jurisdictions as specified in the Code.

IMPLEMENTATION AND ENFORCEMENT OF THE OKLAHOMA WATER QUALITY STANDARDS

The CPP and updates thereof will be written by DEQ in cooperation with the Oklahoma Water Resources Board, which has authority under the Code and other statutes for promulgation of Oklahoma Water Quality Standards and implementation documents for such Standards. 27A OS Supp., 1993, §1-3-103(C) and 82 OS Supp. 1993, §1082.6. Enforcement actions for violations of the Oklahoma WQS will be conducted by DEQ, Corporation Commission, and ODAFF, in accordance with delineated boundaries of their jurisdictions under Section 1-3-101 of Title 27A of the Oklahoma Statutes.

FUNDING AND PRIORITIZATION

For wastewater treatment facilities and other funding activities, DEQ will coordinate and exchange information with the Oklahoma Water Resources Board (OWRB) and the Secretary of the Environment (OSE), which have authorities as follows:

OWRB	The State Revolving Fund (SRF) program, State water/wastewater loans and grants revolving fund and other related financial aid programs,
OSE	Other federal funding under the CWA.

The OWRB has authority for inventory and ranking of construction needs, and has established rules relating thereto in OAC 785. The 1987 Amendments to the Clean Water Act set forth a schedule and mechanism for completing the transition to achieve full State and municipal responsibility for financing, building, operating, maintaining and replacing wastewater treatment facilities. To facilitate the transition from the construction grants to the SRF program, the Clean Water Act provides

each state with the option to transfer a portion of its allotment from Title II authorizations for deposit, through a capitalization grant into a revolving fund.

EPA is authorized to make grants to capitalize State water pollution control revolving funds. The primary purpose of this authority is to provide loans and other financial assistance to municipalities for the construction of publicly owned wastewater treatment facilities. The last year in which funds could be appropriated for direct project funding through construction grants was FY-90. Separate appropriations for SRF capitalization grants are authorized from FY-89 through FY-96. Thereafter, the states and municipalities have the sole responsibility for providing financing to meet the enforceable requirements of the act unless funding for State SRF programs is re-authorized.

The Oklahoma Revolving Fund is a loan program that applies to all public projects receiving financial assistance from the Wastewater Facility Construction Revolving Loan Account for the construction or replacement of wastewater treatment works.

Development of the Oklahoma Revolving Fund was authorized by 82 OS Supp. 1988, Sections 1085.56 et seq. The program regulations are necessary for determining the eligibility and priority of entities to receive financial assistance pursuant to the Federal Water Quality Act of 1987 and the Wastewater Facility Construction Revolving Loan Account, and are contained in OAC 785. Legislation was passed in 2002 to allow State revolving funds to be used for nonpoint source pollution projects, and to give DEQ and OCC a greater role in prioritizing the applications for funds.

Projects, which are funded in whole or in part with assistance from the SRF will be required to comply with the requirements applicable State law and rules promulgated by the OWRB in OAC 785.

The categories of wastewater treatment projects eligible for assistance are as follows:

Secondary Treatment ..... Category I
Advanced Treatment ..... Category II
Infiltration/Inflow Correction ..... Category IIIA
Major Sewer System Rehabilitation ..... Category IIIB
New Collection Systems ..... Category IVA
New Interceptors ..... Category IVB
Combined Sewer Overflow Correction ..... Category V

The OWRB will determine annually the amount of funding necessary and the project categories that will be placed on the fundable portion of the Priority List (See Appendix 4-C).

Costs associated with the planning, design and building of the eligible categories of wastewater projects are considered allowable by the OWRB. Maximum eligible non-construction costs will be determined by guidelines developed by the OWRB. Eligible construction costs will be based on the lowest responsible bidder.

Eligibility for projects is subject to the applicable Subchapter 9, SRF Regulations (Parts 1, 3, 5 and 7) of the OWRB's rules in OAC 785. Funding and prioritization criteria and requirements are set forth in Appendix D of this Chapter.

ENSURE ADEQUATE INVOLVEMENT WITH OTHER ENTITIES

Ensure adequate involvement of entities with functions related to area wide waste management plans under Section 208 and applicable basin plans under Section 201 of the Clean Water Act. For permits which require revisions of the WQM Plan, coordination with other agencies and entities will be achieved through providing notice and opportunity for participation in compliance with 40 CFR Part 25, Chapter VI of the Environmental Quality Code, other applicable federal regulations, and the provisions of the CPP as set forth in herein.

RULEMAKING

Additional coordination can be achieved through allowing other state, local and federal entities an opportunity to comment on rules promulgated by the Environmental Quality Board which relate to the CPP and WQM Plan, nonpoint source pollution, groundwater quality, and point source discharges, contained in OAC 252:606 and OAC 252:611. Public comment and public meeting opportunities are provided for all permanent rules by DEQ in conjunction with the Water Quality Management Advisory Council and the Environmental Quality Board, as required by the Oklahoma Administrative Procedures Act, 75 OS 1991 §302 et seq. All State, local and federal entities may request to be placed on the mailing list for notices of rulemakings and a Notice of Rulemaking Intent with a description of proposed rules and other appropriate information is published in the *Oklahoma Register* a minimum of 20 days prior to a public meeting. The composition of both the Water Quality Management Advisory Council and the Environmental Quality Board, by law, must include members representing major interests such as agriculture, industry, nonprofit environmental organizations, local government, etc.

COMPLAINTS AND DATA MANAGEMENT

Guidelines and computerized systems for recording and analyzing information about complaints have been developed, are being utilized by all State environmental agencies, and information resulting from this process will be subject to disclosure to the public, including other agencies, pursuant to the Open Records Act. The complaint system is designed to direct complaints to the appropriate State agency with jurisdiction over the subject matter, to produce a timely response to each complaint and document the resolution of the complaint.

OFFICES OF CITIZEN, LOCAL GOVERNMENT AND BUSINESS ASSISTANCE AND POLLUTION PREVENTION ACTIVITIES

The Environmental Quality Code established within DEQ, a separate office with the express purpose of assisting citizens, local governments and businesses in interacting with DEQ and to provide these interests with information. The Office of Customer Services is staffed with persons with expertise in water quality and other environmental areas, and will act as a liaison with the Water Quality Division and other Divisions of DEQ in matters directed to them. Development and implementation of new pollution prevention activities are also a priority in the new DEQ, and these activities are being coordinated with local, regional and State governmental entities as appropriate.

WATER QUANTITY/WATER QUALITY

Coordination with the Oklahoma Water Resources Board, which has jurisdiction over water quantity matters, is ongoing with respect to matters with water quality implications. The OWRB and DEQ are coordinating agency rules involving construction requirements for wells to avoid inconsistency or overlap. The OWRB also has authority for Oklahoma's Comprehensive Water Plan, which has water quality implications. DEQ staff are cooperating with the OWRB in providing input to the Water Law Advisory Council on how water quality considerations may be accounted for in granting stream water appropriations and permits to withdraw groundwater under State statutes, assessing the need for State policy or law relating to minimum instream flows, flow augmentation, and resolving other water quantity/water quality issues.

NATURAL RESOURCE DAMAGES

The Secretary of Environment has been designated under the Environmental Quality Code as the Natural Resource Trustee of Oklahoma for purposes of the Oil Pollution Act of 1990 and CERCLA responsibilities. The Secretary will utilize appropriate State environmental agencies in carrying out natural resource trustee duties. The Board of Environmental Quality has adopted rules, contained in OAC 252:611, which provide DEQ with authority to fulfill duties pursuant to any contracts or memoranda of understanding with the Secretary regarding natural resource damage assessments and

related activities. The Department of Wildlife Conservation will be promulgating rules relating to wildlife damage assessments in relation to pollution incidents.

COORDINATE PLANNING EFFORTS WITH OTHER STATES, INTERSTATE COMPACT COMMISSIONS, AND REGIONAL ENTITIES

LOCAL GOVERNMENT COORDINATION

Coordination with local governmental entities, such as municipalities, is achieved by providing notices on individual point source discharge permits which may affect their area (in compliance with 40 CFR §124.10), the stormwater program and through cooperation in development of ordinances and regulations such as those designed for reservoir protection7.

REGIONAL PLANNING AGENCIES

Three substate planning agencies have been designated in Oklahoma, the Indian Nations Council of Governments (INCOG), the Association of Central Oklahoma Government (ACOG), and the Arkhoma Regional Planning Commission. These substate planning agencies have participated through past development of 208 WQM Plans for their respective areas, which have been incorporated into the State's WQM Basin Plans conditionally approved by EPA in 1979. Currently, the substate planning agencies are cooperating with DEQ in planning efforts to the extent resources allow.

Within the respective boundaries of the INCOG and ACOG areas, these entities will be responsible for the following activities:

- Identification of any new or modified Designated Management Agencies and coordination to secure properly executed acceptance forms;
- Preparation and submittal of requests for modifications to the WQM Plan, along with supporting documentation;
- Conducting "desktop" level wasteload allocations/TMDLs for municipal dischargers;
- Assisting with public participation activities related to the respective area;
- On-going review and recommendation of changes to the WQM Plan;
- Developing population projections including disaggregation to facility service areas;
- Additional targeted projects, including more detailed wasteload allocations/TMDL studies needed to comply with State and federal water quality modeling requirements and guidelines, whether grant funded or locally funded, may be negotiated as part of an annual workplan agreement.

When needed modifications to the Plan are identified by INCOG or ACOG, a request will be submitted to DEQ, Water Quality Division along with all necessary supporting documentation and technical justification. These materials will be reviewed by the technical staff and any comments addressed prior to submitting the modification to the Water Quality Division Director for approval. The proposed modification will be subject to the public participation procedures of this Chapter identified for minor and major modifications.

The ARKHOMA Regional Planning Commission has indicated their desire to be de-designated and relieved of any responsibility for water quality management planning activities in the two Oklahoma counties for which they had previous planning responsibility. The ARKHOMA Regional Planning Commission has not performed any water quality management planning activities in Oklahoma for several years. As soon as the official request is received, the de-designation process will be initiated. Responsibility for planning activities in LeFlore and Sequoyah counties will be exercised by DEQ. Proposed major and minor modifications identified by DEQ or others will be subject to the public participation procedures identified in this Chapter.

INTERSTATE COORDINATION

In addition to coordination through appropriate notification of affected states under the permit program for point source discharges, as specified in OAC 252:606, water quality issues and planning efforts are coordinated by the State through the following:

(1) Provision of draft plans such as 201 facility plans, updates to the State WQM Plan or basin plans, and similar documents will be provided to affected states where interstate implications are involved, and an opportunity to comment will be provided.

(2) Entities such as the Illinois River Task Force and the Scenic Rivers Commission are established to address specific situations and these entities regularly confer with pertinent governmental bodies in neighboring states. Other more informal contacts are also regularly made to address issues of mutual concern.

(3) Interstate Compact Commissions have been established and approved by appropriate State legislation as follows:

KANSAS-OKLAHOMA ARKANSAS RIVER BASIN COMPACT

The major purposes of this Compact are:

(a) To promote interstate comity between the states of Kansas and Oklahoma;

(b) To divide and apportion equitably between the states of Kansas and Oklahoma the waters of the Arkansas River Basin and to promote the orderly development thereof;

(c) To provide an agency for administering the water apportionment agreed to herein; and

(d) To encourage the maintenance of an active pollution-abatement program in each of the two states and to seek further reduction of both natural and man-made pollution in the waters of the Arkansas River Basin.

ARKANSAS-OKLAHOMA ARKANSAS RIVER BASIN COMPACT

The major purposes of this Compact are:

(a) To promote interstate comity between the states of Arkansas and Oklahoma;

(b) To provide for an equitable apportionment of the waters of the Arkansas River between the states of Arkansas and Oklahoma and to promote the orderly development thereof;

(c) To provide an agency for administering the water apportionment agreed to herein;

(d) To encourage the maintenance of an active pollution-abatement program in each of the two states and to seek the further reduction of both natural and man-made pollution in the waters of the Arkansas River Basin; and

(e) To facilitate the cooperation of the water administration agencies of the States of Arkansas and Oklahoma in the total development and management of the water resources of the Arkansas River Basin.

RED RIVER COMPACT

The principle purposes of this Compact are:

(a) To promote comity and remove causes of controversy each of the affected states by governing the use, control and distribution of interstate water of the Red River and its tributaries;

(b) To promote an equitable apportionment among the signatory states of the water of the Red River and its tributaries;

(c) To promote an active program for the control and alleviation of natural deterioration and pollution of the water of the Red River Basin and to provide for enforcement of the laws related thereto;

(d) To provide the means for an active program for the conservation of water, protection of lives and property from floods, improvement of water quality, development of navigation and regulation of flows in the Red River Basin; and

(e) To provide a basis for State or joint State planning and action by ascertaining and identifying each state share in the interstate water of the Red River Basin and the apportionment thereof.

CANADIAN RIVER COMPACT

The major purposes of this compact are:

(a) To promote interstate comity;

(b) To remove causes of present and future controversy;

(c) To make secure and to protect present developments within the states and;

(d) To provide for the construction of additional works for the conservation of the waters of the Canadian River.

The State interacts with these Compacts primarily through the Secretary of the Environment and the Oklahoma Water Resources Board. The Board has statutory authority for water quantity, including but not limited to, water rights, surface and underground water, planning and interstate stream compacts pursuant to 27A OS Supp. 1993, §1-3-103(C).

PROCEDURES FOR ISSUING FISH CONSUMPTION ADVISORIES

DEQ has statutory authority to issue fish consumption advisories pursuant to OAC 27A: 2-6-1-6. Fish tissue contaminant levels, triggering an advisory, are calculated according to EPA risk assessment guidance. This approach is consistent with the agency-wide policy on risk-based decisions and allows protection of the public, especially vulnerable populations such as fetuses and children. It also encourages the beneficial consumption of fish.

The method for determining fish tissue contaminant levels which trigger a consumption advisory can be found in the EPA Guidance Document *Fish Assessment and Fish Consumption Limits, 2000*. DEQ may also use alternate methods for specific advisory scenarios not covered by EPA's Guidance, such as site-specific advisory levels for lead.

For contaminants which are carcinogens, the chemical concentration at which the general population could safely consume fish is calculated using the following formula:

$$C = \frac{RL \; x \; BW \; x \; PF \; x \; EDF \; x \; Tap}{CSF \; x \; MS \; x \; MM}$$

Where:

C = Acceptable Concentration in edible fish portion (mg/kg)
RL = Acceptable risk level for increase in cancer incidence over background (10^{-5})
BW = Average body weight (70 kg)
PF = Preparation factor (2.0) which assumes a 50% decrease in contaminant levels resulting from preparation and cooking
EDF = Exposure duration factor (2.33). Cancer risk calculations are based on a lifetime exposure of 70 years. EDF assumes 95% of the population will move to a new geographic area at least once per 30 years. 70/30 = 2.33.
T_{ap} = Time averaging period (30 days per month)
CSF = Cancer slope factor(varies by contaminant)
MS = Meal size(0.227 kg for adults with the assumption that children will consume proportionally smaller meals)
MM = meals per month

Advisory levels for carcinogenic contamiants apply to the general population. Advisory levels are calculated for 2 meals per month and 0.5 meal per month scenarios. Advisories recommending restricted consumption are triggered when concentrations in fish routinely exceed the 2 meal per month concentration. When concentrations in fish routinely exceed the 0.5 meal per month level, the general population is advised not to consume the fish.

For contaminants that present non-carcinogenic health concerns, the chemical concentration at which the sensitive population could safely consume 2 meals per month is calculated using the following formula:

$$C = \frac{RfD \; x \; BW \; x \; Tap}{MM \; x \; MS}$$

Where:
C = Acceptable concentration in edible fish portion (mg/kg)
RfD = Reference Dose (mg/kg-day^{-1})
BW = Average body weight (70 kg)
T_{ap} = Time averaging period (30 days per month)
MS = Meal size(0.227 kg for adults with the assumption that children will consume proportionally smaller meals)
MM = meals per month

The same restricted consumption and no consumption advisory plan is used for non-carcinogenic contaminants with the exception of mercury which utilizes a 3-tiered system.

TOXICS AND RESERVOIRS PROGRAM

GOALS

The goal of the Toxics and Reservoirs program is to protect the public's health by evaluating levels of commonly found toxic compounds in fish flesh from Oklahoma's reservoirs.

This will be accomplished by targeting three general categories of fish for collection and analysis: predator species, bottom feeders, and rough fish. This will ensure that species analyzed are those most susceptible to bioaccumulation of toxics and most frequently consumed.

SAMPLE COLLECTION METHODS

Since the intent of the program is to measure toxics in fish flesh, any legal method of obtaining uncontaminated samples is acceptable. DEQ personnel will collect samples by use of gill nets, seines, or electrofishing. In addition, samples may also be provided by ODWC or other cooperating agencies. ODWC generally uses electrofishing as a collection method.

Generally, reservoirs will be routinely sampled every 7 years. If sample results indicate elevated levels of toxics, sampling frequency will be increased to a level adequate to track changes in contamint concentrations.

The table below lists the reservoirs routinely sampled.

TABLE 26: RESERVOIRS ROUTINELY SAMPLED

Reservoir			
Lake Arcadia	Lake Fuqua	McAlester City Lake	Lake Texoma
Altus-Lugert Reservoir	Fort Supply Reservoir	McGee Creek Reservoir	Webbers Falls Lock & Dam
Lake Arbuckle	Grand Lake	Lake McMurtry	Lake Wister
Lake Atoka	Great Salt Plains Reservoir	Lake Murray	Waurika Lake
Broken Bow Reservoir	Greenleaf Lake	Newt-Graham Lock & Dam	
Birch Lake	Guthrie Lake	Lake Oologah	
Boomer Lake	Lake Hudson	Lake Overholser	
Lake Carl Blackwell	Lake Hefner	Pine Creek Reservoir	
Canton Lake	Hugo Lake	R.S. Kerr Reservoir	
Copan Reservoir	Hulah Reservoir	Sardis Lake	
Draper Lake	Lake Heyburn	Shawnee Lake	
Lake Eufaula	Kaw Reservoir	Skiatook Lake	
Lake Ellsworth	Lake Keystone	Lake Thunderbird	
Ft. Gibson Reservoir	Liberty Lake	Lake Tenkiller	
Foss Reservoir	Lake Lawtonka	Tom Steed Reservoir	

SPECIES SELECTION

For organic contaminants, fish will be composited according to size and species for analysis. A valid composite consists of 3 to 8 individuals of the same species with the smallest fish being at least 75% the length of the largest. Only valid composites will be analyzed.

For mercury, analysis will be performed on individual fish. Results will be averaged for evaluation. Generally, the same rules of compositing apply. However, individual specimens falling outside the composite size range may be analyzed to provide additional information for modeling purposes.

To provide the best screening tool for the evaluation of concentrations of toxics that could affect human health, it is desired that each category of fish be available for analysis. For screening purposes, it is necessary that only one composite be run for each category of fish. If the preferred species is available, that species should be chosen for analysis. If the preferred species is not available for a given category, then one of the other acceptable species may be analyzed. If more than one composite of a selected species is available, the composite of the largest individual fish should be chosen for analysis.

Table 27 lists the preferred fish and other acceptable species.

TABLE 27: PREFERRED FISH AND OTHER ACCEPTABLE SPECIES

Category	Preferred Species	Acceptable Species
Predators	Largemouth Bass	Hydbrid, White, or Striped Bass, Walleye, or Flathead Catfish
Bottom Feeders	Channel Catfish or Blue Catfish	Black Bullhead
Rough Fish	Smallmouth Buffalo	Carp, River Carpsucker, Largemouth Buffalo

Upon receipt in the laboratory, all fish will be separated by species and weighed and measured. These values will be recorded and the fish will be composited according to length recommendations. Filets will be collected from each fish and combined into the appropriate composites. The composited filets will be wrapped in aluminum foil and labeled according to site, species, and size. All composites will be held frozen until sample analysis and data evaluation is complete. Composites selected for analysis will be logged in and held in a separate plastic container. Composites not selected for

analysis will be combined according to site and held frozen in labeled plastic bags until the screening process is complete.

The samples chosen for analysis will be logged into the SELS Laboratory Information Management System (LIMs). The samples will be held frozen separately until prepared for analysis. Information entered into the SELS LIMs is shown in Table 28.

TABLE 28: INFORMATION TO BE INCLUDED IN THE SELS LIMS

Field	Description
Project Code	The appropriate project code – generally TS-XF
Date Collected	Date of collection
Station ID	The Aquarius station ID, if available. Reserve this field if station ID has not yet been assigned.
Source	The total number, number analyzed, and species of the sample, e.g "5 of 7 Largemouth Bass."
Samplers' Comments	The site name, collecting agency (if not DEQ), and other pertinent information.
Length	Mean(for composites) or individual length in millimeters
Weight	Mean(for composites) or individual weight in grams
Species	Common species name

SAMPLE ANALYSIS

Sample preparation, analytical methods, detection limits, and QA/QC procedures are spelled out in the SELS Quality Assurance Project Plan. (http://www.deq.state.ok.us/SELSD_QAP_2011.pdf)

DATA ANALYSIS

Screening values will be used to determine potential problems and if other samples and species need to be analyzed. Screening levels for chlorinated organics will be set at 66% to 75% of the lowest level at which a consumption advisory would be issued. Screening levels for Hg will be set at 0.3 mg/kg, which corresponds to EPA's water quality (WQ) criterion for methyl mercury. Screening levels are shown in Table 29.

TABLE 29: SCREENING VALUES TO IDENTIFY POTENTIAL CONCERNS

Contaminant	Screening Value (mg/kg)	Lowest Consumption Advisory Value (mg/kg)
Aldrin	0.012	0.015
Chlordane	0.450	0.600
DDT	0.460	0.650
Dieldrin	0.012	0.015
Endrin	1.125	1.500
Heptachlor	0.035	0.050
Mercury	0.300	0.500
PCBs	0.080	0.110
Toxaphene	0.150	0.200

If composite or mean species concentrations at a given site fall below the screening values, the other composites will not be analyzed. If composite or mean species concentrations exceed the screening value, all the held samples from that site will then be logged in and analyzed.

SAMPLE FREQUENCY

Reservoirs will be routinely sampled once every seven years.

If during routine sampling screening values are exceeded, samples will be recollected as soon as practicable with emphasis on collecting the species and categories of fish that exceeded the screening levels. If sample results for a site exceed screening levels, that site will be recollected periodically for the species and categories showing contamination. The occurrence of recollection will be determined by the level of contamination and the likelihood that factors have occurred that would influence contaminant levels in the fish eg changes in contaminant sources or loading.

If a site has a consumption advisory issued for it, that site will be sampled for the species or category of fish for which the consumption advisory applies at a frequency which would allow the tracking of fish contaminant levels over time as contaminant sources or loading values change.

CONSUMPTION ADVISORIES

Consumption advisories may be issued for a particular species or a general category of fish, e.g. predator species. Consumption advisories may also be issued within size ranges, e.g., Largemouth bass greater than 14" in length.

Consumption advisories will only be issued after sampling indicates contaminant levels consistently above DEQ standards. Generally, this will mean at least two sampling events. The use of selective sampling techniques will be used to try to determine if only certain species or categories of fish are affected.

DEQ may use mathematical models such as the *National Descriptive Model of Mercury in Fish* to assist in consumption advisory issuance. Models may only be used to determine affected size classes within species and may not be used to issue advisories on species not collected.

Consumption advisories will only be issued with the cooperation of the Oklahoma Department of Wildlife Conservation. In addition other interested parties will be notified and consulted before consumption advisories are issued. These may include other state and federal agencies, tribes, and municipalities.

Consumption advisories will be rescinded only after sampling indicates contaminant levels consistently below DEQ standards. Generally, this will mean three consecutive sampling events. Table 30 lists the levels at which consumption advisories will be issued.

TABLE 30: CONTAMINANT LEVELS AT WHICH CONSUMPTION ADVISORIES WILL BE ISSUED

Contaminant	Level (mg/kg)	Recommendation
Aldrin	0.015	General population should consume no more than 2 meals per month with fat trimmed and skin removed
	0.050	No consumption
Chlordane	0.600	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	2.500	No consumption.
DDT	0.650	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	2.500	No consumption.
Dieldrin	0.015	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	0.050	No Consumption
Endrin	1.500	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	5.500	No Consumption
Heptachlor	0.050	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	0.200	No consumption.

Contaminant	Level (mg/kg)	Recommendation
Mercury	0.500	2 meals per month by women of child bearing age (15-45), or children up to age 15.
	1.000	No consumption by women of child bearing age (15-45) or children up to 15 years of age. General population should consume no more than 2 meals per month.
	1.500	No consumption.
PCBs	0.110	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	0.440	No consumption.
Toxaphene	0.200	General population should consume no more than 2 meals per month with fat trimmed and skin removed.
	0.800	No consumption.

APPENDIX A: SAMPLE 208 FOR INDUSTRY

208 INDUSTRIAL FACTSHEET							
FACILITY:	**WYNNEWOOD REFINING COMPANY**				**CITY/TOWN:**	WYNNEWOOD	
FACILITY LEGAL LOCATION:	S 28 T2N R1E I.M. NW/NE/NE				**COUNTY:**	GARVIN	
NPDES #	OK0000825				**SIC CODE:**	2911	
STATE FACILITY NUMBER:	I-25000220		**OPERATIONS DESCRIPTION:**			Petroleum refinery	
OUTFALL NUMBER:	**001**						
WASTE WATER DESCRIPTION:	Treated effluent from the refinery's wastewater treatment system. This receives general process & wash water from crude desalting, cooling tower & boiler blow down, laboratory wash water, commingled process & storm water, sour water stripper & other refinery process units, treated groundwater from an on-site groundwater remediation project, and storm water from a small ammonium thiosulfate plant.						
TREATMENT PROCESS:	3-cell polishing lagoons; activated sludge						
EVALUATION TYPE:	Wasteload allocation study						
CRITICAL EFFLUENT FLOW(MGD): (Highest 30 day average flow, enter the value or NA)	0.987	**PROJECTED MAXIMUM FLOW** (MGD):	1.16				
POINT OF DISCHARGE:	S28 T2N R1E I.M. NW/NE/NE	**LATITUDE:**	34° 37' 21.19"	**LONGITUDE:**	97° 11' 57.21"		
RECEIVING STREAM:	Washita River (upper Red River basin)			**SEGMENT:**	310810		
7 DAY 2 YEAR LOW FLOW (MGD):	76.91 (2011)			**STREAM CLASS:**	Perennial		
WASTELOAD ALLOCATION: **For Dissolved Oxygen Demanding Substances** (Final Discharge only, no internal monitoring points) **THESE ARE TECHNOLOGY-BASED LIMITS**	pH: 6.5 – 9.0 s.u. **MONTHLY AVERAGE** Ammonia: 288.58 lb/day BOD5: 594.62 lb/day COD: 4140.80 lb/day Chromium: 5.06 lb/day Phenols: 3.88 lb/day Sulfide: 2.79 lb/day Hexavalent Chromium: 0.44 lb/day Total Suspended Solids (TSS): 476.89 lb/day Oil and Grease: 173.87 lb/day **DAILY MAXIMUM** Ammonia: 634.87 lb/day BOD5: 1071.51 lb/day COD: 8012.26 lb/day Chromium: 14.52 lb/day Phenols: 7.98 lb/day Sulfide: 6.25 lb/day Hexavalent Chromium: 0.99 lb/day Total Suspended Solids (TSS): 747.17 lb/day Oil and Grease: 327.32 lb/day						
OUTFALL NUMBER:	**002**						
WASTE WATER DESCRIPTION:	Stormwater runoff from non-process areas of the refinery						
TREATMENT PROCESS:	Sedimentation lagoon						
RECEIVING STREAM:	Unnamed tributary of Turkey Sandy Creek which is a tributary of Kickapoo Sandy Creek which is a tributary of the Washita River						
STREAM CLASS:	Intermittent	**SEGMENT:**	310810				
7 DAY 2 YEAR LOW FLOW (MGD):	0.6463	**POINT OF DISCHARGE:**	S23 T2N R1E I.M. NW/SW/SE				
LATITUDE:	34° 37' 30.26"	**LONGITUDE:**	97° 10' 6.45"				
WASTELOAD ALLOCATION: For Dissolved Oxygen Demanding Substances (Final Discharge only, no internal monitoring points)	pH: 6.5 – 9.0 s.u. DAILY MAXIMUM COD: 120 mg/l Oil and Grease: 15 mg/l						
				EPA APPROVAL DATE:	3/19/2012		
				RECORD LAST UPDATE:	4/4/2012		

APPENDIX B: SAMPLE 208 FOR MUNICIPALITIES

FACILITY:	HYDRO	CITY/TOWN:	TOWN OF HYDRO
LEGAL:	S03 R13W T12N NW/SW/SE	COUNTY:	CADDO
POD:	S03 R13W T12N NW/SW/SE	SEGMENT:	520620
LATITUDE:	35° 32' 24.598" N	LONGITUDE:	98° 33' 43.546" W
NPDES #	OK0028185	FACILITY I.D.:	S-20607

CURRENT TREATMENT PROCESS:	Activated sludge with extended aeration		
PRESENT AVG. DAILY FLOW (MGD):	0.038	2010 CENSUS POPULATION:	692
DESIGN AVG. DAILY FLOW (MGD):	0.14	2030 PROJECTED POPULATION:	840

RECEIVING STREAM:	DEER CREEK	OK WBID	OK520620060010_00
7 DAY 2 YEAR LOW FLOW (MGD):	0	STREAM CLASS:	INTERMITTENT

DMA:	TOWN OF HYDRO AND HYDRO DEVELOPMENT AUTHORITY	DMA STATUS:	APPROVED JOINT DMA

WASTELOAD ALLOCATION: SECONDARY (BOD5 20 mg/L; TSS 30 mg/L; DO 2 mg/L)

STRATEGY:

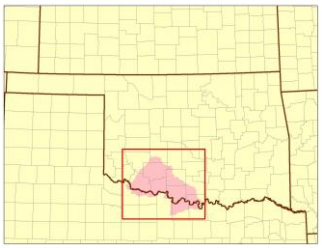
RECOMMENDED TREATMENT ALTERNATIVES

A) LAND APPLICATION
B) UPGRADE
C) TOTAL RETENTION

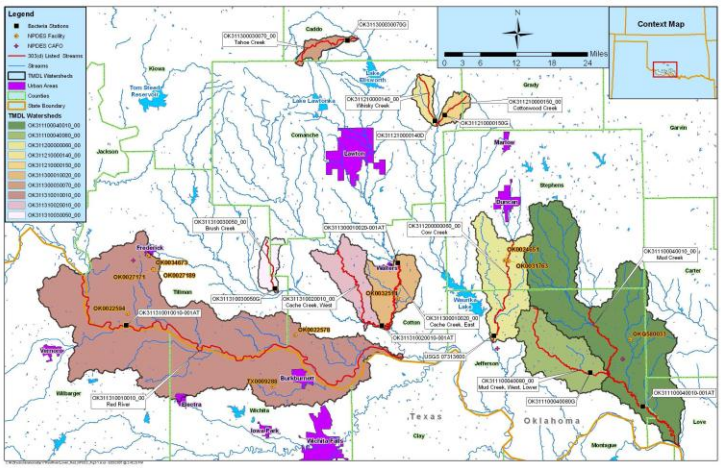
EPA APPROVAL DATE: 7/23/1986
RECORD LAST UPDATED: 01/03/2012

Approved new joint DMA 1/3/2012, updated treatment process, corrected receiving stream, updated present population with 2010 Census data, corrected projected population, and added latitude/longitude.

Lower Red River Basin Bacterial TMDLs



Location: The Lower Red River Basin refers to a collection of creeks flowing into the Red River basin in the southern part of west Oklahoma. The creeks of the Lower Red River Basin flow mostly into Caddo, Comanche, Tillman, Cotton, Stephens, Jefferson, Carter, and Love Counties. The Lower Red River Basin area is located in the West Cache, Cache, Northern Beaver, and Farmers-Mud Watersheds. The impaired creeks in the Lower Red River study area included Mud Creek (OK311100040010), Lower West Mud Creek (OK311100040080), Cow Creek (OK311200000060), Whisky Creek (OK311210000140), Cottonwood Creek (OK311210000150), East Cache Creek (OK311300010020), Tahoe Creek (OK311300030070), Red River (OK311310010010), West Cache Creek (OK311310020010), and Brush Creek (OK311310030050).



Beneficial Uses: Beneficial uses in the Lower Red River Basin include Primary Body Contact Recreation (PBCR), public/private water supply, warm water aquatic community, industrial and municipal process and cooling water, agricultural water supply, fish consumption, emergency water supply, sensitive water supply and aesthetics. Only the PBCR designated use was addressed in this TMDL study: http://www.deq.state.ok.us/wqdnew/tmdl/lower_red_river_pathogen_tmdl_17_sep_2007.pdf

Causes of Impairments: Point sources are permitted through the NPDES program. NPDES-permitted facilities that discharge treated wastewater are required to monitor for one of the three bacterial indicators (fecal coliform, *E coli*, or Enterococci), in accordance with their permits. Waste Load Allocations (WLAs) for each of the pathogens exist for the five, active municipal NPDES-Permitted Facilities that discharge into the Lower Red River Basin (Town of Ringling, Town of Temple, Town of Devol, City of Frederick - Industrial Park, and City of Frederick - East WWTP).

There are six NPDES no-discharge facilities in the Lower Red River Basin, but these do not contribute to pathogens in the basin unless there is a large rainfall that might cause them to overflow. In addition, there are two CAFOs (Concentrated Animal Feeding Operation) in the Lower Red River Basin. CAFOs are required to protect water quality through the use of best management practices (BMPs) by the Agricultural Environmental Management Services (AEMS) of the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). BMPs include dikes, berms, terraces, ditches, or other similar structures used to isolate animal waste from outside surface drainage. As a result, CAFOs are also considered "no-discharge" facilities.

Nonpoint sources are diffuse sources that typically cannot be identified as entering a waterbody through a discrete conveyance at a single location. After analyzing the various types of nonpoint sources and their anticipated bacterial loads, the TMDL study came to the conclusion that nonpoint sources are the major sources of bacteria in the Lower Red River Basin (see Table 3-13 of the TMDL). Nonpoint source pollution is addressed by the Oklahoma Conservation Commission.

EPA Approval Date: 9/21/2007
Record Last Updated: 9/21/2012

Whisky Creek
(1 TMDL for Fecal Coliform)
(OK WBID #311210000140)
[Part of the Lower Red River Basin Bacterial TMDL]

Monitoring Site on Whisky Creek
Latitude 34° 42' 36.7"; Longitude 98° 10' 8.5"; Comanche County; Section 29, Township 3 North, Range 9 West, NE/NE/NW

Whisky Creek does not meet its designated beneficial uses for:

- **Primary Body Contact Recreation (PBCR)**

Whisky Creek is impaired with

- **Enterococci** (2006 303d list)
- **E-Coli** (2006 303d list)

A TMDL was developed for the impaired use of PBCR. The TMDL can be found online at: [http://www.deq.state.ok.us/wqdnew/tmdl/lower_red_river_pathogen_tmdl_17_sep_2007.pdf]

As a result of the TMDL study, this non-point source load reduction in the Whisky Creek is needed to meet standards for bacterial impairment:

Fecal Coliform: 44%

EPA Approval Date: 8/10/2007
Record Last Updated: 9/21/2012

APPENDIX D: SRF DRAFT PROJECT PRIORITY LIST

STATE OF OKLAHOMA
Appendix A. FY 2012-2016 Clean Water SRF Project Priority List
Prepared for the EPA - Effective July 1, 2011 - June 30, 2012
July 1, 2011

	Ranking	OPDES Permit #	Loan Type	Name	Disadvantaged Community Y/N	Project No.	Target B.C. Date	Priority List Amount	Project Description
FY 2012 Fundable Projects (July 2011 - June 2012)									
1	435	None	LC	Nicoma Park DA	Y	ORF-09-0035	08/09/11	$160,000	New Sewer Collection System (Cat. IVA)
2	340	OK0032573	LC	Muldrow PWA	Y	ORF-11-0007	10/11/11	$3,215,000	Wastewater Treatment Facility Improvements (Cat. II)
3	380	None	LC	Elgin PWA	Y	ORF-10-0005	08/09/11	$3,364,000	Total Retention Lagoon Improvements & Rehab and New Aeration Lagoons(Cat. I & IIIB)
4	290	OK0034266	LC	Lone Grove W&ST	Y	ORF-04-0011	02/14/12	$12,000,000	New WWTP, Lift Station and Force Mains (Cat. II, IIIB, & IVB)
5	290	OK0029131	LC	Muskogee UA	Y	ORF-11-0008	08/13/11	$12,775,000	Wastewater Collection System Rehabilitation (Cat. IIIB)
6	285	NS-OK0026221 SS-OK0026239	LC	Tulsa MUA	Y	ORF-11-0005	08/09/11	$16,700,000	Lower Bird Creek WWTP Expansion (Cat. II)
7	280	OK0020303	LC	Owasso PWA	N	ORF-10-0014	08/09/11	$2,940,000	New Liftstaion and Upgrade to Existing Force Main and Existing Appurtances (Cat. IVB)
8	280	OK0028185	LC	Hydro PWA	Y	ORF-12-0001	12/13/11	$3,500,000	New WWTP (Cat. II)
9	270	OK0027138	LC	Glenpool USA	N	ORF-11-0002	08/09/11	$3,750,000	WWTP Upgrade and Rehabilitation (Cat. I)
10	240	OK0032549	LC	Bristow PWA	Y	ORF-12-0002	03/13/12	$1,050,000	WWTP Improvements (Cat. II)
11	195	NS-OK0026221 SS-OK0026239	LC	Tulsa MUA	Y	ORF-12-0003	10/11/11	$26,472,000	Sanitary Sewer and WWTP Rehabilitation and Improvements (Cat. I, IIIA, & IIIB)
12	185	OKG582226 OKG580005	LC	Wetumka PWA	Y	ORF-12-0004	02/14/12	$3,500,000	New WWTP (Cat. I)
13	180	OK0021512	LC	Vian PWA	Y	ORF-11-0006	10/11/11	$1,555,000	New FEB (Cat. II)
14	145	OK0028045	LC	Altus MA	Y	ORF-12-0005	04/10/12	$1,951,250	WWTP Improvements and Grey Water Irrigation System (Cat. II & X)
15	160	None	LC	Geronimo PWA	Y	ORF-12-0006	07/12/11	$1,500,000	Wastewater Treatment Facility Rehabilitation (Cat. IIIB)
16	170	OK0027618	LC	Hominy PWA	Y	ORF-12-0007	01/10/12	$600,000	WWTP Improvements (Cat. II)
17	145	OK0033464	LC	Sperry USA	Y	ORF-12-0008	03/13/12	$443,900	New Sanitary Sewer Line and Appurtenances to Serve Unsewered Area (Cat. IVA)
18	145	OK0026239	LC	Norman UA	Y	ORF-12-0009	01/10/12	$26,000,000	WWTP Improvements (Cat. II)
19	140	OK0029173	LC	Tuttle PWA	Y	ORF-12-0010	12/13/11	$2,000,000	New Sewer Main and Additional Lagoon and Appurtenances (Cat. I & IVB)
20	140	OK0029009	LC	McLoud PWA	Y	ORF-12-0011	05/08/12	$1,750,000	New Collection Line (Cat. IVA)
21	135	OK0040053	LC	Broken Arrow MA	N	ORF-12-0012	03/13/12	$4,000,000	Truck Sewer Replacement (Cat. IIIB)
22	130	OK0039063	LC	Durant CUA	Y	ORF-12-0013	04/10/12	$1,025,000	Sludge Belt Filter (Cat. II)
FY 2013 Planning/Contingency Projects (July 2012 - June 2013)									
1	195	NS-OK0026221	LC	Tulsa MUA	Y	Unassigned	10/09/12	$43,920,000	Sanitary Sewer and WWTP Rehabilitation and Improvements and New Interceptor (Cat. I, IIIA, IIIB, & IVB)
2	185	OK0029131	LC	Muskogee UA	Y	Unassigned	09/11/12	$24,710,000	Wastewater Collection System Rehabilitation (Cat. IIIB)
3	175	OK0026816	LC	Mustang IA	N	Unassigned	03/12/13	$7,480,000	Phase II WWTP Expansion and Improvements (Cat. II & IIIB)
FY 2014 Planning/Contingency Projects (July 2013 - June 2014)									
1	195	NS-OK0026221 SS-OK0026239	LC	Tulsa MUA	Y	Unassigned	10/08/13	$41,365,000	Sanitary Sewer and WWTP Rehabilitation and Improvements and New Interceptor (Cat. I, IIIA, IIIB, & IVB)
FY 2015 Planning/Contingency Projects (July 2014 - June 2015)									
1	195	NS-OK0026221 SS-OK0026239	LC	Tulsa MUA	Y	Unassigned	10/07/14	$24,065,000	Sanitary Sewer and WWTP Rehabilitation and Improvements and New Interceptor (Cat. I, IIIA, IIIB, & IVB)
FY 2016 Planning/Contingency Projects (July 2015 - June 2016)									
1	195	NS-OK0026221 SS-OK0026239	LC	Tulsa MUA	Y	Unassigned	10/06/15	$29,440,000	Sanitary Sewer and WWTP Rehabilitation and Improvements and New Interceptor (Cat. I, IIIA, IIIB, & IVB)

LC = Long-term Construction Loan
NC = Non-Construction Loan
R = Refinance
GPR = Green Reserve Project

Loan Totals (All Loans)

FY 12	$130,251,150
FY 13	$76,110,000
FY 14	$41,365,000
FY 15	$24,065,000
FY 16	$29,440,000
TOTALS	**$301,231,150**

APPENDIX E: SRF REQUIREMENTS

PROGRAM DESCRIPTION

The Clean Water SRF program is a low-interest loan program to assist communities with municipal wastewater infrastructure and other pollution control projects.

ELIGIBLE PROJECTS

Eligible projects include:

- Wastewater treatment, collection, storage, disposal infrastructure, or equipment (new construction to serve existing communities or rehabilitation.) Collections systems, which primarily serve undeveloped areas will not be eligible for assistance.
- Urban Stormwater activities
- Watershed management/non-point source pollution control activities (capital improvements, equipment, environmental clean-up, land acquisition, or implementation of management practices to protect and improve surface or ground water)
- Engineering/technical planning, monitoring, assessment, design, construction of eligible projects
- Energy or water efficiency projects; green infrastructure; environmentally innovative projects
- Brownfields assessment/remediation
- Wastewater system security

TYPES OF ASSISTANCE AVAILABLE

CWSRF may be used for the following purposes:

To make loans on the condition that:

- Such loans are made at or below market interest rates, including interest free loans at terms consistent with the federal Water Quality Act of 1987 or as otherwise authorized by the Environmental Protection Agency.
- Principal and interest payments will commence not later than one year after project completion and all loans will be fully amortized not later than 30 years after project completion.
- The recipient of a loan will establish a dedicated source of revenue for repayment of loans.

To buy or refinance the debt obligation of eligible applicants within the State at or below market rates, when such debt obligations were incurred and construction started after March 7, 1985, for the sole purpose of funding projects that meet the following requirements:

- The applicant is the approved designated management agency.
- The project is consistent with the water quality management plan.
- The project must be listed on the State priority list.
- The project has complied with requirements of these regulations and has been approved by the Board.
- The project must have approved plans and specifications and construction permit issued by DEQ.

For the reasonable costs of administering the fund and conducting activities under Title VI of the Act, not to exceed 4% of the federal capitalization grant awards.

CAPACITY FUNDING LIMITATIONS

The eligible capacity shall be determined using average dry weather flow and peak flows in accordance with population and per capita flow estimates provided by the applicant. Project capacity must be consistent with environmental constraints.

Eligible capacity for treatment plants will be up to a period of 30 years from the estimated date of initiation of construction.

Eligible capacity for interceptors and outfalls will be up to 40 years from the estimated date of initiation of construction.

Eligible capacity shall be calculated by multiplying the OWRB's approved local population projection by an appropriate local per capita flow figure. The flow thus calculated will be deemed to include all the eligible project flows (residential, commercial, federal facilities, industrial, and infiltration/inflow). Eligible capacity will be determined during the development of the planning documents. The applicant will be responsible for documenting, in the planning document, the peaking factors used for the project. Eligible capacity will be determined when planning documents are approved by the Board.

POPULATION AND FLOW PROJECTIONS

Section 208 Water Quality Management Plan population and flow projections will be used to determine the eligible project capacity. A discussion of the local projections should be included in the planning document.

LAND COSTS

Allowable costs for land and rights-of-way include the cost (including associated legal, administrative, and engineering costs) of land acquired in fee simple or by lease or easement that will be an integral part of the treatment process or that will be used for the ultimate disposal or residues resulting from such treatment.

SYSTEM CAPACITY

The applicant must demonstrate that it has legal, institutional, managerial and financial capability to construct, operate and maintain the treatment works. The applicant will be required to prepare a revenue program, user charge system and establish an acceptable dedicated source of revenue to repay the loan. The applicant will be required to identify and make projections of the amount of revenue available from specific sources necessary to repay the loan.

A proposed Revenue Program must be prepared and submitted with the Planning Report. The proposed Revenue Program shall be updated as appropriate prior to submission of the formal assistance application. As indicated, the recipient will be required to demonstrate, at the time of the actual application (at the approval to award stage), that a "dedicated" source of revenue is available to repay the loan. Revenue will be considered dedicated when the recipient passes an ordinance or a resolution committing a source or sources of funds for repayment.

The resolution or ordinance dedicating a source of funding for repayment of the loan and final Revenue Program must be adopted before finalization of the loan agreement. The final approved Revenue Program should be reviewed annually during the useful life of the project and modified as necessary by the Board.

INTENDED USE PLAN

Each fiscal year the Board shall prepare, an Intended Use Plan (IUP) which shall be subjected to public review. The IUP will identify projects anticipated to receive financial assistance from that year's appropriation. The IUP will comply with Federal Clean Water Act CWSRF guidance and shall include the following items:

A description of both the short and long term goals and objectives of the fund.

Assurances for meeting the requirements of Section 602(b) of the Act:

- The Board will enter into binding commitments equal to 120% of the capitalization grant payments within one year after the receipt of the grant payment.
- All funds will be expended in an expeditious manner.
- All capitalization grant funds will first be used toward compliance with the enforceable requirements of the Act, including the municipal compliance deadline of July 1, 1988, and
- All projects funded with capitalization grant funds with construction starts prior to October 01, 1994 will meet the requirements under Sections 201(b), 201(g)(1), 201(g)(2), 201(g)(3), 201(g)(5), 201(g)(6), 201(n)(1), 201(o), 204(a)(1), 204(a)(2), 204(b)(1), 204(d)(2), 211, 218, 511(c)(1), and 513 of the Act.

PAYMENT AND DISBURSEMENT SCHEDULE

Included in the IUP are the criteria and method that are established for distribution of funds.

- The Board shall prepare a preliminary IUP prior to the beginning of each federal fiscal year. The applicants considered for funding will be those legal entities that have indicated to the Board that they desire to receive assistance within the next federal fiscal year. The preliminary IUP will be subjected to a public participation, including a public meeting.
- Each project to be included on the Project Priority List of the IUP shall be ranked according to priority points and shall be ranked using the Integrated Priority Rating System

CWSRF INTEGRATED PRIORITY RATING SYSTEM

The Board will utilize an integrated priority ranking system to evaluate and rank proposed projects, including treatment works, nonpoint source activities, and urban storm water activities, based on the relative impact of the project in achieving the water quality objectives of the Act. This system consists of criteria integrating public health protection and Oklahoma's Water Quality Standards beneficial use maintenance and protection goals and Anti-degradation policy, including project type, water quality restoration, water quality protection, and readiness to proceed.

1. **Project Type Factor**. The Project Type Factor provides a maximum of seventy (70) points for proposed water quality projects based on the following:
    a. Treatment works or water quality projects designed to effectively eliminate or reduce a documented source of human health threat and/or discharge permit limit violation within a watershed of a waterbody being utilized as a public water supply shall receive seventy (70) points.
    b. Treatment works or water quality projects designed to effectively eliminate or reduce a documented source of human health threat and/or discharge permit limit violation shall receive sixty (60) points.
    c. Treatment works or water quality projects designed to sustain compliance with or provide a degree of treatment beyond permit limits; increase capacity, reliability, or efficiency; reclaim/reuse wastewater; reduce a documented water quality threat, or otherwise maintain beneficial uses shall receive thirty (30) points.
    d. All other eligible treatment works or pollution control projects shall receive twenty (20) points.
2. **Water Quality Restoration Factor**. The Water Quality Restoration Factor provides a maximum of twenty (20) points for proposed projects located on waterbodies which are not meeting the beneficial uses assigned to them in Oklahoma's Water Quality Standards and which are listed on Oklahoma's 303(d) list as threatened or impaired. The water quality restoration factor will be subject to change whenever the 303(d) List is revised. Water quality projects meeting the following criteria shall receive additional priority points:
    a. A project located in a watershed listed as a "Top Ten NPS Priority Watershed" in Oklahoma's Nonpoint Source Management Program shall receive an additional ten (10) points.
    b. A project listed on Oklahoma's 303(d) list of threatened or impaired stream segments shall receive an additional five (5) points.

c. A project that implements the recommendations of a conservation plan, site-specific water quality remediation plan, TMDL or modified 208 water quality management plan, which has been approved by an agency of competent jurisdiction, in a sub-watershed where discharge or runoff from nonpoint sources are identified as causing, or significantly contributing to water quality degradation shall receive an additional five (5) points.

3. **Water Quality Protection Factor**. The Water Quality Protection Factor provides a maximum of ten (10) priority points to proposed water quality projects that provide maintenance of beneficial uses and protection for water bodies afforded special protection under OWQS. Projects shall receive ten (10) points for satisfying the following criteria:

   a. A water quality project located within the watershed of a stream segment or in a groundwater basin underlying a watershed of a stream segment (known as "Special Source" groundwater):

      (i) listed in OWQS Appendix A. as an Outstanding Resources Water, High Quality Water, Sensitive Water Supply, Scenic River or Culturally Significant Water;

      (ii) listed in OWQS Appendix B.--"Areas with Waters of Recreational and/or Ecological Significance"; or

      (iii) located in a delineated "source water protection area"; or

   b. A water quality project located in an area overlying a groundwater classified in OWQS with a vulnerability level of Very High, High, Moderate, or Nutrient Vulnerable.

4. **Programmatic Priority Factor.** The Programmatic Priority Factor provides a maximum of one hundred (100) priority bonus points to projects that address specific programmatic priority set for the by the Environmental Protection Agency or Board and detailed in the Annual Intended Use Plan

5. **Readiness to Proceed Factor**. The Readiness to Proceed Factor provides a maximum of four hundred (400) points depending on the relative "readiness to proceed" with a loan commitment among proposed projects.

   a. A project requesting to be considered for funding within the five-year planning period shall receive one hundred (100) points.

   b. In addition to a request for funding, a project for which preliminary planning documents have been submitted shall receive two hundred (200) points. Preliminary planning documents include a preliminary engineering report and a preliminary environmental information document, and must be submitted to the Board and to DEQ or the Conservation Commission as appropriate.

   c. In addition to a request for funding and preliminary planning documents, a project for which a completed loan application has been submitted shall receive three hundred (300) points.

   d. In addition to a request for funding, preliminary planning documents, and a completed loan application, a project for which the appropriate technical plans and specifications necessary to implement the project have been approved by DEQ or the Conservation Commission, as appropriate, shall receive four hundred (400) points.

PROJECT PRIORITY LIST

Projects reviewed according to the Integrated Priority Ranking System will be included on the Project Priority List of the Intended Use Plan. The Priority List of projects will include the following items:

- Name of the recipient
- Facility description
- Project treatment/use categories
- Treatment requirements
- Terms of financial assistance
- Type of Assistance
- NPDES Permit Number
- Projects that require an EIS.
- Projected Assistance Amount
- Disadvantaged Community Status
- Green Project Reserve (as applicable)

FUNDABLE PORTION PROJECT PRIORITY LIST

The fundable portion includes projects scheduled for financial assistance during the first year of the planning period, and which are within the limits of currently available funds.

PLANNING PORTION OF THE PROJECT PRIORITY LIST

That portion of the priority list containing all of those projects outside the fundable portion of the list, and which are anticipated to receive financial assistance in future fiscal years. The planning portion will also include contingency projects which are scheduled for assistance during the first year of the planning period, but for which adequate funds are not available to provide financial assistance during that first year. Contingency projects may receive assistance due to bypass provisions or due to additional funds becoming available.

PUBLIC PARTICIPATION

Before the OWRB adopts its annual CWSRF Intended Use Plan and Project Priority List, the OWRB shall ensure that adequate public participation has taken place. A public meeting will be held to discuss the CWSRF Project Priority List and any revisions that were made to the CWSRF Project Priority System. The notice of public meeting shall precede the public meeting by 30 days and shall be published in a statewide publication. At this time, the OWRB shall circulate information about the Project Priority List including a description of each proposed project. Attendees of the public meeting will be allowed to express their views concerning the list and system.

A CWSRF Project Priority List shall become effective and supersede all previous lists upon the beginning of the federal fiscal year for which it is designated.

MANAGEMENT OF THE INTENDED USE PLAN AND PROJECT PRIORITY LIST

TIE BREAKING PROCEDURE

A tie breaking procedure shall be utilized when two or more projects have equal points under the Project Priority System and are in competition for funds. Projects will be ranked according to existing population. According to the most recent Water Quality Management Plan, i.e., the project with the greatest existing population will receive the higher ranking.

PROJECT BYPASS

A project on the fundable portion of the list may be bypassed if it is determined that the project will not be ready to proceed during the funding year. This determination will be made on projects that are unable to meet the schedule established on the priority list. The applicant whose project is affected shall be given written notices that the project is to be bypassed. Projects that have been bypassed may be reinstated on the funded portion of the list if the following conditions are met:

- Sufficient funds are available, and
- The project completes the necessary tasks to proceed.

Funds which become available due to the utilization of these bypass procedures will be treated in the same manner as additional allotments.

PROJECT PRIORITY LIST UPDATE

The priority list is continually reviewed and changes (i.e., loan award dates, estimated construction assistance amounts, project bypass, addition of new projects, etc.) may occur as necessary and can be found on OWRB's website at www.owrb.ok.gov.

ADDITIONAL ALLOTMENTS

After defining the fundable portion of the CWSRF Project Priority List, the Board may determine that it is necessary or desirable to obligate additional funds that are available and the list may be extended to include the next highest ranked project or projects on the contingency section of the planning portion of the list. Any sum made available to a state by reallotment or de-obligation shall be treated in the same manner as the most recent allotment.

PROJECT REMOVAL

The Board may remove a project from the CWSRF Project Priority List when (1) the project has been funded, (2) the project is found to be ineligible, (3) it is indicated that the applicant does not intend to continue in the State Revolving Loan Program, or (4) the Board has determined that the applicant does not have financial capability to construct the project.

AMOUNT OF FINANCIAL ASSISTANCE

The amount of financial assistance shall be the sum of the total eligible costs related to construction. The amount is contingent upon the availability of funds for this purpose. During each funding year, loans totaling 25% of the funds available from the capitalization grant and state match for that year shall be provided to those eligible small municipalities with a population of 10,000 or less. Until the last federal CAP grant is awarded, if the state has not met the federal requirement of making binding commitments in an amount equal to 120% of each quarterly grant payment within one year of receipt of each quarterly payment, other eligible applicants may apply for a loan or an increase to an existing loan to utilize the small community set aside. This can occur if such actions will permit the state to comply with the federal binding commitment requirement.

ANNUAL CWSRF REPORT

The CWSRF Annual Report is prepared and made available at www.owrb.ok.gov to meet the following programmatic and legislative requirements:

EPA ANNUAL REPORT

As required by Section 602(b)(10) of the Act, the Board will submit Annual Reports to the Regional Administrator no later than 90 days after the end of the fiscal year. The report shall provide information as specified by EPA and shall identify assistance recipients, assistance amounts, assistance terms, project categories and other details as negotiated between the Board and EPA with the emphasis on how the State met the goals set forth in the IUP and stability of the CWSRF.

ANNUAL REPORT TO THE LEGISLATURE AND GOVERNOR

Submission of a joint report by the Board to the Governor, Speaker of the House of Representatives and the President Pro Tempore of the Senate within one hundred twenty (120) days of the end of each fiscal year concerning the Wastewater Facility Construction Revolving Loan Account and implementation of the provisions of this act.

PLACEMENT OF PROJECTS ON THE INTENDED USE PLAN AND FUNDABLE PORTION OF THE CWSRF PROJECT PRIORITY LIST

Prior to projects being considered for placement on the fundable portion of the CWSRF Project Priority List, the applicant must submit a request for such placement and a CWSRF Pre-Application Priority List Questionnaire to the Board. The request must specify that the applicant intends to apply for financial assistance from the CWSRF and a schedule including, but not limited to, the submittal and completion of the following: Infiltration/Inflow analysis, SSES (if required), revenue program, planning documents, plans and specifications, and application for construction assistance. The estimated construction start and initiation of operation of the project should be included.

ADDITION OF NEW PROJECTS TO THE CWSRF PROJECT PRIORITY LIST

Requests for placement on the CWSRF will be accepted throughout the year and loans can be made to eligible entities as funds are available for the funding year. All projects requesting financial assistance must fit into at least one of the categories of need. If a project consists of more than one category, its project ranking calculation will be based on that category which will result in the greatest priority points.

PREPLANNING CONFERENCE

Potential applicants shall confer with the Board staff as early in its planning process as practical. During the conference the Board will provide information, advice, instruction, and guidance on the scope of work and level of effort needed to define eligible projects in order to ensure that the applicant expeditiously complies with the environmental and planning requirements dictated by State and Federal Law. Guidance on the scope of the required environmental information and planning requirements will also be given at the conference.

LOAN REVIEW, FUNDING AND APPROVAL PROCESS

(CWSRF Approval Process can be found in the Oklahoma Water Resources Board Rules Oklahoma Administrative Code Title 785, Chapter 50, Subchapter 9. Additional information may be found within the Funding Agency Coordinating Team's Engineering and Environmental Guides and Forms for Water and Wastewater Projects at http://www.owrb.ok.gov/financing/fact_forms.php.)

PRE-APPLICATION CONFERENCE

An applicant seeking financial assistance from the CWSRF may make an appointment with the Board for a pre-application conference. As a minimum, the pre-application conference should be attended by a member of the governing body of the political subdivision, the entity's engineer, and fiscal representative. If possible the applicant should bring information documenting the existence of a dedicated source of revenue for repaying the loan. The primary purpose of the meeting is to acquaint the applicant with program requirements and to assist the applicant in preparing an application.

PLANNING DOCUMENTS

The purpose of the planning document is to present the findings in a precise fashion with enough attention given to detail so as to allow adequate review of the project by the owner and applicable regulatory agencies. The plan will allow the review of the alternatives from the viewpoints of function, operation, economics, reliability, safety, efficiency, cost-effectiveness and environmental compatibility.

The planning document should be must be submitted to the OWRB electronically. The document shall contain but not be limited to the following information:

- Identification of the planning area boundaries and characteristics, the existing problems and needs related to wastewater management, and the projected needs and problems for the next 20 or more years.
- Cost-effective analysis of feasible wastewater treatment or conveyance alternatives capable of meeting State and federal water quality and public health requirements. The cost effective analysis shall detail all monetary costs including but not limited to the present worth or equivalent annual value of all capital costs and operation.
- All basic information necessary for the design of the sewage system and/or treatment works.
- A Revenue Program, including a draft user charge system that complies with Boards guidelines.
- Green component checklist
- Resolution passed by the applicant, which accepts the planning documents and provides a commitment to build the proposed project.
- Proposed project must be consistent with the State's approved Water Quality Management Plan established by Section 208 of the Act.

- Fiscal Data. The applicant shall submit a statement of the project engineer's most current estimate of project cost itemized as to major facilities or items including land and right-of-way costs, fees of engineers, all legal fees, fees of financial advisors and/or consultants, contingencies (5%), and interest during construction.

Planning documents, when necessary, will contain a Sludge Management Plan consistent with DEQ sludge management regulations.

A Sludge Management Plan will be submitted with the planning document if the proposed project includes any construction, modification, or upgrade of a sewage treatment plant. The Sludge Management Plan will address sludge produced by the treatment plant after initiation of operation and will comply with applicable rules of DEQ in OAC 252:606. If the construction necessitates the disposal of inventoried sludge, the Sludge Management Plan will also address existing sludge.

The Sludge Management Plan will address the following minimum information requirements, and must otherwise comply with the requirements of OAC 252:606:

- Quantity to be disposed of in dry tons per year
- Method of stabilization
- Method of disposal,
- A chemical analysis of the sludge
- Legal description of the area used for ultimate disposal of the sludge.

ENVIRONMENTAL REVIEW PROCESS

As required by the provisions of Section 602(b) (6) of the 1987 Amendments to the Clean Water Act, the Board shall conduct an interdisciplinary environmental review consistent with the National Environmental Policy Act of the project proposed for funding through the Clean Water State Revolving Fund Account. This review will insure that the project will comply with the applicable local, state and federal laws and Board regulations relating to the protection and enhancement of the environment. Based upon the staff's review, the Board will make formal determinations regarding the potential social and environmental impacts of the proposed project.

There are three (3) basic environmental determinations that will apply to projects proposed to be implemented with assistance from the Wastewater Facility Construction Revolving Loan Account. These are: a determination to categorically exclude a project from a formal environmental review; a finding of no significant impact (FNSI) based upon a formal environmental review supported by an environmental information document (EID); and a determination to provide or not to provide financial assistance based upon a Record of Decision following the preparation of an environmental impact statement (EIS).

As necessary, the determination will include mitigative provisions as a condition of financial assistance for building and no financial assistance will be provided until a final environmental determination has been made. Nothing in the Board's regulations shall prohibit any public, private or governmental party from seeking administrative or legal relief from the determinations of the Board. Potential applicants to the should obtain guidance from the staff regarding the scope of the environmental review to be conducted by the Board and the environmental information which the applicant will be required to submit in support of the proposed project.

PLANS AND SPECIFICATIONS

Submittals. The applicant shall prepare plans and specifications and a final engineering design report on all significant elements of the project. These documents shall conform to the Water Pollution Control Facility Standards, contained in Department rules in OAC 252. Two copies of the documents shall be submitted to the Board.

Additional requirements. The plans and specifications shall contain the following:

- Provisions assuring compliance with the Board's rules and regulations and the Oklahoma bidding laws.
- Forms by which the bid bond, statutory, performance and maintenance bonds will be provided.
- Bonding requirements outlined in 61 OS2006, Section 113(B), as amended.
- CWSRF program specific bid and contract document requirements

Provisions requiring the contractor to obtain and maintain the appropriate insurance coverage.

Provisions giving authorized representatives of the Board access to all such construction activities, books, records, documents, and other evidence of the contractor for the purpose of inspection, audit and copying during normal business hours.

Those conditions, specifications, and other provisions provided by or requested by the Board to comply with State law and the CWSRF regulations.

Bid proposal that separates eligible construction from ineligible construction.

APPROVAL OF PLANS AND SPECIFICATIONS

The Board will approve the plans and specifications if they:

- Conform to the requirements the CWSRF regulations and have a permit to construct issued by DEQ.
- Are consistent with all relevant statutes.
- Pass a bid-ability, operability, and constructability review by the Board.
- Are consistent with Board's approved planning documents and environmental determinations.

Approval of the plans and specifications does not relieve the applicant of any liabilities or responsibilities with respect to the design, construction, operation, or performance of the project.

The applicant shall obtain authorization from the Board before advertising for bids on the project.

APPLICATION FOR FINANCIAL ASSISTANCE

Two copies of an application shall be filed with the Board. The information required on all applications for financial assistance must meet the requirements of the Board presented to the applicant at the pre-application conference and must be on the fundable portion of the State priority list and included on the current year Intended Use Plan.

A copy of the proposed Revenue Program including draft user charge system may be submitted with the application.

BINDING COMMITMENT

Upon approval of the planning and environmental documents by DEQ and Board, and approval of the application by the Board, the Board will issue a letter of binding commitment. This will be a commitment of financial assistance and shall contain those conditions deemed necessary by the Board.

LOAN CLOSING

Prior to loan closing the applicant will submit to the Board, two copies of the following bid and contract documents:

- Bid documents, including all addenda.
- A tabulation of all bids received and an explanation for any rejected bids or otherwise disqualified bidders.
- Contingently executed construction contract to be entered into by the applicant for building of the projects containing the appropriately executed bonds, insurance certificates, act of assurance, and other documents required by this chapter.
- Other or additional engineering data and information, if deemed necessary by the Board staff.
- A certification that all required acquisitions, leases, easements, rights-of-way, relocations, (both voluntary and involuntary) have been obtained for the project to be built.
- Evidence that the applicant has obtained all required permits and financing to build the wastewater facilities.

- Information requested by the Board regarding loan closing documents.
- Prior to concurrence by the Board in the award of a construction contract, any and all bid protests must be resolved by the applicant.

REFINANCING CONSTRUCTION LOANS

If the project includes the refinancing of a loan, the applicant shall submit all of the items specified and any records, assurances, or appraisals concerning the construction of the project. Additionally, the project must pass Board inspection verifying that the facility was constructed in accordance with the approved plans and specifications.

MINIMUM ASSISTANCE AGREEMENT CONDITIONS

The Board will furnish a list of conditions to be included in the assistance agreement. To include as a minimum:

- Any condition identified in the letter of commitment that applies to the loan.
- Federal requirements mandated by the Clean Water Act.
- All applicable federal laws and orders
- A project schedule that has been coordinated with State and Federal enforcement authorities.
- Any Federal, State or local requirement previously identified that has a significant impact on the project.
- Conditions and mitigative measures identified during the environmental review.

CONSTRUCTION PHASE

AWARDING CONSTRUCTION CONTRACTS

The recipient shall be responsible for assuring that every appropriate procedure and incidental legal requirement is observed in advertising for bids and awarding the construction contract. The text of the construction contract shall not vary from the text of the Board approved draft contract documents in the approved plans and specifications or addenda to the plans and specifications.

INSPECTION DURING CONSTRUCTION

During the building phase of the project, the recipient shall provide engineering services necessary to assure completion of the project in accordance with the loan agreement and the approved plans and specifications.

RESIDENT INSPECTION

After the construction contract is awarded, the recipient shall provide for adequate full-time resident inspection of the project and require assurance that the work is being performed in a satisfactory manner in accordance with the approved plans and specifications, approved alterations, sound engineering principles and building practices. The Board is authorized to inspect the building of any project at any time in order to assure that plans and specifications are being followed and that the works are being built in accordance with sound engineering principles and building practices, but such inspection shall never subject the State of Oklahoma to any action for damages. The Board shall bring to the attention of the recipient and the project engineer any variances from the approved plans and specifications. The recipient and the project engineer shall immediately initiate necessary action rectifying construction deficiencies.

INSPECTION OF MATERIALS

- The Board is also authorized to inspect all materials furnished, including inspection of the preparation or manufacture of the materials to be used. The State inspector is to report the manner and progress of the building or to report conditions relating to the materials furnished and the compliance by the contractor with approved plans and specifications for the project. Such inspection will not release the contractor from any obligation to perform the work in accordance with the requirements of the contract documents or the project engineer from determining compliance with the requirements of the contract documents.

- In the event building procedures or materials are determined by the Board to be substandard or otherwise unsatisfactory and/or not in conformity with approved plans and specifications, the Board may order the recipient to take such action in the manner provided for in the construction contract to correct any such deficiency.
- In those instances of dispute between the recipient project engineer and the Board's representative as to whether material furnished or work performed conforms with the terms of the construction contract, the Board may order the recipient to direct the project engineer to reject questionable materials and/or initiate other action provided for in the construction contract, including suspension where necessary, until all disputed issues are resolved in accordance with the terms of the construction contract.
- The contractor and recipient shall furnish the Board's representative with every reasonable facility for ascertaining whether the work as performed is in accordance with the requirements and intent of the contract.
- In addition to normal testing procedures required of the recipient, the Board may require reasonable additional tests of building materials which the Board determines to be necessary during the building of projects financed in whole or in part by CWSRF funds. All tests, whether for the Board or the project engineer, will conform to current American Water Works Association, American Association of State Highway and Transportation Officials, American Society of Testing and Materials, and the Oklahoma Department of Transportation published procedures, or similar criteria. The Board shall specify which tests are applicable. Samples for testing shall be furnished at no cost to the Board upon request on the construction site.

PROJECT CHANGES

Minor changes in the project work that are consistent with the objectives of the project and within the scope of the assistance agreement do not require the approval of the Board before the applicant's implementation of the change. However, the amount of the funding provided by the assistance agreement may only be increased by a formal amendment which will require Board approval.

The recipient must receive approval from the Board before implementing changes which:

- Alter the project performance standards.
- Alter the type of wastewater treatment provided by the project.
- Significantly delay or accelerate the project schedule.
- Substantially alter the design drawings and specifications, or the location, size, capacity, or quality of any major part of the project.

A change of scope, such as the addition of new construction items, will not be eligible after loan closing unless:

- The change of scope is necessary to result in an operable treatment works due to an oversight and not to replace faulty construction or equipment already funded, or
- The change of scope is necessary due to changes in Federal or State requirements

BUILDING PHASE SUBMITTALS

The following submittals and accompanying actions by the recipient will be required during the building phase of the project.

- A complete set of as-built drawings will be submitted to DEQ upon completion of all construction.
- Notice of completion of construction will be submitted to the Board upon completion of project construction.
- Any other building phase submittals required as part of the financial assistance documents will be submitted for the Board's approval.

PROGRESS PAYMENTS

Disbursements from the construction fund established by the recipient will require approval by the Board. Certified requests for payment and documentation shall be submitted to the Boardas necessary. Upon approval by the Board who will authorize the progress payments to be made from the fund.

RETAINAGE

Retainage withheld. Five percent (5%) of all partial payments made may be withheld as retainage.

Final release after completion of construction and acceptance by the applicant, the final release of retainage may be made with approval of the project by the Board.

POST BUILDING PHASE RESPONSIBILITIES OF THE RECIPIENT

After the satisfactory completion of the project, the recipient shall be held accountable by the Board for the continued validity of all representations and assurances made to Board. Continuing cooperation with the Board is required. To facilitate such cooperation and to enable the Board to protect the State's investment and public interest, the following provisions shall be observed:

The Board is authorized to inspect the project and the records of operation and maintenance of the project at any time. If it is found that the project is being improperly or inadequately operated and maintained to the extent that the project objectives are not being properly fulfilled or that integrity of the State's investment is being endangered, the Board shall require the recipients to take appropriate action.

The Board may request certified copies of all minutes, operating budgets, monthly operating statements, contracts, leases, deeds, audit reports, and other documents concerning the operation and maintenance of the project in addition to the requirements of the covenants of applicable bond indenture and/or the loan agreement. The financial assistance provided by the Board is based on the project's economic feasibility, and the Board shares the recipient's desire to maintain this feasibility in the project's operation and maintenance at all times. The Board may periodically inspect, analyze, and monitor the project's revenues, operation, and any other information the Board requires in order to perform its duties and to protect the public interest.

The recipient shall maintain debt service fund accounts and all other fund accounts related to the CWSRF debt in accordance with standards set forth by the Governmental Accounting Standards and the Board.

Recipients, who were required to implement mitigative measures as a result of the environmental review process, shall continue to comply with those measures.

- Payment of principal and interest on loans shall be made to the Board as provided in the loan documents.

ACCOUNTING RESPONSIBILITIES OF THE RECIPIENT

The recipient shall submit with the application an adopted ordinance, resolution or similar instrument that shall contain sections providing:

That project accounts for the construction fund shall be maintained in accordance with standards set forth by the Governmental Accounting Standards and the Board. The construction fund shall be established at an official depository of the recipient and all funds in the construction fund shall be secured in the manner provided by law for the security of county funds or city funds, as appropriate. All proceeds acquired by the recipient to plan, design and construct the project shall be placed in the construction fund. All proceeds in the construction fund shall be used for the sole purpose of planning, design and building the project as approved by the Board.

Upon completion of the project a final accounting will be made to the Board. The final accounting shall provide:

- A final accounting shall be made to the Board of the total cost of the project upon completion of the project. Such resolution or ordinance shall also provide that if the project be completed at a total cost less than the amount of available funds for building the project, or if the Board disapproves construction of any portion of the project as not being in accordance with the plans and specifications, the recipient shall immediately, with filing the final accounting, return to the CWSRF the amount of any such excess and/or the cost as determined by the Board relating to the parts of the project not built in accordance with the plans and specifications, to the nearest multiple of $1,000, or to the nearest denomination of bonds being sold (where funding was provided by bonds issued by the Board).
- That an annual audit of the recipient, prepared by a certified public accountant or licensed public accountant be provided to the Board.
- That the recipient shall maintain adequate insurance coverage on the project in an amount adequate to protect the State's interest.
- That the recipient will comply with any special conditions specified by the Board's environmental determination until all financial obligations to the State have been discharged.
- That the recipient covenants to continually abide by the terms of the financial assistance agreement, the Board's rules and regulations, and relevant State statutes for operation and maintenance of the facility.