

Utah Antidegradation Review Implementation Guidance

Version 2.0

2/6/2015

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This draft has not been approved by DWQ management

DOCUMENT VERSIONS

<u>Version</u>	<u>Date</u>	<u>Summary of Changes</u>
1.0	May 2010	Original document issued.
1.1	May 2012	<ul style="list-style-type: none"> • Minor revisions to original document including some formatting and reorganization. • Added procedures for ranking and weighting POCs.
2.0	TBD	<ul style="list-style-type: none"> • Added procedures for identifying POCs for discharges to fresh and salt water terminal lakes, and the Great Salt Lake. • Revised flow chart to clarify the submittal and review process (Figure 2). • Revised procedures for ranking and weighting POCs; added assimilative capacity as a factor to consider. Added an example of detailed quantitative procedures for ranking and weighting POCs (Appendix A). • Added requirement that Alternatives Analysis be stamped by a Professional Engineer. • Added procedures for establishing the Baseline Treatment Alternative. • Revised procedures for selecting the least degrading feasible alternative (“preferred alternative”), including consideration of degradation, total cost, cost effectiveness, affordability and other factors. Added an example of detailed quantitative procedures for ranking alternatives (Appendix A). • Developed supplemental spreadsheet tools for ranking and weighting POCs and alternatives. • Added procedures for General Permits. • Added procedures for 401 Water Quality Certifications. • Added Glossary. • Added List of Acronyms. • Added References.

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1 **GLOSSARY**

2 **ambient condition:** water quality of the receiving water immediately upstream of the point of
3 discharge

4 **assimilative capacity:** the natural capacity of a water body to dilute and absorb pollutants and
5 prevent harmful effects (e.g., damage to public health or physical, chemical, biological integrity
6 of the water)**baseline alternative:** the treatment alternative that meets water quality standards
7 and water quality based permit effluent limits established by the wasteload analysis

8 **beneficial use:** use of waterbody, including protection and propagation of aquatic wildlife,
9 recreation, public water supply, and agricultural supply

10 **Blue Ribbon Fishery:** status administered by the Utah Division of Wildlife Resources and the
11 Blue Ribbon Advisory Council that indicates the waterbody has high quality in the following
12 attributes: fishing, outdoor experience, fish habitat, and economic benefits

13 **designated use:** beneficial use of waterbody as specified in UAC R317-2-13.

14 **existing use:** beneficial use actually attained in a waterbody on or after November 28, 1975
15 (UAC R317-1), or use that would be supported by the water quality, regardless of whether or not
16 they are designated in the water quality standards.

17 **parameter of concern:** a pollutant in the discharge that exceeds or is anticipated to exceed the
18 ambient concentration in the receiving water

19 **reasonable potential analysis:** statistical analysis to determine whether effluent will have the
20 reasonable potential to cause an excursion above State water quality standards

21 **sustainability:** the degree that the management method minimizes the depletion or damage to
22 natural resources

23 **toxic weighting factor:** method to normalize pollutants for differences in toxicity in order to
24 provide the means to compare mass loadings of different pollutants. EPA derives toxic weighting
25 factors from chronic aquatic life criteria (or toxic effect levels) and human health criteria (or
26 toxic effect levels) established for the consumption of fish.

27 **waters of the State of Utah:** all streams, lakes, ponds, marshes, water-courses, waterways,
28 wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of
29 water, surface and underground, natural or artificial, public or private, which are contained
30 within, flow through, or border upon this state or any portion thereof, except that bodies of
31 water confined to and retained within the limits of private property, and which do not develop
32 into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall
33 not be considered to be "waters of the state" under this definition (Section 19-5-102)

34 **Waters of the United States:** waterbodies subject to the provisions of the Clean Water Act.
35 Specific waters included under this definition are based on federal agencies' interpretation of
36 the statute, implementing regulations and relevant caselaw. Refer to EPA for latest guidance on
37 determination of waters of the US.

ACRONYMS

ADR	antidegradation review
AFO	animal feeding operation
BMP	best management practice
BPT	best practicable technology
BU	Beneficial use
CAFO	concentrated animal feeding operation
DEQ	Utah Department of Environmental Quality
DMR	discharge monitoring report
DWQ	Utah Division of Water Quality
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
NOI	Notice of Intent
NPV	net present value
POC	parameter of concern
POTW	publically owned treatment works such as water reclamation facilities
SEEI	social, economic and environmental importance
SOP	standard operating procedures
TWF	toxic weighting factor
TWPE	toxic weighting pound equivalents
UAC	Utah Administrative Code
UPDES	Utah Pollution Discharge Elimination System
USACE	United States Army Corp of Engineers
WET	whole effluent toxicity
WLA	wasteload analysis
WQBEL	water quality based effluent limit

40 **1.0 INTRODUCTION**

41 The central goals of the Clean Water Act and the Utah Water Quality Act are to
42 protect, maintain, and restore the quality of Utah’s waters. One way in which this is
43 accomplished is through Utah’s water quality standards, which consist of: 1) designated
44 uses (e.g., aquatic life, drinking water, recreation), 2) water quality criteria (both
45 numeric and narrative), and 3) antidegradation policy and procedures. The intent of the
46 antidegradation component of our standards is to protect existing in-stream uses and to
47 maintain high quality waters; those waters that are in better condition than the water
48 quality standards require. Utah’s antidegradation policy (UAC R317-2-3) provides a
49 decision making process to ensure that when degradation of water quality is necessary
50 to accommodate important social and economic development, every feasible option to
51 minimize degradation is explored. Also, the policy requires that alternative
52 management options and the environmental and socioeconomic benefits of proposed
53 projects are made available to concerned stakeholders.

54 This document provides the implementation procedures for Utah’s antidegradation
55 rules. Utah’s Division of Water Quality (hereafter DWQ) is required by Federal Code (40
56 CFR §131.12(a)) to develop an antidegradation policy and implementation procedures.
57 These procedures and associated rules (UAC R317-2-3) meet these requirements. The
58 implementation procedures discussed in this document were developed in a
59 collaborative process among stakeholders to identify procedures that would meet the
60 intent of antidegradation rules, while avoiding unnecessary regulatory burdens.

61 This is the third version of the guidance document. A history of versions and
62 modifications made to the guidance document can be found in Appendix C. Section 8.0
63 summarizes the portions of the guidance that still need to be completed.. The absence
64 of guidance for these topics does not negate or delay the requirements for
65 antidegradation reviews required under UAC R317-2-3.

66 **1.1 Antidegradation Goals and Objectives**

67 The overarching goal of ADRs is summarized in rule R317.2.3.1 as follows:

68 *“Waters whose existing quality is better than the established standards for the designated*
69 *uses will be maintained at high quality unless it is determined by the Board, after*
70 *appropriate intergovernmental coordination and public participation in concert with the*
71 *Utah continuing planning process, allowing lower water quality is necessary to*
72 *accommodate important economic or social development in the area in which the waters are*
73 *located. However, existing instream water uses shall be maintained and protected. No water*
74 *quality degradation is allowable which would interfere with or become injurious to existing*
75 *instream water uses.”*

76 Antidegradation reviews (ADRs) are required, as part of the permitting process, for
77 any action that has the potential to degrade water quality. Activities subject to ADRs
78 include any activities that require a permit or water quality certification pursuant to
79 federal law. The ADR process involves: 1) classification of surface waters into protection

80 categories, and 2) documenting that activities likely to degrade water quality are
81 necessary and that all State and Federal procedures have been followed to ensure that
82 reasonable steps are taken to minimize degradation.

83

84 **2.0 ANTIDegradation Protection Categories**

85 **2.1 Assigning Protection Categories**

86 Utah’s surface waters are assigned to one of three protection categories that are
87 determined by their existing biological, chemical and physical integrity, and by the
88 interest of stakeholders in protecting current conditions. Antidegradation procedures
89 are differentially applied to each of these protection categories on a parameter-by-
90 parameter basis.

91 *2.1.1 Category 1 Waters*

92 Category 1 waters (as listed in R317-2-12.1) are afforded the highest level of
93 protection from activities that are likely to degrade water quality. This category is
94 reserved for waters of exceptional recreational or ecological significance, or that have
95 other qualities that warrant exceptional protection. Once a waterbody is assigned
96 Category 1 protection, future discharges of wastewater into these waters are not
97 permitted. However, permits may be granted for other activities (e.g., road
98 construction, dam maintenance, pesticide/herbicide application) if it can be shown that
99 water quality effects will be temporary and that all appropriate Best Management
100 Practices (BMPs) have been implemented to minimize degradation of these waters.
101 Discharges that were permitted prior to February 1994, when the rule establishing
102 Category 1 waters was promulgated, are considered grandfathered.

103 *2.1.2 Category 2 Waters*

104 Category 2 waters (as listed in R317-2-12.2) are also afforded a high level of
105 protection, but discharges to these waters are permissible, provided no degradation of
106 water quality will occur or where pollution will result only during the actual construction
107 activity and where BMPs will be employed to minimize pollution effects. In practice, this
108 means that all wastewater parameters should be at or below background
109 concentrations of the receiving water for activities that are not temporary and limited.
110 As a result of this stipulation, the Level I and Level II ADR provisions discussed in these
111 implementation procedures are not required for Category 2 waters.

112 *2.1.3 Category 3 Waters*

113 All surface waters of the State are Category 3 waters unless otherwise designated as
114 Category 1 or 2 in UAC R317-2-12. Discharges that degrade water quality are permitted
115 for Category 3 waters provided that 1) existing uses are protected, 2) the degradation is
116 necessary, 3) the activity supports important social or economic development in the
117 area where the waters are located, and 4) all statutory and regulatory requirements are
118 met in the area of the discharge. Antidegradation rules also apply for any proposed new
119 or expanded discharge that is likely to degrade water quality. ADRs require that these
120 proposed actions demonstrate that such proposed projects are necessary to
121 accommodate social and economic development, and that all reasonable alternatives to
122 minimize degradation of water quality have been explored. These implementation

123 procedures provide details about how ADRs are implemented to meet these
124 requirements.

125 **2.2 Procedures for Reassigning Protection Categories**

126 The intent of Category 1 and Category 2 protection classes is to protect high quality
127 waters. Any person, entity, or DWQ may nominate a surface water to be afforded
128 Category 1 or 2 protections by submitting a request to the Director of the DWQ DWQ
129 generally considers nominations during the triennial review of surface water quality
130 standards. The nominating party has the burden of establishing the basis for
131 reclassification of surface waters, although DWQ may assist, where feasible, with data
132 collection and compilation activities.

133 *2.2.1 Material to Include with a Reclassification Nomination*

134 The nomination may include a map and description of the surface water; a statement
135 in support of the nomination, including specific reference to the applicable criteria for
136 unique water classification, and available, relevant and recent water quality or biological
137 data. All data should meet the minimum quality assurance requirements used by DWQ
138 for assessing waters of the State, per the requirements in *Utah Division of Water
139 Quality: Quality Assurance Program Plan for Environmental Data Operations* (DWQ,
140 2014) and associated Standard Operating Procedures (SOP).

141 It is strongly recommended that a petition for reclassification have the support of the
142 local water quality planning authority and watershed advisory group.

143 *2.2.2 Factors Considered to Increase Protection of Surface Waters*

144 The Water Quality Board may reclassify a waterbody to a more protected category,
145 following appropriate public comment. Evidence provided to substantiate any of the
146 following justifications that a waterbody warrants greater protection may be used to
147 evaluate the request:

- 148 • The location of the surface water with respect to protections already afforded to
149 waters (e.g. on federal lands such as national parks or national wildlife refuges).
- 150 • The ecological value of the surface water (e.g., biological diversity, or the
151 presence of threatened, endangered, or endemic species).
- 152 • Water quality superior to other similar waters in surrounding locales.
- 153 • The surface water is of exceptional recreational or ecological significance
154 because of its unique attributes (e.g., Blue Ribbon Fishery).
- 155 • The surface water is highly aesthetic or important for recreation and tourism.
- 156 • The surface water has significant archeological, cultural, or scientific importance.
- 157 • The surface water provides a special educational opportunity.

- 158 • Any other factors the Board considers relevant as demonstrating the surface
159 water’s value as a resource.

160 The final reclassification decision will be based on all relevant information submitted
161 to or developed by DWQ.

162 2.2.3 *Factors Considered to Decrease Protection of Surface Waters*

163 The intent of Category 1 and Category 2 protections is to prevent future degradation
164 of water quality. As a result, downgrades to surface water protection categories are
165 rare. However, exceptional circumstances may exist where downgrades may be
166 permitted to accommodate a particular project. For instance, in Utah most surface
167 waters in the upper portions of National Forests are afforded Category 1 protection,
168 which may not be appropriate in specific circumstances. Project proponents may
169 request a classification with lower protection; however, it is their responsibility to
170 provide sufficient justification. Examples of situations where a reclassification with less
171 stringent protections might be appropriate are:

- 172 • Failure to complete the project will result in significant and widespread
173 economic harm.
- 174 • Situations where the surface water was improperly classified as a Category 1 or
175 Category 2 water because the surface water is not a high quality water (as
176 defined by the criteria outlined in 2.2.2).
- 177 • Water quality is more threatened by not permitting a discharge (e.g., septic
178 systems vs. centralized wastewater treatment).

179 Requests for downgrades to protection should provide the most complete and
180 comprehensive rationale that is feasible. The request for a reduction in protection may
181 also be considered in concert with the alternatives evaluated through an accompanying
182 Level II ADR. Proposed projects affecting high quality waters may require more
183 comprehensive analysis than projects affecting lower quality waters.

184 2.2.4 *Public Comment for Proposed Reclassifications*

185 All data and information submitted in support of reclassification will be made part of
186 the public record. In addition to public comment, the DWQ will hold at least one public
187 meeting in the area near the nominated water. If the issues related to reclassification
188 are regional or statewide or of broader public interest, the Division will consider
189 requests for public meetings in other locations. Comments received during this meeting
190 will be compiled and considered along with the information submitted with the
191 nomination.

192 2.2.5 *Reclassification Decision Making Process*

193 The final reclassification decision will be based on all relevant information submitted
194 to or developed by the DWQ. All data will be presented and discussed with the Water
195 Quality Standards Workgroup. DWQ will then submit its recommendations regarding

196 reclassifications to the Water Quality Board who makes a formal decision about
197 whether to proceed with rulemaking to reclassify the waterbody. The proposed
198 reclassification is a rule change, and as such will trigger public notice and comment
199 procedures.

200 **3.0 ANTIDegradation Review General Procedures**

201 **3.1 Overview of Antidegradation Review Procedures**

202 ADR reviews for Category 3 waters are conducted at two levels, which are referenced
203 in R317-2-3 as Level I and Level II reviews. Category 1 and Category 2 waters do not
204 require an Antidegradation Review, as degradation of these waters is not allowed.

205 Level I reviews are intended to ensure that proposed actions will not impair “existing
206 uses”. Level II ADRs assure that degradation is necessary and that the proposed activity
207 is economically and socially important. Level II ADRs are required for any activity that is
208 not temporary and limited in nature and is likely to result in degradation of water
209 quality. The central tenet of these reviews is to ensure that the discharge is necessary,
210 water quality standards will not be violated, and that alternatives to minimize
211 degradation are considered.

212 *3.1.1 Actions Subject to Antidegradation Provisions*

213 Activities subject to ADR requirement include all activities that require a permit or
214 certification under the Clean Water Act. Special considerations for General Permits,
215 §401 Certifications, and Stormwater Permits are provided in Section 7.0.

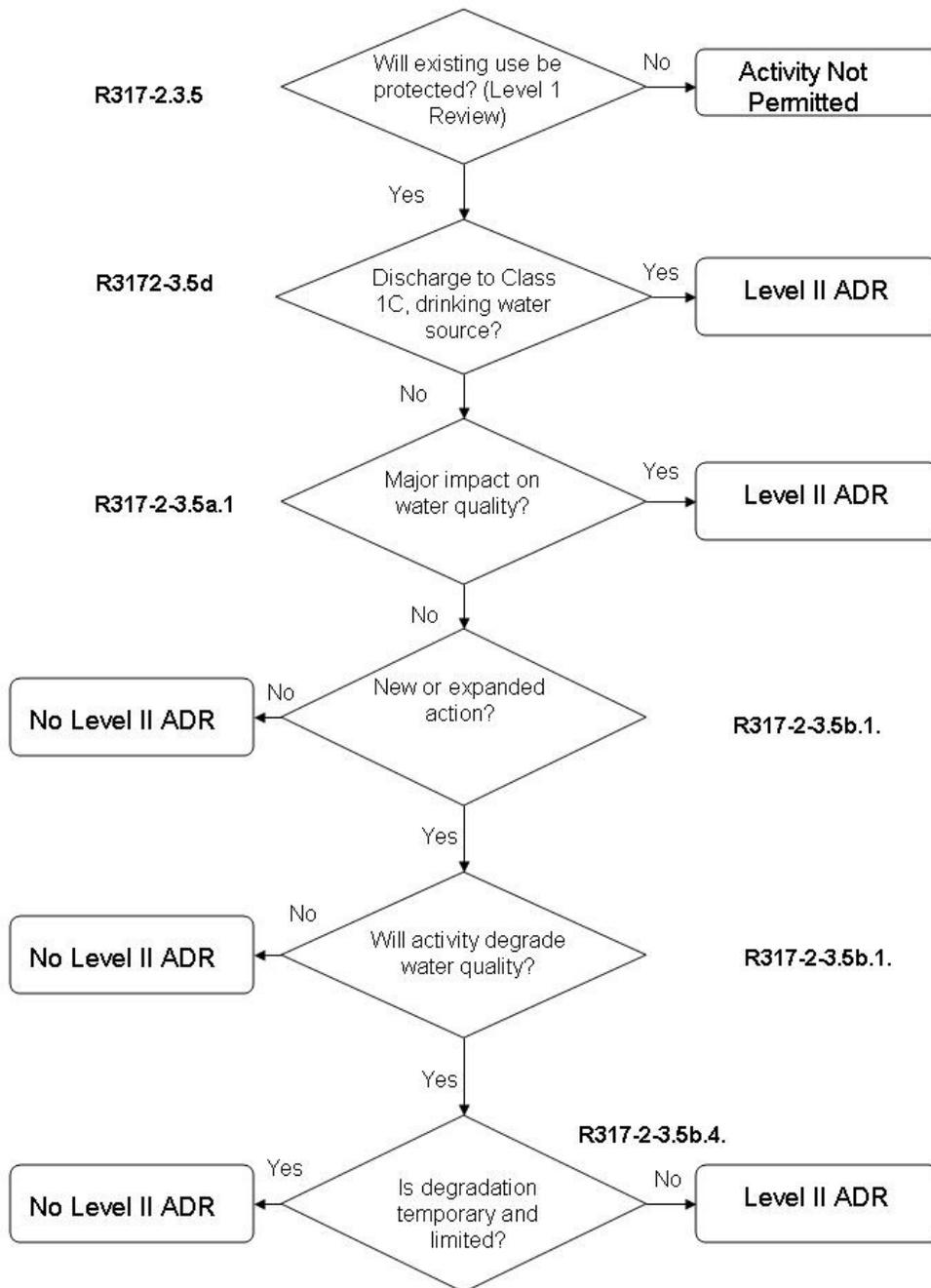
216 **3.2 Level I Antidegradation Reviews**

217 Level I reviews are intended to ensure that “existing uses” will be maintained and
218 protected. Existing uses are defined as any beneficial uses actually attained in a water
219 body on or after November 28, 1975 (UAC R317-1), or uses that would be supported by
220 the water quality, regardless of whether they are included in the water quality
221 standards. For instance, if a stream is currently designated a warm water fishery
222 (Beneficial Use (BU) Class 3B or 3C), yet it supported a trout fishery (BU Class 3A) at
223 some point after 1975, the “existing use” criteria would be those for BU Class 3A
224 (protected for cold water species of game fish and other cold water aquatic life,
225 including the necessary aquatic organisms in their food chain).

226 Neither State nor Federal regulations allow water quality permits to be issued if the
227 proposed project will impair an existing instream use. In order to ensure the protection
228 of existing uses, the Level I review evaluates whether there are existing uses with
229 protection requirements that are more stringent than the currently designated uses
230 (R317-2-13).

231 The permit applicant is responsible for submitting necessary effluent data for DWQ
232 to conduct the Level I ADR.

233



234
235
236

Figure 1. General process for determining whether a Level II ADR is required for a permit.

237 **3.3 Level II Antidegradation Reviews**

238 A Level II ADR is required if the receiving water is designated with a 1C Drinking Water
239 Source Use or the Director determines that the discharge may have a major impact on
240 water quality. Otherwise, all of the following conditions must apply before a Level II
241 ADR is required for a proposed activity: 1) it must be a new or expanded action, 2) it
242 must be an action that is regulated by the DWQ, and 3) the action must have a
243 reasonable likelihood of degrading water quality. Additional details for each of the
244 preceding requirements are provided below. Figure 1 provides a flow chart to assist
245 with determining whether a Level II ADR is required.

246 *3.3.1 Activities Considered New or Expanded Actions*

247 New actions refer to facilities that are being proposed for construction, or actions that
248 are initiated for the first time. Expanded refers to a change in permitted or design
249 concentration or flow and corresponding pollutant loading. Examples of expanded
250 actions include:

- 251 • An increase in permitted concentrations;
- 252 • An increase in permitted flow;

253 New or expanded actions could include increases in discharge concentration resulting
254 from the construction of new or expanded industrial or commercial facilities. In general,
255 Level II ADRs will be conducted for POTWs based on the design basis of the facility, so
256 subsequent Level II reviews would typically only occur during facility planning and
257 design for construction. Periods when treatment systems are being designed,
258 redesigned, or expanded are often ideal opportunities for implementing new
259 technologies or evaluating long-term strategies for pollution control. The intent of this
260 provision is that any POTW capacity expansion would qualify as an action potentially
261 subject to a Level II ADR.

262 A permit authorizes a facility to discharge pollutants without explicit permit limits as
263 long as those pollutants are constituents of waste streams, operations, or processes that
264 were clearly identified during the permit application process, regardless of whether or
265 not they were specifically identified as present in the facility discharges (*see*
266 memorandum from Robert Perciasepe, Assistant Administrator for Water, to Regional
267 Administrators and Regional Counsels, July 1, 1994, at Pages 2-3). These pollutants are
268 generally treated the same as pollutants with explicit permit limits with regards to ADRs,
269 *i.e.*, if a renewing permit maintains the *status quo*, no additional ADR is required.
270 However, the Director can require a Level II ADR for any project, including renewing
271 permits, if the proposed activity could potentially degrade water quality.

272

273 *3.3.2 Activities Not Considered to Result in Degradation or Additional*
274 *Degradation*

275 Level II ADRs are not required for projects that are not likely to result in degradation
276 of the receiving water. Nor are Level II ADRs typically required for projects when the
277 permit is being renewed with no increase in permitted flow or concentrations. Permits
278 that are being renewed met the ADR requirements when the permit was originally
279 issued and are not required to conduct additional ADRs in the absence of an increase in
280 degradation. A regulated discharge activity may not be considered to result in
281 degradation if one or more of the following apply:

- 282 • Water quality will not be further degraded by the proposed activity (R317-2-
283 3.5.b(1)). Examples include:
 - 284 a. The proposed concentration-based effluent limit is less than or equal to
285 the ambient concentration in the receiving water during critical
286 conditions.
 - 287 b. A UPDES permit is being renewed and the proposed effluent
288 concentration and loading limits are equal to or less than the
289 concentration and loading limits in the previous permit.
 - 290 c. A UPDES permit is being renewed and new effluent limits are to be
291 added to the permit, but the new effluent limits are based on
292 maintaining or improving upon effluent concentrations and loads that
293 have been observed, including variability.
- 294 • The activity will result in only temporary and limited degradation of water quality
295 (see Section 3.3.4).
- 296 • Additional treatment is added to an existing discharge and the facility retains
297 their current permit limits and design capacity.
- 298 • The activity is a thermal discharge that has been approved through a Clean
299 Water Act §316(a) demonstration.

300 For some parameters, assimilative capacity is used when concentrations in the
301 discharge are less than ambient concentrations. For instance, if the pH in a discharge is
302 6 and ambient pH is 7, assimilative capacity for pH will be used and pH may be a
303 parameter of concern for a Level II ADR.

304 *3.3.4 Activities Considered Temporary and Limited*

305 A Level II ADR may not be required if the Director determines degradation from a
306 discharge qualifies as temporary and limited following a review of information provided
307 by the applicant (R317-2-3.5b(3) and (4)). The information provided by applicant should
308 include:

- 309 • length of time during which water quality will be lowered;
- 310 • percent change in ambient conditions;

- 311 • pollutants affected;
- 312 • likelihood for long-term water quality benefits to the segment (e.g., as may
- 313 result from dredging of contaminated sediments);
- 314 • whether fish spawning, or survival and development of aquatic fauna will be
- 315 affected (excluding fish removal efforts);
- 316 • degree to which achieving the applicable Water Quality Standards during the
- 317 proposed activity may be at risk; and
- 318 • potential for any residual long-term influences on existing uses.

319 U.S. Fish and Wildlife Service and the Utah Division of Wildlife Resources should be
320 consulted to determine if the timing of the project potentially will affect fish spawning.
321 Clean Water Act Section 402 General Permits, CWA Section 404 Nationwide and General
322 Permits, or activities of short duration and limited impact may be deemed to have
323 temporary and limited effects on water quality. See Section 7.0 for additional detail.

324 The determination of whether an activity is considered temporary and limited will be
325 made where there is a reasonable factual basis to support such a conclusion. As a
326 general rule of thumb, temporary means days or months, not years, and covers
327 activities that lower water quality on a non-permanent basis such as during construction
328 or optimization.

329 **3.4 Responsibility for Completing Level II ADR Documentation**

330 Early and frequent communication should occur between applicants and DWQ staff.
331 The applicant (owner), or owner’s representative, is responsible for compiling the
332 information required for the selection of Parameters of Concern (Section 4.0),
333 Alternatives Analysis (Section 5.0), and the Statement of Social, Environmental, and
334 Economic Importance (Section 6.0). The applicant is responsible for recommending the
335 parameters of concern and the preferred alternative to DWQ. DWQ staff will assist
336 where possible and provide timely comments to draft material to avoid delays in the
337 permitting process. Much of this information is prepared for other purposes such as a
338 Facility Plan. The suggested process for conducting Level II ADRs is shown in Figure 2.

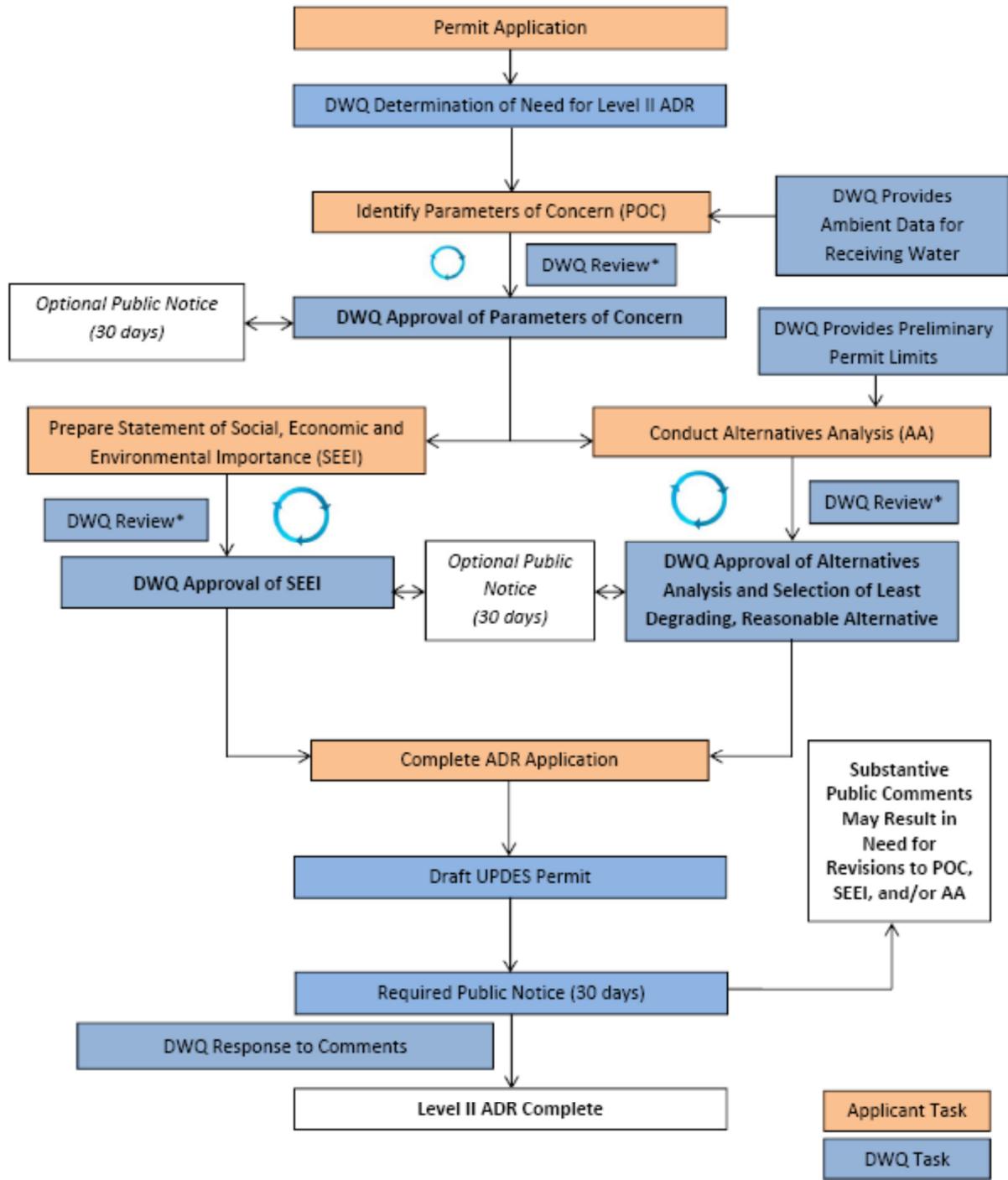
339 For new and expanded discharges, the Alternatives Analysis must be prepared under
340 the supervision of and stamped by a Professional Engineer registered with the State of
341 Utah. DWQ may grant an exception from this requirement under certain circumstances,
342 such as the alternatives considered potentially feasible do not include engineered
343 treatment alternatives.

344 **3.5 Timing of Level II ADRs and Interim Submittals**

345 ADR issues should be considered as early in the permitting or design process as
346 possible. Properly timed Level II ADRs are the most efficient use of time and resources.
347 For instance, many discharges already consider many of the requirements of Level II
348 alternative analyses (Section 5.0) while planning for construction of new facilities or

349 upgrades/expansion to existing facilities. Early planning also allows time to develop an
350 optional work plan which clearly defines a scope of work for developing alternatives.
351 The work plan minimizes miscommunication between DWQ staff and applicants and
352 documents decision points critical to the ADR. The work plan may be put out for public
353 comment, at the applicant's discretion, so that stakeholder concerns can be addressed
354 early in the process, which is much easier and less time consuming than addressing
355 concerns at the end of the permitting process. Finally, early notification provides
356 sufficient time for the DWQ and applicants to work together to ensure that sufficient
357 data are available to generate defensible permit limits. The DWQ suggests that
358 whenever possible applicants initiate ADR processes one year or longer prior to the
359 desired date of a permit. The actual time required to complete the ADR is dependent
360 on the complexity of the ADR. Figure 2 shows the elements required for completing a
361 Level II ADR, including interim submittals and agency review.

362



* Goal is for one review of 30-day duration per section of ADR. Non-responsive revised submittals may result in additional review cycles.

363
364

Figure 2. Process for completing a Level II Antidegradation Review (ADR).

365 **3.6 Public and Interagency Participation in ADRs**

366 Public participation is a required part of the ADR process. Public notice of
367 antidegradation review findings, solicitations of public comment and maintenance of
368 antidegradation review documents as part of the public record help ensure that
369 interested parties can be engaged and involved throughout the review process. In
370 addition, intergovernmental coordination and review is required prior to any action that
371 allows degradation of water quality of a surface water.

372 *3.6.1 Required Public Notification*

373 The completed and signed ADR and associated documentation will be made available
374 for public comment through the processes required for permits (Figure 2). Typically, the
375 required public notice will occur with the draft UPDES permit just prior to issuance. For
376 POTWs that obtain funding from DWQ for construction, the ADR will be public noticed
377 with the Environmental Assessment document and determination, required by NEPA.

378 DWQ is responsible for responding to comments from the mandatory public comment
379 period. The applicant may be required to conduct additional evaluation if substantive
380 comments are received.

381 *3.6.2 Optional Public Notification*

382 The applicant may opt for earlier reviews upon completion of a work plan that defines
383 the parameters of concern and the alternatives to be considered for the Level II ADR
384 alternatives analysis. The primary purpose of these optional early reviews is to identify
385 stakeholder project concerns early in the permitting process when the comments can be
386 addressed most efficiently. If an early review is conducted, concerned members of the
387 public should use the work plan comment period to identify general concerns with the
388 proposed activity, additional parameters of concern that warrant consideration, or
389 additional treatment alternatives that should be considered. Figure 2 identifies decision
390 points in the process when DWQ recommends that the applicant solicit optional public
391 comments.

392 DWQ will facilitate any optional public comment opportunities by making the
393 documents available on DWQ's website and the State's Public Notice website. For the
394 optional public comment periods, DWQ can be the recipient of the comments but the
395 applicant has the responsibility of addressing the comments. A comment response
396 document is not required, but DWQ recommends that the applicant respond to the
397 comments in writing. If DWQ is not the recipient of the comments, the applicant should
398 share the comments received with DWQ in a timely manner. DWQ responds to
399 comments for the mandatory public comment period prior to issuing the permit.

400 *3.6.3 Intergovernmental Coordination and Review*

401 Intergovernmental coordination is required prior to approving a regulated activity
402 that would degrade a surface water. This coordination will be conducted at a level

403 deemed appropriate by the Director and will include any governmental agency
404 requesting involvement with the ADR.

405 **4.0 LEVEL II ADR: PARAMETERS OF CONCERN**

406 Parameters of concern (POC) are evaluated in the Level II ADR. Parameters in the
407 discharge that exceed, or potentially exceed, ambient concentrations in the receiving
408 water should be considered in selecting the parameters of concern. POCs should be
409 identified, ranked and weighted, and submitted to DWQ for review and approval prior
410 to initiation of the alternatives analysis.

411 **4.1 Determination of the Parameters of Concern**

412 The applicant, working with DWQ, should review all available data, from the discharge
413 and the receiving water, and prepare a list of parameters that will be evaluated
414 (potential parameters of concern). DWQ will provide any available data from the
415 receiving water to the applicant. In cases where effluent or receiving water quality data
416 does not exist or is limited, the applicant may voluntarily conduct supplementary
417 sampling and analysis in order to reduce uncertainty associated with identifying POCs.

418 The initial starting point for identifying potential POCs should be the priority
419 pollutants that are known to be or believed to be present in the effluent, as listed in the
420 permit application forms (EPA Form 2 [http://www.waterquality.utah.gov/UPDES/
421 updes_f.htm](http://www.waterquality.utah.gov/UPDES/updes_f.htm)). Other parameters may be added or removed depending on the nature of
422 the proposed project and the characteristics of the receiving water (UAC R317-2-3.5.b).
423 The following are considerations for selecting parameters of concern:

424 1. Is the parameter already included in an existing permit? Parameters with
425 limits in the discharge permit are generally considered POCs.

426 2. Are there any parameters in the effluent, or expected to be in the
427 effluent, that exceed ambient concentrations in the receiving water?

428 Ambient concentrations are determined by DWQ at critical conditions
429 and provided to the applicant. Typically, ambient conditions are based on
430 the most recent 10 years of data. Critical condition for bioaccumulative
431 toxics is considered the 80th percentile concentration and for
432 conventional pollutants and non-bioaccumulative toxics the average
433 concentration. The applicant may elect to collect water quality data to
434 reduce uncertainty and assist DWQ in determining existing ambient
435 concentrations.

436 The effluent concentrations are the permitted effluent limits or discharge
437 concentration of the baseline treatment alternative. For parameters that
438 do not warrant permit effluent limits based on DWQ's reasonable
439 potential analysis, the 80th percentile of the effluent concentrations
440 should be used. If no discharge data are available for the baseline
441 treatment alternative, the concentration should be estimated based on

442 pilot studies, literature values, manufacturer’s guidelines and/or best
443 professional judgment.

444 In cases when the available data are limited, comparisons between
445 effluent/permitted and ambient concentrations may be conducted using
446 methods that minimize type II errors, *i.e.*, erroneously concluding that a
447 pollutant will not degrade water quality.

448 3. Are there any parameters that are considered to be important by DWQ
449 or the general public? For instance, nutrients or bioaccumulative
450 compounds may be of concern for some surface waters. For discharges
451 to Class 1C drinking water sources, any substances potentially deleterious
452 to human health may be considered.

453 4. Is the receiving water listed as impaired for any parameters? Parameters
454 for which the receiving water is listed as impaired and have an ongoing or
455 approved TMDL are not considered as part of the ADR and are addressed
456 through the TMDL program.

457 5. Is the discharge of the parameter temporary and limited? Refer to
458 Section 3.3.4 for guidance on what qualifies as temporary and limited.
459 Parameters that are determined to be temporary and limited are not
460 considered parameters of concern.

461 6. Is the discharge to a freshwater terminal lake? Additional analysis is
462 required to evaluate the degradation and accumulation of the parameter
463 in the lake environment.

464 7. Is the discharge to the Great Salt Lake? Due to uncertainties in the
465 biogeochemical transformation and toxicity of parameters in the Great
466 Salt Lake environment, parameters of concern will be determined on a
467 case-by-case basis utilizing the best available information regarding
468 ambient conditions and assimilative capacity.

469 The list of parameters of concern and parameters evaluated but not considered POCs,
470 including supporting rationale, must be submitted to DWQ. DWQ will review the list
471 and provide preliminary approval pending public comment.

472 Once the list of parameters of concern has been agreed to between DWQ and the
473 applicant, the list may be made available to the public by DWQ for an optional comment
474 period (see Section 3.6.2). After a 30-day comment period, the list may be refined or
475 approved. This list and associated rankings will form the basis for further activities of
476 the ADR and will ultimately be used to select the least degrading project alternative
477 (Section 5).

478 **4.2 Ranking and Weighting the Parameters of Concern**

479 If there is more than one parameter of concern, the parameters of concern may need
480 to be ranked and/or weighted, in order to determine overall water quality degradation
481 of a given alternative. Since no single objective method is possible, the ranking and
482 weighting of POCs will inherently involve some subjectivity and professional judgment,
483 and should be developed in close consultation with DWQ. Potential ranking and
484 weighting factors are provided below. The basis of the ranking and weighting of POCs
485 shall be justified and documented in the ADR application, and approved prior to
486 initiating the alternatives analysis. Examples of detailed quantitative ranking and
487 weighting procedures are provided in Appendix A.

- 488 1. The amount of assimilative capacity available in the receiving water should be
489 a consideration in determining the relative importance of the parameter in the
490 discharge. POCs with greater assimilative capacity in the receiving water are
491 generally considered less important.
- 492 2. For toxic POCs, consideration of the EPA’s toxic weighting factors (TWF) for
493 ranking and weighting the POCs may be appropriate. EPA derives TWFs from
494 chronic aquatic life criteria (or toxic effect levels) and human health criteria (or
495 toxic effect levels) established for the consumption of fish in order to account
496 for differences in toxicity across pollutants and to provide the means to
497 compare mass loadings of different pollutants (EPA 2012). Additional
498 guidance regarding ranking and weighting toxic pollutants using TWFs is
499 provided in Appendix A.
- 500 3. For non-toxic POCs, ranking and weighting factors should reflect the relative
501 potential impact of the POC on the beneficial uses of the receiving water. As
502 this determination involves application of best professional judgment, the
503 weighting factors will need to be developed in consultation with DWQ. An
504 example of ranked and weighted non-toxic POCs is provided in Table 4-1.
- 505 4. Other factors to consider include the sensitivity of the receiving water or
506 downstream waters to the POC and uncertainty associated with the estimated
507 ambient and/or discharge concentration/load.

508
509 Table 4-1: Example Ranking and Weighting of Non-Toxic Parameters of Concern

Parameter	Rank	Weight
Total Phosphorus	1	40%
BOD	2	30%
TSS	3	20%
Total Nitrogen	4	10%
		100%

510

511 **4.3 Optional Public Notice of the Parameters of Concern**

512 Once the POCs are selected, an optional public comment period may be conducted
513 (see Section 3.6.2). If no optional reviews are conducted, the public has an opportunity
514 to comment during the mandatory UPDES public comment period.

515 **5.0 LEVEL II ADR: ALTERNATIVES ANALYSIS**

516 The alternatives analysis requires, to the extent practicable, documentation of the
517 costs and water quality benefits of alternative effluent management options. The
518 purpose of the alternatives analysis is to evaluate whether there are any reasonable
519 non-degrading or less degrading alternatives for the proposed activity.

520 **5.1 Establishing the Baseline Alternative**

521 The Alternatives Analysis requires selecting the baseline alternative, which is defined
522 as the alternative that meets designated uses and associated criteria through water
523 quality based permit effluent limits established by the wasteload analysis or TMDL and
524 any other categorical limits or secondary standards. The cost of the baseline alternative
525 must be estimated for the purpose of assessing the cost reasonableness of less
526 degrading alternatives.

527 **5.2 Developing a Scope of Work for Alternatives Analysis**

528 The intent of this section is to outline a collaborative process to define the scope of
529 work for a Level II review which allows for analysis and document preparation. This step
530 is critical, as the level of effort for the alternatives analysis will depend on the size and
531 complexity of the project and the relative importance and sensitivity of the receiving
532 water.

533 *5.2.1 Collaborative Scoping*

534 The first suggested step in the scoping process will be to convene a meeting between
535 the applicant, project consultants, and DWQ to identify less degrading alternatives to be
536 considered and the level of detail appropriate for the alternatives analysis.

537 The requirements for the scope of the alternatives analysis are found in R317-2-3.5:

538 *For proposed UPDES permitted discharges, the following list of alternatives should be*
539 *considered, evaluated and implemented to the extent feasible:*

- 540 (a) *innovative or alternative treatment options*
- 541 (b) *more effective treatment options or higher treatment levels*
- 542 (c) *connection to other wastewater treatment facilities*
- 543 (d) *process changes or product or raw material substitution*
- 544 (e) *seasonal or controlled discharge options to minimize discharging during critical*
545 *water quality periods*
- 546 (f) *pollutant trading*
- 547 (g) *water conservation*
- 548 (h) *water recycle and reuse*
- 549 (i) *alternative discharge locations or alternative receiving waters*
- 550 (j) *land application*
- 551 (k) *total containment*
- 552 (l) *improved operation and maintenance of existing treatment systems*
- 553 (m) *other appropriate alternatives...*

554 *5.2.2 General Considerations for Selecting Alternatives for Evaluation*

555 The number of alternatives to be considered and the extent of planning details for
556 alternative analyses may depend on the nature of the facility, size of the proposed
557 discharge, the magnitude of degradation, and the characteristics of the receiving water.
558 This section outlines screening procedures for determining reasonable alternatives that
559 are appropriately scaled to the proposed project. The alternatives specified here are
560 guidelines and may be modified from public comments or at the Director's discretion.

561 The following guidelines should be considered when defining the scope of work for
562 the alternatives analysis:

- 563 1. The feasibility of all alternatives should be examined before inclusion in the
564 options to be reviewed in more detail. If an option is initially determined not to
565 be feasible, it does not need to be considered further.
- 566 2. Innovative or alternative treatment options should be limited to proven or
567 successfully piloted processes.
- 568 3. The treatment options subject to review should focus on those which have the
569 greatest potential for water quality improvement for the parameters of concern.
570 Flexibility to modify the treatment process to address potential future changes in
571 waste streams or treatment requirements should also be considered.
- 572 4. When an instream need for the discharge water is deemed by the Director to be
573 of significant importance to the beneficial use (i.e., if removal of the discharge
574 would result in a detrimental loss of stream flow), evaluation of reuse, land
575 disposal or total containment may be unnecessary.
- 576 5. Alternatives may be ranked in order of potential for parameter reduction.
577 Preference should be given to processes that have the greatest overall positive
578 effect on water quality. Typically, these highest ranked processes will have the
579 greatest reduction in pollutant load and affect the greatest number of
580 parameters of concern.
- 581 6. Before improved operations and maintenance are considered as a way to
582 prevent degradation, specific operation or maintenance activities should be
583 identified. If the Director and the applicant agree, a third party may be used to
584 assess potential for operations and maintenance improvements.

585 For many projects, the Facility Plan documents the selection of the preferred
586 treatment option and may be sufficient to meet the alternatives analysis requirement of
587 the ADR depending on the specific parameters of concern.

588 All discharges requiring a permit must be provided with a level of treatment equal to
589 or exceeding the requirements in R317-3 for technology based effluent limitations. As
590 provided in R317-3, minimum technology based treatment requirements for POTWs
591 consist of secondary treatment and applicable limitations and standards. The

592 technology based review for POTWs in the Clean Water State Revolving Fund (SRF)
593 process is accomplished through the Facility Plan and Environmental Assessment. The
594 requirements of the process include an investigation of project need, alternatives,
595 effluent limitations, future conditions, and an Environmental Assessment. The
596 technology based review for POTWs subject to the SRF process generally is satisfied on
597 completion of the Facility Plan, Environmental Assessment, public participation, and
598 DWQ approval. The technology based review for POTWs that are not in the SRF process
599 is conducted through the UPDES permitting process.

600 The technology based review for non-POTW facilities likewise is conducted during the
601 UPDES permitting and technology based requirements and are applied when the permit
602 is drafted. DWQ has adopted categorical standards for discharges from various types of
603 industries. Existing industrial discharges are required to achieve the best conventional
604 pollutant control technology for conventional pollutants and the best available
605 technology for nonconventional and toxic pollutants. Certain new industrial discharges
606 are required to comply with new source performance standards based on the best
607 available demonstrated control technology. Effluent limitations for parameters or
608 industries not covered by the categorical standards and limitations are established on a
609 case-by-case basis, based on best professional judgment. The technology review is
610 complete when the Director approves the draft permit.

611 If a Level II review was conducted for the facility for a previous renewal that was
612 based on the design basis of the facility and a Level II review is required for permit
613 reissuance, the applicant should include a written statement certifying that: 1) all
614 alternative treatment processes remain applicable and that the applicant is not aware of
615 alternatives that were not previously considered, 2) that reasonable alternative
616 operation and maintenance procedures are not available that would reduce degradation
617 of the receiving water if implemented.

618 *5.2.3 Finalizing the Alternatives Analysis Scope of Work*

619 Once a scope of work is agreed to between DWQ and the applicant, the applicant may
620 proceed with completing the alternatives analysis.

621 The applicant may wish to public notice the scope of work for the alternatives
622 analysis. In this case, the scope of work should be documented in a work plan. The
623 work plan can be made available to the public and can be published on the State Public
624 Notice website at the applicant's discretion. This public comment period may be held
625 concurrent with the comment period for the parameters of concern, both of which are
626 optional.

627 Additional alternatives may be identified during the public comment period or during
628 evaluation of the alternatives. These possible changes to the scope of the alternatives
629 analyses should be reviewed by the applicant and DWQ for inclusion in the work plan, as
630 needed.

631 **5.3 Procedures for Selecting the Preferred Alternative**

632 The procedures presented in this section are intended to be applied to those
 633 alternatives that pass initial screening for feasibility. More detailed quantitative ranking
 634 of alternatives by degradation and cost effectiveness may be required depending on the
 635 size and complexity of the project and importance and sensitivity of the receiving water.

636 **5.3.1 Ranking of Alternatives by Degradation**

637 The alternatives should be ranked from the least-degrading to the most-degrading
 638 alternative, as determined from the ranked and weighted pollutants of concern and the
 639 effectiveness of each alternative. Creating a ranked hierarchy of alternatives helps to
 640 simplify the applicant’s selection of the least degrading, reasonable alternative.

641 A method for ranking the alternatives suitable for less complex reviews is to
 642 qualitatively rate the water quality improvement anticipated for each POC under each
 643 alternative. Below is an example scale for determining the benefit of each alternative
 644 for the given parameter of concern (Tables 5-1 and 5-2). The applicant may propose
 645 other qualitative ranking methods as an alternative to the example provided.

646 Table 5-1: Example Water Quality Improvement Ratings

Water Quality Improvement	Rating
Minor Improvement	1
Fair Improvement	2
Good Improvement	3
Excellent Improvement	4
No Degradation	5

647

648 Table 5-2: Example Qualitative Alternative Rankings by Degradation (from least to most)

Alternatives	POC A		POC B		POC C		Weighted Rating	Rank
	Rating	Weight ¹	Rating	Weight ¹	Rating	Weight ¹		
Alternative 4	5	50%	4	30%	4	20%	4.5	1
Alternative 5	3	50%	5	30%	5	20%	4	2
Alternative 2	4	50%	2	30%	3	20%	3.2	3
Alternative 1	2	50%	3	30%	4	20%	2.7	4
Alternative 3	2	50%	3	30%	2	20%	2.3	5

1: Weighting factor from the ranking and weighting of POCs.

649

650 An example of a detailed quantitative ranking and weighting procedure that would be
 651 appropriate for more complex and detailed analyses is provided in Appendix A.

657 5.3.2 Evaluation of Feasibility of Alternatives

658 After ranking the alternatives by degradation, the applicant will need to evaluate
659 whether it would be reasonable to select a less degrading alternative. The factors that
660 determine if an alternative is reasonable are cost effectiveness and affordability. Cost
661 effectiveness and affordability are addressed in the rule (R317-2-3.5.c), which states:

662 *“An option more costly than the cheapest alternative may have to be*
663 *implemented if a substantial benefit to the stream can be realized. Alternatives*
664 *would generally be considered feasible where costs are no more than 20% higher*
665 *than the cost of the discharging alternative, and (for POTWs) where the*
666 *projected per connection service fees are not greater than 1.4% of MAGI (median*
667 *adjusted gross household income), the current affordability criterion now being*
668 *used by the Water Quality Board in the wastewater revolving loan program.*
669 *Alternatives within these cost ranges should be carefully considered by the*
670 *discharger. Where State financing is appropriate, a financial assistance package*
671 *may be influenced by this evaluation, i.e., a less polluting alternative may receive*
672 *a more favorable funding arrangement in order to make it a more financially*
673 *attractive alternative.”*

674 Additional guidance on how to evaluate cost effectiveness and affordability are
675 provided in the sections below.

676 5.3.2.1 Cost Effectiveness

677 An alternative must be cost effective to be considered reasonable. Cost effectiveness
678 should be evaluated in two ways: overall cost increase and unit cost of pollutant
679 removal in comparison to the baseline alternative.

680 The total cost increase of each alternative needs to be estimated. The cost estimate is
681 typically based on a concept level design with limited engineering; sufficient detail in the
682 cost estimate should be provided so that the basis can be verified. The estimate should
683 be the Net Present Value (NPV) of the 20-year life-cycle cost including land acquisition,
684 capital cost, and operation and maintenance (O&M) costs. For simplicity, it may be
685 assumed that the discount rate equals the inflation rate in order to estimate operation
686 and maintenance costs in today’s dollars, i.e. NPV of O&M equals 20 times O&M annual
687 cost. The applicant may propose the use of an alternate discount rate, along with
688 justification. For upgrades to existing facilities, only the cost basis for the upgrade
689 should be considered, i.e. additional capital and O&M costs.

690 In some cases, the applicant will be requested to calculate unit costs for pollutant
691 removal to provide additional information to evaluate the relative cost effectiveness of
692 each of the treatment alternatives. Refer to Appendix A for detailed procedures for
693 estimating unit costs.

694 5.3.2.2 Affordability

695 Although a 20% total cost increase is generally considered the threshold for both cost
696 effectiveness and affordability, the applicant may provide additional information on the
697 affordability of the less degrading alternative.

698 For public sector discharges, alternatives where the projected per connection service
699 fees are not greater than 1.4% of the median adjusted gross household income are
700 generally considered affordable. This is the affordability criterion currently being used
701 by the Water Quality Board for the wastewater revolving loan program. Secondary
702 socioeconomic factors that can be considered to evaluate affordability for public-sector
703 discharges include debt indicators (such as bond rating and overall net debt),
704 socioeconomic indicators (such as unemployment rate), and financial management
705 indicators (such as property tax revenue and property tax collection rate).

706 For private sector discharges, the determination of the affordability of less degrading
707 alternatives will be based on an evaluation of the effect on profitability, liquidity,
708 solvency and leverage of the entity in comparison to industry benchmarks.

709 Worksheets to assist with the calculation of these economic indicators are available
710 from EPA (<http://water.epa.gov/scitech/swguidance/standards/economics/>).

711 5.3.2.3 Other Considerations

712 In selecting the preferred alternative, the following additional items should be
713 considered and evaluated:

714 1. Alternative Operations and Maintenance (O&M) scenarios should be considered
715 in the ranking process. An Alternative O&M scenario will generally be considered
716 feasible if the annual cost increase is no more than 10% of the annual operating
717 cost or 20% of the 20-year NPV, whichever is less.

718 2. In evaluating the feasibility of alternatives, the review should consider the
719 current zoning for the community surrounding the facility.

720 3. The review of the selected alternative should also include factors such as
721 reliability, maintainability, operability, sustainability, and adaptability to
722 potentially changing discharge requirements.

723 Sustainability for the purposes of this evaluation is defined as the degree that
724 the management method minimizes the depletion or damage to natural
725 resources.

726 4. When different alternatives have similar potential to reduce degradation of
727 water quality, other ancillary water quality benefits should be considered such as
728 maintenance or enhancement of instream flow or habitat.

729 5. Optional mitigation projects may also be included with any selected alternative
730 when it is deemed to be cost effective and environmentally beneficial. If the
731 discharger includes a mitigation project with an alternative, consideration should
732 be given to the expected net benefits to water quality of both the discharge and
733 mitigations when ranking project alternatives.

734 **5.3.3 *Selecting the Preferred Alternative***

735 Based on all of the factors considered, the applicant will recommend the preferred
736 alternative to DWQ for review and approval.

737 For DWQ to fairly evaluate alternatives, the following information should be provided
738 for each alternative process:

- 739 1. A technical description of the treatment process.
- 740 2. Rank alternatives from least degrading to most degrading based on the mass of
741 pollutants removed.
- 742 3. Evaluation of cost effectiveness, including estimation of total cost and unit cost
743 for pollutant removal.
- 744 4. Evaluation of affordability, if necessary.
- 745 5. Evaluation of the reliability, maintainability, operability, sustainability, and
746 adaptability of each alternative.

747 **5.4 Optional Public Notice of the Alternatives Analysis**

748 Once the preferred alternative is selected, an optional public comment period may be
749 conducted (see Section 3.6.2). If no optional reviews are conducted, the public has an
750 opportunity to comment during the mandatory UPDES public comment period.

751

752 **6.0 LEVEL II ADR: STATEMENT OF SOCIAL, ENVIRONMENTAL,**
753 **AND ECONOMIC IMPORTANCE (SEEI)**

754 Beyond the alternatives analysis, the second key component of a Level II ADR is a
755 Statement of Social, Environmental, and Economic Importance (SEEI). The SEEI
756 evaluates the societal benefits of the proposed activity by documenting factors such as:
757 employment, production, tax revenues, housing, and correction of other societal
758 concerns (i.e., health or environmental concerns). This portion of the ADR provides the
759 project proponent the opportunity to document that the overall benefits of the project
760 outweigh any negative consequences to water quality. As a result, the project
761 proponent is best served by making this portion of the ADR as thorough as possible. At
762 a minimum this portion of the review should contain the following:

- 763 1. A description of the communities directly affected by the proposed project,
764 including factors such as: rate of employment, personal or household
765 income, poverty level, population trends, increasing production, community
766 tax base, etc.
- 767 2. An estimate of important social and economic benefits that would be
768 realized by the project, including the number and nature of jobs created and
769 projected tax revenues generated.
- 770 3. An estimate of any social and economic costs of the project, including any
771 impacts on commercial or recreational uses.
- 772 4. A description of environmental benefits of the project and associated
773 mitigation efforts (if any). For instance, if a project would result in an
774 increase in stream flow that would provide additional habitat and a net
775 benefit to stream biota, this benefit would be documented in this section of
776 the review.
- 777 5. Documentation of local government support.

778 As with the Alternatives Analysis portion of the ADR, the size and scope of the SEEI
779 should be commensurate with the size of the proposed project. The applicant may
780 reference existing documents that address alternatives such as an Environmental
781 Impact Statement. Also, it is in the best interest of the project proponent to make the
782 SEEI as thorough as possible if the project is likely to be controversial.

783

784 **6.1 Regulatory Framework**

785 The need for SEEs comes from 40 CFR 131.12(a)(2), which states, “Where the quality
786 of waters exceeds levels necessary to support fish, shellfish, and wildlife and recreation
787 in and on the water, the quality shall be maintained and protected unless the State
788 finds, ..., that allowing lower water quality is necessary to accommodate social or
789 economic development in the area in which the waters are located...” (emphasis added).

790 Accordingly, UAC R317-2-3.5(c)4 specifically calls for SEEI demonstrations:

791 *“Although it is recognized that any activity resulting in a discharge to surface*
792 *waters will have positive and negative aspects, information must be submitted by*
793 *the applicant that any discharge or increased discharge will be of economic or*
794 *social importance in the area.*

795 *The factors addressed in such a demonstration may include, but are not limited*
796 *to, the following:*

797 *(a) employment (i.e., increasing, maintaining, or avoiding a reduction in*
798 *employment);*

799 *(b) increased production;*

800 *(c) improved community tax base;*

801 *(d) housing;*

802 *(e) correction of an environmental or public health problem; and*

803 *(f) other information that may be necessary to determine the social and*
804 *economic importance of the proposed surface water discharge.”*

805

806 **6.2 Important Considerations in Developing SEEs**

807 This section provides guidance for some of the social, environmental, and economic
808 considerations that the applicant may want to include with the SEEI portion of the Level
809 II ADR. The DWQ anticipates that the specific information provided in the SEEI will vary
810 depending on the nature of the project and the community or communities that will be
811 affected by the proposed activity. Many of the decisions relating to the social,
812 environmental, and economic considerations are local in nature and the local
813 government agencies should be consulted to determine directions that are appropriate.

814 The SEEI is about demonstrating that the degradation will support important social,
815 environmental, and economic development in the local area. The SEEI is not about the
816 economic benefits to an individual or corporation. Instead, the SEEI is intended to
817 support an informed public discussion and decision about the pros and cons of allowing
818 water quality degradation. If the lowering of water quality resulting from the preferred
819 alternative is not in the overriding public interest, then a non-degrading alternative
820 must be selected or the permit will be denied. If the lowering of water quality is found
821 to be in the overriding public interest, this finding is documented and submitted for
822 public comment along with the draft permit incorporating the preferred alternative.

823 Following are the factors that should be considered while preparing the SEEI:

824 1. Effects on Public Need/Social Services

825 Identify any public services, including social services that will be provided to or
826 required of the communities in the affected area as a result of the proposed
827 project. Explain any benefits that will be provided to enhance health/nursing
828 care, police/fire protection, infrastructure, housing, public education, etc.

829 2. Effects on Public Health/Safety

830 Identify any health and safety services that will be provided to or required of
831 the communities in the affected area as a result of the proposed project.
832 Explain any benefits that will be provided to enhance food/drinking water
833 quality, control disease vectors, or to improve air quality, industrial hygiene,
834 occupational health or public safety. One example is the construction of a
835 central treatment plant to correct problems with failing septic systems.
836 Another example might be removal or additions of toxic or bacteriological
837 pollutants, which reduce life expectancy and increased illness rates.

838 3. Effect on Quality of Life

839 Describe the impacts of the proposed project on the quality of life for
840 residents of the affected area with respect to educational, cultural and
841 recreational opportunities, daily life experience (dust, noise, traffic, etc.) and
842 aesthetics (viewscape).

843

- 844 4. Effect on Employment
- 845 Explain the impacts of the proposed project on employment practices in the
- 846 affected area. Identify the number and type of jobs projected to be gained or
- 847 lost as a result of the proposed project. Will the proposed project improve
- 848 employment or mean household income in the affected area?
- 849 5. Effect on Tax Revenues
- 850 Explain the impact of the proposed project on tax revenues and local or county
- 851 government expenditures in the affected area. Will the project change
- 852 property values or the tax status of properties? If yes, explain whether that
- 853 change is a beneficial or detrimental to residents/businesses in the affected
- 854 area.
- 855 6. Effect on Tourism
- 856 Discuss the effects the proposed project may have on the economy of the
- 857 affected area by creating new or enhancing existing tourist attractions.
- 858 Conversely, describe any impacts resulting from the elimination of or
- 859 reduction in existing attractions.
- 860 7. Preservation of assimilative capacity
- 861 Review the pros and cons of preserving assimilative capacity for future
- 862 industry and development. Applicants are encouraged to talk with local
- 863 stakeholders such as planning, zoning, and economic development officials
- 864 about their development plans, and should summarize the communities'
- 865 position on utilizing assimilative capacity for the proposed project versus
- 866 future plans or needs.
- 867 8. Other Factors
- 868 Provide any other information that would explain why it is necessary to lower
- 869 water quality to accommodate this proposed project. This category should be
- 870 used to address any social or economic factors not considered above.

871 **6.3 Review and Approval of SEEs**

872 Important social, economic or environmental activity refers to an activity that is in the

873 overriding public interest. The Director will generally consider public projects to be

874 necessary to accommodate social and economic growth unless compelling information

875 exists to the contrary. DWQ may consult with local and State planning and zoning

876 agencies to determine whether or not the project is consistent with the long-term plans

877 of affected communities. Information obtained from local planning groups may be

878 compiled with other material obtained through the ADR process. The Director will make

879 a determination. Appeals to the Director's decision may be made consistent with the

880 procedures for administrative appeals.

881 **6.4 Optional Public Notice of the SEEI**

882 At a minimum the SEEI material will be submitted for public comment, along with all
883 other Level II ADR materials, through the required public comment processes used for
884 permit applications and renewals. However, the applicant may include a cursory, or
885 preliminary, SEEI with the work plan, because much of the information described in SEEI
886 reports help explain the greater socioeconomic context within which the project takes
887 place.

888

889 **7.0 SPECIAL PERMIT CONSIDERATIONS**

890 Most of the implementation procedures discussed in this document are clearly
891 applicable to UPDES permitting procedures. However, the DWQ also issues other types
892 of permits, which have special ADR considerations. This portion of the guidance is
893 incomplete and the reader should contact DWQ for assistance regarding these permits
894 in the interim.

895 **7.1 Individual Stormwater Permits**

896 This portion of the guidance is incomplete and the reader should contact DWQ for
897 assistance in the interim. Stormwater permits are subject to an ADR unless the impact
898 to water quality is temporary and limited.

899 **7.2 General Permits**

900 A number of discharges to surface waters are authorized under general UPDES
901 permits issued by the DWQ:

- 902 • Concentrated animal feeding operations (CAFO)
- 903 • Concentrated aquatic animal feeding operations
- 904 • Construction dewatering or hydrostatic testing
- 905 • Construction site stormwater
- 906 • Municipal stormwater
- 907 • Industrial stormwater
- 908 • Drinking water treatment plants
- 909 • Private on-site wastewater treatment systems
- 910 • Coal mining operations
- 911 • Discharge of treated groundwater
- 912 • Application of pesticides

913

914 New and reissued General Permits will be reviewed for compliance with
915 antidegradation provisions as described in this section.

916 Individual regulated activities authorized under General Permits through Notice of
917 Intent (NOI) procedures are covered under the antidegradation review for the General
918 Permit and will typically not be required to conduct a Level II ADR. DWQ, after reviewing
919 the submitted NOI, may require an eligible discharge to undergo a Level II Review if it is
920 determined that significant degradation may occur as a result of cumulative impacts
921 from multiple discharges to a water body, as a result of impacts from a single discharger
922 over time, and/or due to the sensitivity of the receiving water.

923 UPDES General Permits require that discharges authorized under the permit do not
924 violate water quality standards and best management practices (BMP) contained in the
925 permit are implemented. Compliance with the terms of the General Permit is required
926 to maintain authorization to discharge.

927 An antidegradation review will be conducted for the entire class of general permittees
928 that are authorized under the General Permit. The antidegradation review will consist of
929 the following items:

- 930 1) *Identify the pollutants that may contribute to water quality degradation.*
931 The pollutants that are reasonably expected to occur in discharges covered under
932 the General Permit will be identified. These pollutants will be considered to have
933 the potential to degrade high quality waters.
- 934 2) *Ensure that existing uses of the receiving waters will be protected.*
935 The discharge of pollutants must not impair the existing uses of receiving waters.
936 Methods that may be utilized to demonstrate the protection of existing uses
937 include the determination of water quality based effluent limits (WQBEL) through
938 a wasteload analysis, acute and/or chronic whole effluent toxicity (WET) testing,
939 and implementation of best management practices (BMP) for stormwater and best
940 practicable technology (BPT) for treatment of process water.
- 941 3) *Documentation and public notice of the antidegradation review.*
942 The antidegradation review will be documented and public noticed with the draft
943 General Permit.

944 The level of effort of the antidegradation review will depend on the nature of the
945 General Permit, the number of dischargers anticipated to fall under the permit, and the
946 sensitivity of the receiving waters; however, the level of effort will typically be limited
947 since discharges with a significant potential to degrade water quality are required to
948 obtain an individual discharge permit.

949 **7.3 §401 Water Quality Certifications**

950 The Clean Water Act gives authority to each state to issue a 401 Water Quality
951 Certification (§401 Certification) for any project that needs a Section 404 Permit, NPDES
952 permit issuance, and FERC hydropower licenses. The §401 Certification is a verification
953 by the state that the project will not violate water quality standards. DWQ works with
954 applicants to avoid and minimize impacts to water quality and may require actions on
955 projects to protect water quality. These required actions are called conditions.

956 **7.3.1 §404 Dredge and Fill Permits**

957 Section 404 of the Clean Water Act regulates the placement of dredged or fill material
958 into the “waters of the United States.”. The U.S. Army Corps of Engineers (USACE)
959 administers the §404 permit program dealing with these activities (e.g., wetland fills, in-
960 stream sand/gravel work, etc.) in cooperation with the EPA and in consultation with
961 other public agencies. Nationwide general permits are issued for activities with impacts
962 not deemed to be significant. Individual permits are issued for activities that are
963 considered to have more than minor adverse impacts. For both individual and
964 nationwide §404 permits, states have an obligation to certify, certify with conditions, or
965 not certify §404 permits under §401 of the Clean Water Act. Antidegradation reviews

966 involving the placement of dredged or fill material will be performed via the §401
967 Certification process.

968 Section 73-3-29 of the Utah Code requires any person, governmental agency, or other
969 organization wishing to alter the bed or banks of a natural stream to obtain written
970 authorization from the State Engineer prior to beginning work. The Stream Alteration
971 Program was implemented in 1972 in order to protect the natural resource value of the
972 state's streams and protect the water rights and recreational opportunities associated
973 with them. In 1988, the U.S. Army Corps of Engineers issued Regional General Permit 40
974 (GP-40) which allows an applicant to obtain both state approval and authorization under
975 Section 404 of the Clean Water Act through a single application process. Although not all
976 stream alteration activities qualify for approval under GP-40, many minimal impact
977 projects can be approved under this joint permit agreement. These activities are subject
978 to ADR requirements (R317-2-3.5.a.1.).

979 Antidegradation and compliance with water quality standards will be addressed and
980 implemented through DWQ's §401 Water Quality Certification process. Applicants who
981 fulfill the terms and conditions of applicable §404 Permits and the terms and conditions
982 of the corresponding §401 Water Quality Certification will have fulfilled the
983 antidegradation requirements. Additional antidegradation considerations may be
984 incorporated into §404 Permits and the corresponding §401 Water Quality Certifications
985 at the time of permit issuance. DWQ will not issue a §401 Water Quality Certification
986 where degradation resulting from the project is not necessary to accommodate
987 important social, environmental, or economic development.

988 The decision making process for Individual §404 Permits is contained in the §404(b)(1)
989 guidelines (40 CFR Part 230) and contains the elements for a Level I and Level II ADR.
990 Prior to issuing a permit under the §404(b)(1) guidelines, USACE must: 1) make a
991 determination that the proposed discharges are unavoidable (i.e., necessary); 2)
992 examine alternatives to the proposed activity and authorize only the least damaging
993 practicable alternative; and 3) require mitigation for all impacts associated with the
994 activity. A §404(b)(1) findings document is produced as a result of this procedure and is
995 the basis for the permit decision. Public participation is also provided for in this process.
996 Level I and Level II ADRs will be met through §401 Water Quality Certification of
997 Individual §404 Permits that will typically rely upon the information contained in the
998 §404(b)(1) findings document. However, if significant water quality degradation may
999 occur as a result of the proposed activity, DWQ will require the applicant to provide
1000 additional documentation to complete a formal Level II Review.

1001 For activities covered under a Nationwide §404 Permit, the antidegradation review
1002 will be conducted in conjunction with DWQ's review of the Nationwide Permit for §401
1003 Water Quality Certification. The antidegradation review for Nationwide Permits will be
1004 conducted by DWQ similar to the process for UPDES General Permits (Section 7.2). For
1005 minor activities covered under Nationwide Permits (e.g., road culvert installation, utility
1006 line activities, bank stabilization, etc.), antidegradation requirements will be deemed to
1007 be met if all appropriate and reasonable BMPs related to erosion and sediment control,

1008 project stabilization, and prevention of water quality degradation are applied and
1009 maintained. The §401 Water Quality Certification may place additional conditions upon
1010 the Nationwide Permit to prevent or minimize water quality degradation.

1011 *7.3.2 Federal Energy Regulatory Commission Licenses*

1012 The Federal Energy Regulatory Commission (FERC) licenses the operation of dams that
1013 generate hydroelectric power. Applicants for these licenses are required to obtain §401
1014 Water Quality Certification. Antidegradation and compliance with water quality
1015 standards will be addressed and implemented through DWQ's §401 Water Quality
1016 Certification process. Applicants who fulfill the terms and conditions of an applicable
1017 FERC license and the terms and conditions of the corresponding §401 Water Quality
1018 Certification will have fulfilled antidegradation requirements. DEQ will not issue a §401
1019 Water Quality Certification where degradation resulting from the project is not
1020 necessary to accommodate important social or economic development. Hydroelectric
1021 dams affect water quality in the impounded reservoir and in the downstream receiving
1022 water. The antidegradation review for the water quality certification will focus on the
1023 degradation in water quality that may result from the construction of the dam and
1024 operation of the reservoir. DWQ may place conditions on operations or require other
1025 actions to mitigate the effects on water quality.

1026 As part of the antidegradation review for the §401 Water Quality Certification for a
1027 FERC License, DWQ will require the applicant to complete a formal Level II Review if
1028 significant water quality degradation may occur.

1029 When a project undergoes relicensing with FERC, the relicensing certification process
1030 will compare the water quality under the current FERC license with projected water
1031 quality in the future under the proposed FERC license. If this comparison shows no
1032 additional degradation in water quality, then a Level II Review will not be required.

1033

1034 **8.0 FUTURE ITERATIONS OF THE IMPLEMENTATION GUIDANCE**

1035 For the topics listed below in Section 8.1, the guidance is incomplete. The existing
1036 guidance provided for these topics represents DWQ's current thinking but is incomplete
1037 and should be applied with caution. For activities requiring ADRs, but not yet completely
1038 addressed in guidance, the permittee should consult DWQ for assistance. These ADRs
1039 will be conducted on a case-by-case basis consistent with the requirements of R317-2-3.

1040 **8.1 Planned Future Additions to the Guidance**

- 1041
- 1042 1. Stormwater Permits. Guidance for municipal, industrial and construction stormwater
1043 permitting.
 - 1044 2. Pretreatment Program. Guidance for how antidegradation provisions should be applied to
1045 the pretreatment program.

1046

1047 **REFERENCES**

1048 Environmental Protection Agency. 2008. Toxic Weighting Factors Database (Excel Spreadsheet).
1049 Environmental Protection Agency, Office of Water, Washington, D.C. EPA-HQ-OW-2008-0517-
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1051 Environmental Protection Agency. 2012. Toxic Weighting Factors Methodology. United States
1052 Environmental Protection Agency, Office of Water, Washington, D.C. EPA - 820-R-12-005

1053 Utah Division of Water Quality. 2014. Utah Division of Water Quality: Quality Assurance
1054 Program Plan for Environmental Data Operations. State of Utah, Department of Environmental
1055 Quality, Division of Water Quality.

1056 **APPENDIX A**
 1057 **EXAMPLE PROCEDURES FOR RANKING AND WEIGHTING**
 1058 **PARAMETERS OF CONCERN AND ALTERNATIVES**

1059
 1060 This appendix provides example procedures for ranking and weighting parameters of
 1061 concern and alternatives that would be appropriate for more complex reviews.
 1062

1063 **A-1 Ranking and Weighting Parameters of Concern**

1064 This section provides an example of how to quantitatively rank and weight toxic
 1065 parameters that may be appropriate for more complex reviews. Example ranking and
 1066 weighting calculations shown below are provided in the *UDWQ ADR Spreadsheet Tools*
 1067 that are a companion to this guidance document.
 1068

- 1069 1. Determine the assimilative capacity of the receiving water for each pollutant.
 1070 The assimilative capacity is determined by comparing the ambient concentration
 1071 in the receiving water to the water quality criteria for each pollutant. Ambient
 1072 concentration is characterized by a summary statistic such as the average or 80th
 1073 percentile value of the data. The water quality criteria can be found in UAC
 1074 R317-2-14 and may be temperature, pH and/or hardness dependent. An
 1075 example calculation of the assimilative capacity in the receiving water is shown
 1076 in Table A-1.

1077
 1078 Table A-1: Example Assimilative Capacity Determination

Parameter of Concern	Ambient Concentration (mg/L)	Water Quality Criteria (mg/L)	Assimilative Capacity	
			Used ¹	Available ²
A	0.85	1.25	68%	32%
B	0.06	0.95	6%	94%
C	2.5	5.0	50%	50%

1: Assimilative Capacity Used = (Ambient Concentration/Water Quality Criteria) * 100
 2: Assimilative Capacity Available = 100 – Assimilative Capacity Used

- 1079
 1080 2. Determine the toxic weighting factor for each pollutant.
 1081 EPA derives TWFs from chronic aquatic life criteria (or toxic effect levels) and
 1082 human health criteria (or toxic effect levels) established for the consumption of
 1083 fish in order to account for differences in toxicity across pollutants and to
 1084 provide the means to compare mass loadings of different pollutants (EPA 2012).
 1085 EPA considers TWFs appropriate for use in the calculation of cost-effectiveness
 1086 values because such values only serve as indicators of the relative cost
 1087 effectiveness of treatment technology options and not as absolute metrics.
 1088

1089 EPA has calculated TWFs for 1,064 chemicals and the equations and results for

1090 calculating TWFs are contained in a set of Excel Worksheets known as the TWF
1091 Database (EPA 2008).

1092
1093 In addition, the TWFs can be used to calculate toxic weighted pound equivalents
1094 (TWPE) of pollutant removed as described below.

1095 3. Rank and weight the toxic parameters of concern based on assimilative capacity
1096 and TWF.

1097 The assimilative capacity used and toxic weighting factor can be multiplied to
1098 calculate a factor (assimilative capacity-toxic weighting factor) that may be used
1099 to rank and weight the POCs. An example of ranked and weighted toxic POCs is
1100 provided in Table A-2.

1101

1102 Table A-2: Example Ranking and Weighting of Toxic Parameters of Concern

Parameter of Concern	Rank	Assimilative Capacity Used	Toxic Weighting Factor	Assimilative Capacity - Toxic Weighting Factor
A	1	68%	4.04	2.75
B	2	6%	23.10	1.46
C	3	50%	0.63	0.32

1103

1104 **A-2 Ranking Alternatives**

1105 This section provides an example of how to quantitatively rank alternatives for more
1106 complex reviews. Example ranking and weighting calculations shown below are
1107 provided in the *UDWQ ADR Spreadsheet Tools* that are a companion to this guidance
1108 document.

1109 Evaluation of Degradation

1110 For more complex evaluations of alternatives, the ranking of alternatives should be
1111 based on the development of a matrix giving the weighting of each parameter of
1112 concern and the mass of pollutant removed by each alternative. The applicant will need
1113 to estimate the mass of each parameter removed by each treatment alternative based
1114 on the best available information. Toxic and non-toxic pollutants should be evaluated
1115 separately.

1116 Example procedures for ranking the alternatives for toxic pollutants are provided
1117 below:

- 1118 1. Estimate the amount removed of each pollutant for each alternative.

1119 Based on the best available information, estimate the amount of each
1120 pollutant removed, or not discharged to the receiving water, for each
1121 alternative. Because toxic pollutants differ in the amount that is considered
1122 toxic, the reductions in pollutant discharges need to be adjusted for toxicity by
1123 multiplying the estimated removal quantity for each pollutant by a normalizing
1124 weight, called a toxic weighting factor (TWF). The TWF for each pollutant
1125 measures its toxicity relative to copper, with more toxic pollutants having
1126 higher TWFs. The use of toxic weights allows the removals of different
1127 pollutants to be expressed on a constant toxicity basis as toxic weighted
1128 pound-equivalents (TWPE, lb-eq) and summed to yield an aggregate measure
1129 of the reduction in pollutant discharge that is achieved by a treatment
1130 alternative (Table A-3).

1131 EPA has calculated TWFs for 1,064 chemicals and the equations and results for
1132 calculating TWFs are contained in a set of Excel Worksheets known as the TWF
1133 Database (EPA 2008).

1134

1135 Table A-3: Example Toxic Pollutant Removal Estimation for an Alternative

Toxic Parameter	Influent		Effluent		Removal		Toxic Weighting Factor	TWPE Removal (lb-eq/yr)
	(mg/L)	(lb/day)	(mg/L)	(lb/day)	(lb/yr)	(%)		
Ammonia	1	3.61	0.1	0.36	1,184.3	90%	0.0014	1.7
Arsenic	0.05	0.18	0.005	0.02	59.2	90%	4.04	239.2
Cadmium	0.02	0.07	0.005	0.02	19.7	75%	23.1	456.0
Copper	0.05	0.18	0.005	0.02	59.2	90%	0.63	37.3
Hexavalent chromium	0.05	0.18	0.005	0.02	59.2	90%	0.51	30.2
Iron	0.07	0.25	0.01	0.04	79.0	86%	0.0056	0.4
Lead	0.05	0.18	0.005	0.02	59.2	90%	2.24	132.6
Mercury	0.0001	0.00036	0.0001	0.00036	-	0%	120	0.0
Selenium	0.05	0.18	0.05	0.18	-	0%	1.1	0.0
Silver	0.01	0.04	0.004	0.01	7.9	60%	16.5	130.3
Total chromium	0.05	0.18	0.005	0.02	59.2	90%	0.076	4.5
Total residual chlorine	0.5	1.80	0.01	0.04	644.8	98%	0.509	328.2
Zinc	0.04	0.14	0.005	0.02	46.1	88%	0.047	2.2
Total								1,362.6

1136

1137

2. Rank the alternatives based on total equivalent weight removed.

1138

Using the total toxic weighted pound equivalents removed, rank the alternatives (Table A-4).

1139

1140

Table A-4: Example Alternatives Ranking by Toxic Pollutant Removal

Alternative	Removal (lb-eq/yr)	Rank
Alternative 4	1,333	1
Alternative 5	1,012	2
Alternative 2	957	3
Alternative 3	886	4
Alternative 1	759	5

1141

1142

For non-toxic pollutants such as TSS, BOD, TN, and TP, due to the varying mass of each pollutant observed in the discharge, the amount removed needs to be normalized. The suggested approach is to calculate a unitless removal ratio of pollutant removal for each alternative to the maximum pollutant removal amongst all of the alternatives (Table A-5); however, other normalization methods could be appropriate.

1143

1144

1145

1146

1147 Table A-5: Example Alternatives Ranking by Pollutant Removal for Non-Toxic Pollutants

Alternatives	POC A			POC B			POC C			Weighted Removal Ratio	Rank
	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²		
Alternative 4	15	0.75	50%	15	0.50	30%	20	1.00	20%	0.73	1
Alternative 2	15	0.75	50%	10	0.33	30%	20	1.00	20%	0.68	2
Alternative 3	20	1.00	50%	5	0.17	30%	10	0.50	20%	0.65	3
Alternative 1	10	0.50	50%	20	0.67	30%	15	0.75	20%	0.60	4
Alternative 5	8	0.40	50%	30	1.00	30%	10	0.50	20%	0.60	5
Baseline	10	0.50	50%	8	0.27	30%	15	0.75	20%	0.48	6
Maximum	20			30			20				
<p>1: POC removal normalized to maximum removal of all treatment alternatives, i.e. ratio of removal from alternative to max. removal of all alternatives.</p> <p>2: Weighting factor from the ranking and weighting of POCs.</p>											

1148

1149 Evaluation of Cost Effectiveness

1150 In some cases, the applicant will be requested to calculate unit costs for pollutant
1151 removal to provide additional information to evaluate the relative cost effectiveness of
1152 each of the treatment alternatives. The unit cost of toxic pollutant removal is calculated
1153 using the total cost of the alternative and the equivalent pollutant mass removed that
1154 was previously determined (Table A-6).

1155 Table A-6: Example Cost Effectiveness of Alternatives for Toxic Pollutant Removal

Alternative	Total Cost	Total Cost Increase	Pollutant Removal (lb-eq)	Unit Cost (\$/lb-eq/yr)	Unit Cost Increase
Alternative 1	\$1,100	10%	14	\$78.57	-18.3%
Alternative 2	\$1,400	40%	14.5	\$96.55	0.4%
Alternative 3	\$1,300	30%	13.5	\$96.30	0.1%
Alternative 4	\$2,000	100%	16	\$125.00	30.0%
Alternative 5	\$1,500	50%	15	\$100.00	4.0%
Baseline	\$1,000		10.4	\$96.15	

1156

1157 Since it is not possible to determine an equivalent mass of removal for non-toxic
1158 pollutants, the unit cost should be presented for each non-toxic pollutant under each
1159 alternative.