Appendix J. Public Comments and Responses

Table. J-1. Letters received from BRCRAC members and the public

Letter Number	Responder Type	Response Type	First Name	Last Name	Organization	Address	City	State	Zip
01	Business	Letter	David	Clark	HDR on behalf of City of Logan	412 E Parkcenter Blvd, Suite 100	Boise	ID	83706
02	Business	Letter	Jerry	Petersen	JBS/Hydroqual	1200 MacArthur Blvd.	Mahwah	NJ	07430
03	Individual	Email	Dave	Powelson		1067 N. 1730 E.	Logan	UT	84341
04	Business	Letter	Bret	Randall	Durham Jones & Pinegar, P.C.	111 E. Broadway Ste. 900	Salt Lake City	UT	84110
05	Business	Email	Eve	Davies	HydroResources, PacifiCorp Energy	1407 W. North Temple Ste. 110	Salt Lake City	UT	84116
06	Organization	Letter	Jeff	Salt	Great Salt Lake Keeper	PO Box 522220	Salt Lake City	UT	84152
08	Individual	Email	Sharell	Eames			Providence	UT	
09	Individual	Email	Denise	Strong					
10	Individual	Letter	Keith	Thompson		PO Box 144	Providence	UT	84332
12	Business	Email	Eric	Dodson	TTM Technologies	710 N. 600 W.	Logan	UT	84321
14	Individual	Email	Martin	Smith					
15	Individual	Email	Shaun	Dustin	USU USTAR Biofuels Initiative	4130 Old Main Hill	Logan	UT	84322
17	Individual	Email	Scott	Steffenhagen			Hyde Park	UT	
18	Individual	Letter (August 2009)	Bryan	Dixon		10 Heritage Cove	Logan	UT	84321
19	Government	Letter	Craig	Schaugaard	Utah Division of Wildlife Resources	1594 W North Temple, Suite 2110	Salt Lake City	UT	84114
20	Individual	Email (September 2009)	Bryan	Dixon		10 Heritage Cove	Logan	UT	84321
21	Business	Letter (September 2009)	Eve	Davies	HydroResources, PacifiCorp Energy	1407 W. North Temple Ste. 110	Salt Lake City	UT	84116

Table J-2. Comment codes

BATHTUB Model	BATH
Data analysis	DAAN
Data availability	DAAV
Editorial	EDIT
Impairment	IMP
Load Allocation	LOAL
Load analysis and assumptions	LOAN
Source Identification	SOID
Water Quality Endpoints	WQE
Monitoring Plan	MONP
Implementation Plan	IMPP

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	1	1	BATH	HDR has performed a technical evaluation of the draft TMDL document along with the supporting water quality data and the BATHTUB water quality model. The findings of our review suggest multiple issues with the data analyses and water quality modeling performed for the draft TMDL. There appear to be critical flaws in the draft TMDL and the conclusions made.	Comment noted.	None.
B	1	2	IMP	Comment No. 1. It is not clear that there is water quality impairment of Cutler Reservoir based on the available information. Supporting Information: Understanding the water quality problems is imperative to the purpose of the total maximum daily load (TMDL) and developing appropriate actions to implement. It is not clear that there is a water quality impairment in Cutler Reservoir based on the available information. The draft TMDL states, "The impairment assessment (Chapter 3) found that the beneficial uses in Middle Bear River itself are not impaired…" (Section 6.2), and "…only the warm water game fishery designated use was listed as impaired by the State of Utah (UDWQ 2006)" (Section 3.4) for Cutler Reservoir resulting in a listing of partially supporting the beneficial use. For both the Middle Bear River and Cutler, the State of Utah has assigned the following beneficial uses: • 2B – Protected for secondary contact recreation such as boating, wading, or similar uses. • 3B – Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain. • 3D – Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain. • 4 – Protected for agricultural uses including irrigation of crops and stock watering. Cutler Reservoir was added to the state's 303(d) list for the first time based on Utah's 305(b) 2006 Integrated Report Volume I. The waterbody was not listed as impaired in the previous years' reports.	The Middle Bear River is listed on the 2006 305(b) report in category 4a (existing TMDL) as partially supporting the warm-water fishery beneficial use. The existing, current, TMDL for TP for the Bear River was approved on 10-23-1997 and identifies an instream concentration target of 0.05 mg/l. the Middle Bear River was found not to be in exceedance of the all life stage criteria for dissolved oxygen of 3 mg/l, based on diurnal dissolved oxygen monitoring from 2003 - 2007. However, the river exceeds the early life stage criteria of 5.0 mg/l 36% of the days for which diurnal data are available during the same period. For this reason, no additional nutrient reductions have been identified in the TMDL, beyond those required under the existing Bear River TMDL which are also necessary to reduce the impact of Bear River on the Cutler Reservoir system. DWQ acknowledges that the TMDL status of the Middle Bear River has not been clearly explained in the draft TMDL. Dissolved oxygen monitoring within Cutler Reservoir demonstrate exceedances of the 1-day water quality standard for dissolved oxygen of 3.0 mg/l for all life stages and 5.0 mg/l for early life stages of 15% and 25% respectively. The warm-water fishery use (3B) for Cutler Reservoir was first listed as impaired on the 2004 303(d) list of impaired waters for dissolved oxygen associated with high total phosphorus loads. It remained on the 2006 303(d) list as impaired.	The status of Middle Bear River is clarified in the Final TMDL to reflect the 10-23-1997 TMDL that applies to the Bear River. All sections referring to the Cutler Reservoir impairment are revised to reflect that Cutler Reservoir is on both the 2004 and 2006 303(d) lists of impaired waters.
B	1	3	IMP	Comment No. 2. Fisheries data and studies suggest that the beneficial use of Cutler Reservoir may not be impaired. Supporting Information The draft TMDL reports that "…additional lines of evidence were used to further assess impairment of Designated Beneficial Uses (DBU)" (Section 3.3). However, additional lines of evidence were not used to further assess impairment. Fisheries studies from USU (2006 and 2007) suggest that there is a sustainable warm water fishery.	In accordance with EPA guidance (Consolidated Assessment and Listing Methodology: Toward a Compendium of Best Practices, First Edition, USEPA 2002), assessment of impairment with biological data should quantify "the difference between reference or expected conditions of aquatic communities and those found at a specific site being evaluated." Reference conditions serve as the "benchmark of biological integrity against which a waterbody's conditions are compared." Where a reference condition can not be established, EPA recommends that a "disturbance gradient be constructed to extrapolate to an appropriate reference condition." Although the USU Fisheries Report for Cutler Reservoir (Budy et al. 2007) compares fish metrics to other systems, it does not compare the observed fishery data in the reservoir to an established reference condition. EPA guidance (2002) also identifies the following metrics for fishery data for use in assessing biological condition: native taxa richness, morphological composition, habitat preference composition, genetic diversity, salmonid guilds, temperature guilds, specialized spawners, specialized feeders, biomass, abundance, migration, anadromous spawning, top carnivore support, morbidity, and tissue contamination. Furthermore, when used in assessment of impairment, these metrics should be recorded over time to document trends in the biological community and/or compared to a reference or expected condition. The USU Fisheries Report quantifies several of these metrics and sets up a baseline for future fisheries studies in the reservoir to assess trends; however, the USU report itself can not be used to identify trends in the biological community or to determine impairment. Finally, to use biological criteria for impairment determinations, states must first establish thresholds marking the criteria "above which the waterbody is considered to be in attainment." The State of Utah has not established biological criteria specific to fish. The first biological criteria used by Utah in impairment determinations refer to macroinvertebrate assemblages in streams and are being incorporated into the 2008 Integrated Report by UDWQ. In addition, EPA also requires that states apply the "Policy of independent applicability" with respect to conflicting data for impairment determinations. The observed dissolved oxygen exceedances of water quality standards in Cutler Reservoir establish the impairment. The USU fishery study was used to document species present in the reservoir and to compare spawning seasons for those species with observed low dissolved oxygen periods in the reservoir. This serves as an additional line of evidence for impairment but does not supersede the primary	The monitoring plan developed for the final phased Cutler Reservoir TMDL includes follow-up fisheries studies that can be used in the future to assess trends in the biological community. The monitoring plan also incorporates macroinvertebrate sampling to assess the status and trends of other aquatic life in the warm-water fish and avian food chains in Cutler Reservoir. DWQ is exploring additional biological criteria appropriate for waters in Utah.

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
					determination of impairment based on observed exceedances of water quality standards. Low dissolved oxygen is most likely to affect juvenile fish in Cutler Reservoir. The USU Fisheries report notes that "In Cutler Reservoir, both length-frequency assessment and PSD values indicate that recruitment was poor for walleye and green sunfish" (Budy et al. 2007, p. 22). The report also notes that the reservoir is dominated by species that are moderately tolerant to tolerant of degraded water quality and that species that are intolerant to degraded water quality are either absent or present in very low numbers (see Table 2 in Budy et al. 2007). DWQ did not find any reference to a sustainable fishery in the report.	
B	1	4	IMP	Comment No. 3. The linkage of phosphorus to the listed impairment of low dissolved oxygen concentrations has not been demonstrated. Supporting Information: The draft TMDL states that "A loading analysis is required for each pollutant of concern, but some listed impairments (e.g., low DO) result from other pollutants (e.g., nutrients) that cause excess algal growth. In these cases a list of impairments will be addressed by the loading analysis of its associated pollutant," (Section 1.4.2). However, the draft TMDL also states that "A quantitative linkage between low DO and total phosphorus could not be drawn for Cutler Reservoir during this TMDL study due to the unique nature of the reservoir's internal processes and because chlorophyll a and total phosphorus sampling dates could not be paired with diurnal DO data," (Section 6.1). In summary, the connection between total phosphorus concentration and dissolved oxygen conditions has not been established.	Although the linkage between nutrients and low DO is not quantified for Cutler Reservoir, the connection between these two parameters has been established using the literature and a weight of evidence approach for data available for the reservoir. The linkage between nutrients, algal growth, and diurnal fluctuations of oxygen resulting in low nocturnal dissolved oxygen is well established in the literature and is supported by observations in Cutler Reservoir. The diurnal pattern of dissolved oxygen in Cutler Reservoir is a clear indication of nighttime respiration and daytime photosynthesis. This pattern occurs in both the open water and littoral areas of the reservoir. EPA does not require a quantitative linkage analysis between nutrients and dissolved oxygen in order to establish water quality endpoints in a phased TMDL. EPA guidance states that a phased TMDL approach is appropriate for "situations where available data only allow for estimates of necessary load reductions or for non-traditional problems where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty." However, even under a phased TMDL, load calculations must be calculated to not only improve water quality but to meet water quality standards based on available information. The endpoints identified for the phased TMDL are not excessively low. The total phosphorus endpoints of 0.07 and 0.09 mg/l, based on several lines of evidence, are 2.3 and 3 times the recommended nutrient criteria for lakes (0.03 mg/l) or rivers (0.029 mg/l) for the Central Basin and Range Subecoregion, as recommended by EPA (http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/lakes/lakes_3.pdf and http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers_3.pdf). DWQ is confident that these endpoints will result in attainment of the state's narrative criteria related to algae and the numerical dissolved oxygen water quality standard. Other endpoints related to sediment oxygen demand and organic matter loading may be required in future phases of the TMDL.	A more robust linkage discussion based on the limnological literature is included in the final Cutler Reservoir TMDL. The monitoring plan developed to accompany the Final TMDL includes future studies to help quantify the linkage between TP and DO. DWQ is pursuing an adaptive implementation plan for the Cutler Reservoir TMDL. Paired with further monitoring of the reservoir, this will allow DWQ to quantify the impacts of nutrient load reductions to multiple components of the Cutler Reservoir system.
B	1	5a	IMP	Comment No. 4. The linkage of chlorophyll a to the listed impairment of low dissolved oxygen concentrations has not been demonstrated. Supporting Information: There is not a clear separation of the potential threats and existing conditions in Cutler Reservoir.	The linkage between chlorophyll a and low dissolved oxygen is established through the diurnal dissolved oxygen patterns observed in the open water sections of Cutler Reservoir (see response to Comment B-1-4). The TAC asked DWQ to develop visual linkage diagrams explaining the connection between nutrients and beneficial uses for the Cutler Reservoir TMDL. One of these diagrams, Figure F-17, visually summarizes data availability for the Cutler Reservoir system.	More explicit discussion of this linkage is included in the Final TMDL.
B	1	5b	IMP	Comment No. 4. The linkage of chlorophyll a to the listed impairment of low dissolved oxygen concentrations has not been demonstrated. Supporting Information: For example, "…the threat of blue-green algal blooms is real for Cutler Reservoir… (Section 3.3.3.5)," yet "…no reports of toxic cyanobacteria blooms in Cutler Reservoir have emerged (Section 3.3.3.3 and 6.2.2.3)." Table I-6-5 entitled Summary of Individual Lake Beneficial Use Support from the 305(b) Assessment indicates that no Cyanophyta are present (UDEQ, 2006).	Additional evaluation of the linkages between nutrients and the ecology of the Cutler Reservoir system were explored at the request and direction of the Technical Advisory Committee. Among the concerns explored was the threat of blue-green algal blooms and the impact these species would have on recreational and aquatic life uses. The presence of two species of cyanophyta has been documented in Cutler Reservoir (STORET database data reported by Rushforth and Rushforth (2005)). See Table 3.33.	The 2008 305(b) report will incorporate the presence of cyanophyta in Cutler Reservoir.
B	1	5c	IMP	Comment No. 4. The linkage of chlorophyll a to the listed impairment of low dissolved oxygen concentrations has not been demonstrated. Supporting Information: As discussed in Section 6.2.2.2 of the draft TMDL, the chlorophyll a criteria are compared to waterbodies that are much deeper than the average depth of 3 feet shown in Section 5.2.1.1. One of the primary indicators suggested for determining water quality conditions, Chlorophyll a, has mostly been measured at low concentrations. "Of the chlorophyll a data collected in Cutler Reservoir and Middle Bear River, 28% and 21% respectively exceed 30 ug/L" (Section 3.3.1.3).	Cutler Reservoir is not a homogenous system. Water chemistry, vegetation and flow conditions vary widely throughout the reservoir. Due to this variation, data collected at discrete locations cannot necessarily be composited. In order to better represent the open water portions of the reservoir, those data collected in the slack-water areas were not included in the data sets used to determine typical water quality conditions in the open water section of Cutler Reservoir. Very high concentrations of chlorophyll a were recorded during supplemental monitoring (554 ug/l and 1,262 ug/l) of Cutler Reservoir in 2004. Sampling field notes and personal communication with the samplers (Tonya Dombrowski personal communication with Erica Gaddis February 25, 2009) indicate that these values represent chlorophyll a conditions in Clay Slough during algal bloom periods. These	Samples collected from Clay Slough for chlorophyll a analysis are discussed and the results presented in the Final TMDL. The Final TMDL also indicates that the elevated chlorophyll a results from Clay Slough are assumed to be representative of conditions occurring in the littoral areas of the reservoir during algal blooms and that additional monitoring is required to better characterize the magnitude of algal blooms throughout the reservoir. The Final TMDL is further clarified such that water quality endpoints apply to the open water areas of the

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					data indicate severe eutrophication in littoral areas of the reservoir that do not flush very frequently. Literature studies and data collected in other systems with similar characteristics demonstrate conclusively that algal blooms of this intensity, occurring in areas of shallow water and poor circulation consistently result in oxygen depletion.. While removing data collected in slack-water sections of the reservoir from the general analysis of water quality provides a more accurate assessment of conditions in the open water sections of the reservoir, it should also be recognized that concentrating the water quality analysis on just these sections also necessarily biases the analysis toward those areas of the reservoir with better water quality. The sampling and analysis of water quality in Cutler Reservoir presented in the draft TMDL does not include the elevated chlorophyll a concentrations observed in Clay Slough and is therefore biased towards those areas of the reservoir experiencing better water quality. This approach does not result in a calculated average chlorophyll a concentration that is higher than the average actually occurring throughout the reservoir.	reservoir and are not expected to result in attainment of all water quality standards in the littoral portions of the reservoir. Future monitoring will be used to determine the relative contribution of algal blooms, macrophytes, and SOD on the littoral zones of the reservoir.
B	1	5d	IMP	Comment No. 4. The linkage of chlorophyll a to the listed impairment of low dissolved oxygen concentrations has not been demonstrated. Supporting Information: Additionally the "available data are not pheophytin-corrected" (Section 3.2.5.5).	The supplemental chlorophyll *a* data collected in the summer of 2004 was pheophytin corrected but was not noted as such in the draft TMDL. While there are some differences observed in a cursory comparison of corrected and uncorrected chlorophyll a data for Cutler Reservoir, the differences do not yield significantly different outcomes in the identification of TMDL endpoints or water quality objectives.	The pheophytin corrected data are identified and presented separately in the document. A comparison between corrected and uncorrected data was presented in the revised TMDL.
B	1	6	IMP	Comment No. 5. Cutler Reservoir appears to have sufficient primary and secondary production to sustain the current fishery. Supporting Information: Existing fishery studies and reports on the reservoir conditions indicate that the fishery is not impaired (USU, 2006 and 2007). On-going studies by Utah State University will provide additional data about the status of the reservoir. Dissolved oxygen is occasionally above saturation, but as the author indicated, these are not generally a problem as total dissolved gases are usually at or below 100 percent (USU, 2006 and 2007). The lower dissolved oxygen values, measured during the summer, are not detrimental when considering the species composition in the reservoir.	DWQ recognizes that food resources are not limiting the fishery beneficial use in Cutler Reservoir. However, Figure 3.9 indicates that the reproductive season of many of the fish species present in the reservoir overlaps with observed exceedances of dissolved oxygen water quality criteria. The water quality standards for a warm-water fishery are appropriate for the fish species found in Cutler Reservoir. Both channel catfish and largemouth bass are present in Cutler Reservoir and are listed as warm-water species that are sensitive to low dissolved oxygen in the EPA Gold Book. The EPA Gold Book provides the original justification for the standards adopted by the State of Utah. See also response to Comment B-1-3.	No change.
B	1	7	DAAN	Comment No. 6. The current water quality standard may not have been applied correctly to the available data. Supporting Information: Table 1 from Utah's Rule R17-2 Standards of Quality for Waters of the State has the dissolved oxygen standard as a 1-day average (Utah, 2009) and not a 1-day minimum as used in the draft TMDL. The draft TMDL includes a more stringent minimum rather than the average calculation as stated in the current rule. Inconsistencies appear in the draft TMDL related to the dissolved oxygen data. The draft TMDL states, "In the assessment of impairment discussed later in this document, available depth-integrated instantaneous dissolved oxygen data were compared with state warm water game fish criteria of a minimum of 5.0 mg/L (as a 1-day average when early life stages are present) and a minimum of 3.0 mg/L (as a 1-day minimum when early life stages are not present). In total, data were collected at 14 stations around Cutler Reservoir on six different sampling events between 2003 and 2007" (Section 3.2.5.3). However, later in the draft TMDL the following is reported, "Because the DO impairment (related to algal growth) has been isolated to the summer algal growth season (May–October), percent exceedance estimates are only presented for the summer season" (Section 5.4.2).	The state water quality standard was correctly applied. The 1-day dissolved oxygen standard was found to be in error in the State water quality standards during the Cutler TMDL process. The standard was derived from the EPA Gold Book (http://www.epa.gov/waterscience/criteria/library/goldbook.pdf) and should read 1-day minimum rather than 1-day average. The Water Quality Board recently adopted this correction into the Utah State Rules through the Water Quality Standards Triennial Review (http://www.waterquality.utah.gov/WQS/20080715_Dissolved_Oxygen_Wording.pdf) which are effective as of 1/12/2009 (http://www.rules.utah.gov/publicat/bulletin/2008/20080715/31650.htm).	In the Final TMDL, the following sentence was revised: "In the assessment of impairment discussed later in this document, available depth-integrated instantaneous dissolved oxygen data were compared with state warm water game fish criteria of a minimum of 5.0 mg/l (as a 1-day average when early life stages are present)". The revised sentence will read: "In the assessment of impairment discussed later in this document, available dissolved oxygen data are compared with state warm water game fish criteria of a minimum of 5.0 mg/l (as a 1-day minimum when early life stages are present)"

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B	1	8	LOAN	Comment No. 7. The draft TMDL applies overly conservative assumptions for assessing the reservoir. Supporting Information: Developing a TMDL based on the worst drought conditions (an implicit margin of safety) together with including an explicit margin of safety may result in unwarranted and excessively low allocations. Section 3.2.3.2 of the draft TMDL discusses the temporal range of available nutrient data. Based on verbiage in the draft TMDL, "It should be noted that much of the data from the early 1990s through 2004 were collected under moderate to extreme drought conditions. Physical water quality characteristics (e.g., temperature and DO concentrations) measured during these water years will be representative of critical watershed conditions, as drought generally exacerbates impaired conditions within the watershed. The current period of record defined for this draft TMDL is 1995 to 2006. Data from the current period of record will be the primary source of information used to develop pollutant loading calculations and coefficients, determine the support level of beneficial uses, and define appropriate endpoints or thresholds for the Middle Bear River and Cutler Reservoir systems" (Section 3.2.3.2). The paragraph indicates that water quality data from potentially the worst possible conditions, an extended drought, were used to develop the TMDL.	The period of study used for this TMDL is representative of wet and dry climate conditions. Dry conditions, defined as 50% of the 30 year average, occurred during 3 of the 11 years used in the period of study for the TMDL. Overall, the combined average flow for the years used in the period of study was 82% of the 30-year average with a maximum of 163% flow in 1998. There is no discussion of drought in the margin of safety discussion. As the water quality concerns identified for Cutler Reservoir are those that will be exacerbated by drought conditions, it is prudent to include drought condition data in the analysis to ensure that the TMDL objectives will be protective of water quality were these conditions to reoccur during the lifetime of the TMDL.	Clarification regarding wet and dry years during the period of study is included in the Final TMDL.
B	1	9	EDIT	Comment No. 8. The monitoring stations are listed in the draft TMDL. However, the table references listed in Section 3.2 as Table 3.6, Table 3.7, and Table 3.8 appears to be incorrect and should be Table 3.6, Table 3.9, and Table 3.10.	Table reference error has been noted.	Table numbers were corrected in the text for the final TMDL.
B	1	10	DAAN	Comment No. 9. The spatial distribution of the water quality monitoring stations does not appear sufficient for either correlating reservoir conditions to inflows or for water quality modeling. Supporting Information: The draft TMDL includes the unsubstantiated statement, "Cumulatively, these monitoring stations represent adequate spatial coverage throughout the watershed" (Section 3.2.3.1). There are only four Cutler Reservoir in-lake monitoring locations. Of these four, three were deemed critical. The southern most monitoring station is north of the Benson Marina Bridge and "represents the water quality in the reservoir at the division between the southern end of the reservoir and the northern portions of the reservoir" (Section 3.2.3.1). This location is not centrally located in the southern portion of the reservoir. Segments 4 and 5 for the southern end of the reservoir model have no associated monitoring stations. The station at the confluence of Clay Slough has "the most robust dataset available" yet is noted that it "may experience some bias from pollutant loading from Clay Slough" (Section 3.2.3.1). The Benson Marina Bridge monitoring station is located north of a road that divides the reservoir. The only connection is a bridge opening of approximately 120 feet. It is also cut-off by a railroad embankment with the only connection being a bridge opening of approximately 210 feet. See Figure 1. The coloration of the aerial photograph in Figure 1 suggests potential differences in water circulation and water quality between the areas. The draft TMDL states, "As detailed in Table 3.10, some monitoring locations have consistent data throughout this time period, although others have experienced only intermittent or single-year or single-event data collection" (Section 3.2.3.2). Neither Table 3.10 nor Appendix B provides this level of detailed information. Table 3.10 only provides an "X" if one or more samples were collected during the year with no indication of the constituent, timing or number of samples.	The TMDL uses the data at Benson Marina Bridge, as described, to characterize water quality as water flows from the southern reservoir to the northern reservoir. This dataset is critical in the calculation of phosphorus mass balances for the Southern Reservoir. The lack of additional phosphorus monitoring data for the Southern Reservoir contributed to the decision to group the reservoir into 2 (rather than 5) segments for management purposes, including identification of water quality endpoints. In general, routine water quality sampling in Cutler Reservoir is biased towards the open water limnetic areas. DWQ agrees that additional water quality monitoring in the littoral parts of the Southern Reservoir may indicate water quality that is more degraded than that observed at Benson Marina. Four monitoring locations in the Southern Reservoir were included in the diurnal dissolved oxygen study, in addition to the mouths of tributaries in the Southern Reservoir (Swift Slough, Little Bear River, Logan River, and Spring Creek). The TAC agreed that all data used in the TMDL would be provided in electronic format rather than as an appendix to the TMDL. The data were made available with the release of the public draft TMDL on DWQ's website. While it is intended that loading analyses be a quantitative assessment of pollutant loads, federal regulations allow that 'loads may be expressed as mass per unit time, toxicity, or other appropriate measures' (40 CFR 130.2(I), emphasis added). In many cases, less data will be available than may be considered optimal for loading analysis. This cannot delay TMDL development. Federal regulations also acknowledge that 'load allocations are best estimates of the loading, which may vary from reasonably accurate estimates to gross allotments' (40 CFR 130.2(g)).	The revised TMDL separates data summaries for the Southern and Northern sections of the reservoir as well as for the littoral (near shore) and limnetic (open water) areas in the reservoir. Additional monitoring sites for the Southern Reservoir, especially in littoral areas, were added to the monitoring plan that will accompany the Final TMDL. A map of diurnal monitoring locations is included in the Final TMDL.
B	1	11	DAAN	Comment No. 9.01 The location of water quality monitoring stations does not appear representative of the surrounding waterbody as assumed for the analysis and water quality modeling. Supporting Information: The monitoring locations are shown in Figure 2. Some of the monitoring locations did not have either phosphorus or dissolved oxygen data. The monitoring locations with phosphorus and dissolved oxygen data are shown as larger circles and were compared to waterbody segments. The waterbody segment boundaries were generally confluences or narrow sections of the waterbody. Each waterbody was assigned a color code rating based on the distance to the nearest water quality monitoring locations. If there is a monitoring location with data within and generally representative of the water, the waterbody was color coded blue. If the monitoring location is somewhat representative, it was color coded purple. If none of the monitoring locations provide good representation of the waterbody, it was color coded yellow. As shown in Figure 2, there are significant areas that are poorly represented by the monitoring locations.	All of the sites used in the Cutler Reservoir TMDL have total phosphorus data for the current period of study (1995 – 2006). The number of total phosphorus (TP), dissolved P (DP), and ortho-P (OP) results for each site during this period are as follows: <u>Cutler Reservoir Sites</u> Cutler Reservoir above Dam (Segment 1): TP=16, DP=16, OP=0 Cutler Reservoir East of Hwy Bridge (Segment 2): TP=25, DP=21, OP=9 Cutler Reservoir at Confluence with Clay Slough (Segment 3): TP=80, DP=19, OP=13 Cutler Reservoir at Benson Marina (Segment 4): TP=48, DP=20, OP=24 <u>Tributary Sites</u> Clay Slough: TP=27, DP=16, OP=3	A map of diurnal dissolved oxygen monitoring sites is included to the Final TMDL. The Final TMDL separates diurnal data into Northern and Southern reservoir segments for presentation. This helps to narrow the focus on impairment which is more pronounced in the Southern part of the reservoir. Additional monitoring stations are included in the monitoring plan developed for the Final TMDL.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
					Little Bear River: TP=172, DP=149, OP=18 Logan River: TP=60, DP=39, OP=18 Newton Creek: TP=28, DP=28, OP=0 Spring Creek: TP=85, DP=64, OP=18 Swift Slough: TP=7,DP=6, OP=6 Diurnal dissolved oxygen data were collected in each of the five segments: Segment 1: East of Dam Segment 2: Cache Junction Segment 3: Clay Slough 2, Bear River 2 Segment 4: Benson Marina, Footbridge S of Marina, Pelican Island Segment 5: Valley View Tribs: Little Bear River, Logan River, Blue Springs Ditch, Swift Slough, Bear River 1, Clay Slough 1. DWQ considers this a robust dataset for use in a phased TMDL. See also response to B-1-10 regarding data available for TMDL process.	
B	1	12	DAAN	Comment No. 10. The temporal distribution of the data from the water quality monitoring stations does not appear sufficient for either correlating reservoir conditions to inflows or for water quality modeling. Supporting Information: The variation in monitoring intensity over the years and seasons is shown in Figure 3. The seasons were defined in the master dataset available from the Utah DEQ website as spring (March, April, May), summer (June, July, August), fall (September, October, November) and winter (December, January, February). Unfortunately, these do not overlap the summer (May through October) and winter (November through April) seasons defined in the draft TMDL. The y-axis shows the number of flow, phosphorus, and dissolved oxygen measurements throughout the watershed. While there is variation, samples were collected during every season of every year. The weekly variation is shown in Figure 4. The y-axis represents years of samples, the higher the bar the more years that samples were collected during that week. The samples are fairly evenly distributed among all weeks. The weeks that appear to have fewer samples are actually split between two seasons. Figures 3 and 4 provide some indication of the number and distribution of the samples. They do not fully show whether or not the samples were synoptic. A snapshot of water quality for the watershed with samples collected from the monitoring stations within a few days provides more information than random sampling. The number of flow, phosphorus and dissolved oxygen samples are shown in the pie charts in Figure 5. Stations, except those in the reservoir that did not have the three parameters sampled within one week of each other, are not shown. The figure shows where the most samples were collected. The draft TMDL included a concerned about whether there is a sufficient timeline of data to make conclusions. The draft TMDL states “Detailed algae and chlorophyll a data are not available at a robust level for Cutler Reservoir and the inflowing tributaries in a temporally coordinated dataset” (Section 3.2.5.5). Although the draft TMDL also includes the unsubstantiated statement, “In most cases, the Cutler Reservoir system has a complete set of available data for the evaluation of water quality impairment” (Section 3.2.6). The set of three figures (Figures 6, 7, and 8) shows the number of samples and the period of record from when those samples were collected. The size of the circle for the monitoring locations indicates the relative magnitude of the results with the range shown in the legend. The division of the range in the legend is divided at natural breakpoints in the datasets. The flow figure shows the most samples and highest flows in the Middle Bear River and the three tributaries to the south (Figure 6). The range of total phosphorus concentrations vary widely across the watershed (Figure 7). Dissolved oxygen concentrations are generally lowest in the reservoir (Figure 8).	The master dataset codes all data for several different temporal groups. As the commenter notes, seasons are one form of coding used in the master database. This grouping was used in the initial data exploration portion of the study; however this grouping was not used in the TMDL analysis as noted by the commenter. Spreadsheet column AS (titled Algal Season) in the master database codes all of the data for the two seasons used in the TMDL (May - October and November - April). All of the pivot tables used for data summary in the Master Database and presented in the TMDL document are based on Column AS in the master database. DWQ appreciates the visual representation of the temporal distribution of total phosphorus data in the Cutler Reservoir system. These graphs support the determination that a substantial amount of data has been collected from different locations and across different seasons, years, and hydrologic conditions in the Cutler Reservoir system. It is important to note that only data from 1995 through 2006 were used to characterize current conditions in the reservoir. Furthermore, DWQ believes that the quantity and quality of data is sufficient for this TMDL. DWQ agrees that additional chlorophyll a data would add to the TMDL analysis in the future. Additional sampling during algal blooms, rather than just random samples, would provide additional evidence for the eutrophic status of the reservoir. Although this information is desired, the chlorophyll a data available provides one line of evidence for impairment in the reservoir. These data are biased towards the open water areas of the reservoir and were collected at random and therefore may not capture the most significant algal blooms in the reservoir.	The temporal distribution of the data was presented in graphical and tabular format in the Final TMDL.
B	1	13	DAAN	Comment No. 11. Although no data, analyses or figures substantiates the assertion, the draft TMDL states that “…the STORET database indicated that DO sags had a high probability of occurring” (Section 3.3.1.4).	As indicated in section 3.3.1.4 and Table 3.38, the STORET database contains records of dissolved oxygen saturation values in excess of 100%. These data indicate, and published literature supports, a diurnal pattern of daytime photosynthesis followed by nighttime respiration and a resulting diurnal flux in dissolved oxygen. This hypothesis was tested in Cutler Reservoir through the deployment of data trolls throughout the reservoir on six occasions. The diurnal pattern and low dissolved oxygen values are recorded and documented in the TMDL.	No change.
B	1	14	DAAN	Comment No. 12. The level of QA/QC followed to ensure data credibility of field water quality samples is unknown, as there is no documentation of the procedures and protocols or referenced monitoring plans. Supporting Information: The amount of data scrubbing that was performed along with the number of	UDWQ followed the guidelines for use of the Trolls as provided by Insitu. Duplicate field samples were taken at random during deployment and retrieval to check accuracy.	Additional discussion regarding QA/QC methods, procedures, and the guidelines followed to collect and process diurnal D.O. data are provided in the Final TMDL report.

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				suspect data values in the post-treated dataset (Section 3.2.2) indicate potential QA/QC problems and questions about the credibility of the dataset.	DWQ recognizes that there are some anomalous patterns in the diurnal D.O. data sets. The only "data scrubbing" done in for the TMDL was based on field notes such as the pH cap being left on and the recorded start and stop times of the deployment of the trolls. The trolls were collecting data while not submerged for several minutes prior to and following the sample collection. Raw datasets are available for public review upon request to UDWQ. Data were also excluded where field notes indicated that the instrument had become clogged or tipped over into the mud.	Possible explanations for anomalous patterns in the diurnal data are discussed in the Final TMDL. These include: * weather related explanations for data peaks and valleys * local disturbances such as wind gusts, cloud bursts, boats, jet skis, anglers, etc. DWQ is exploring instrument related explanations for data drift observed at Valley View in August 2003 with the equipment manufacturer. The data will be excluded if an instrument calibration and/or drift issue is discovered.
B	1	15	DAAN	Comment No. 13. The quality protocols for the diurnal dissolved oxygen sampling are not documented and the data appears to drift from calibration when plotted, for example Figure 9. Supporting Information: Diurnal dissolved oxygen data were collected and provided the basis for the assessment of beneficial use support, yet there is no information on QA/QC, a QAPP, the procedures followed, the calibration of the instruments, where the instruments were deployed other than by name, or otherwise. Cache Junction and East of Dam by name and per appropriate USGS topographic map appear to be part of the northern reservoir not southern (Table 3.17). It is unclear where the stations are located as latitude/longitude information or station identification numbers are not provided.	UDWQ followed the guidelines for use of the Trolls as provided by Insitu. Duplicate field samples were taken at random during deployment and retrieval to check accuracy. The Troll 9000 was calibrated by DWQ prior to each deployment to the project area. The calibration date and time are included in the data file logged during each deployment. Note that the recommended calibration frequency (InSitu Troll 9000 User's Manual) indicates that: *"[For optical sensor technology, the] calibration frequency is more predictable than with electrochemical D.O. sensors, since the sensor does not drift appreciably and is not affected by fouling (except biofouling from organisms that generate or consume oxygen). If the foil is not mechanically damaged or moved, calibration can last a year or more."* An error in table formatting led to the Cache Junction and East of Dam Site being grouped into the Southern Reservoir group. Likewise the site South of Pelican Island should be in the Southern Reservoir.	Additional discussion regarding QA/QC methods, procedures, and the guidelines followed to collect and process diurnal D.O. data is provided in the Final TMDL. Additional discussion regarding calibration of the Troll 9000 (date, time, and procedures) is provided in the Final TMDL. A map of deployed trolls is included in the final TMDL. The error in Table 3.17 was corrected in the Final TMDL.
B	1	16	DAAN	Comment No. 14. The duration of the diurnal dissolved oxygen data is not long enough to calculate 7-day averages. Supporting Information: The instruments were not deployed for more than a week, so there is insufficient data for calculating the 7-day average, even though this was one of the goals of the dissolved oxygen monitoring (Section 3.3.1.4). Time series plots of the available dissolved oxygen collected from Cutler Reservoir are shown in Figure 10. Dissolved oxygen collected more frequently to provide diurnal data are shown for Benson Marina in Figure 11. However, the diurnal stations are only identified with a common name. Neither a station identification number nor a latitude and longitude are included in the spreadsheet. Therefore, it was impossible to relate these stations to the available long term dissolved oxygen data. While some of the diurnal data drops to low dissolved oxygen concentrations, these are at the end of the sample and could possibly be due to calibration drift of the instrument, fouling, or other instrument issues.	The TMDL notes that the dissolved oxygen criteria can not be used to assess the 7-day criteria. See page 71, Section 3.3.1.4 "A 7-day average DO of no less than 6 mg/L. Very few datasets extend for an entire week, so this assessment is intended to show general trends but not actual exceedances."	The goals outlined in Section 3.3.1.4 will be clarified to be consistent with the use of the diurnal data to assess trends over several days but not to calculate exceedances of the 7-day criteria. See also changes related to Comment B-1-15.

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B	1	17	DAAN	Comment No. 15. There is no clear correlation between dissolved oxygen concentrations in the reservoir and nutrient or algal concentrations. Supporting Information: Regression correlations were computed for two reservoirs stations (nearest and furthest from the dam) for dissolved oxygen to six constituents (Figures 12 and 13). The constituents were total phosphorus, orthophosphorus, total nitrogen, ammonia, uncorrected chlorophyll a, and turbidity. There is no strong relationship between any of these constituents and dissolved oxygen. None of the correlations resulted in a high r-squared correlation coefficient. However, the pairings in the correlations are weak due to the dataset. There are some duplicates in the data which were difficult to pair. There are multiple samples from the same time or approximate time that do not match the constituent sample times. There are samples from multiple depths; however, the depths are usually blank in the dataset. There are samples from different dates so a pair does not exist. The greatest problem with the correlation is the lack of information for the depth, which means sample pairings had to be assumed and all depths are included in the correlation. There could be a stronger correlation if only a single depth was used. However, that would be even fewer data points and a lower number of paired data for correlation. A correlation of dissolved oxygen to total phosphorus made by computing the ratio of the minimum and maximum values measured during a week and then averaged over the period of record is shown in Figure 14. The spatial distribution of correlation is also inclusive although some of the tributary stations around Cutler Reservoir show the greatest relationship.	As the commenter notes, there are insufficient pairs in the dataset to conduct regression analysis linking dissolved oxygen to TP and chlorophyll a. Dissolved oxygen values collected at the time of TP and Chl a sampling can not be used in a regression analysis because dissolved oxygen concentrations fluctuate throughout the day-night cycle and most of the DO data (outside of the diurnal DO study) were collected during mid-day or afternoon when oxygen concentrations are expected to be highest. Chlorophyll a concentrations also vary across days and weeks and can not be compared to oxygen data collected at a different time. Proper correlation of these parameters requires chlorophyll *a* data collected at the same time as diurnal dissolved oxygen data. See response to Comment B-1-4 regarding the linkage analysis and weight of evidence approach used in the TMDL.	See response to Comment B-1-4.
B	1	18	DAAN	Comment No. 16. The data provide no conclusive findings. Supporting Information: The data appear to be spatially insufficient and potentially temporally insufficient for thorough analysis and water quality modeling. This becomes apparent in the inability to form conclusions including “A quantitative linkage between low dissolved oxygen and total phosphorus could not be drawn for Cutler Reservoir during this TMDL study due to the unique nature of the reservoir’s internal processes and because chlorophyll a and total phosphorus sampling dates could not be paired with diurnal DO data” (Section 6.1).	See response to Comment B-1-4, B-1-10, B-1-11, and B-1-12.	See response to Comment B-1-4, B-1-10, B-1-11, and B-1-12.
B	1	19	DAAN	Comment No. 17. Watershed conditions are not adequately examined and related to reservoir water quality conditions. Supporting Information: A relationship between the water quality in the Middle Bear River and Cutler Reservoir is not clearly established. This is important to understanding the system, selecting appropriate implementation plans, and estimating how the system will respond to those plans. The Middle Bear River only partially supports its beneficial uses based on total phosphorus. Additionally, there appears to be a watershed problem since, “the very high relative densities of five periphyton species in Middle Bear River suggest eutrophic overgrowth in Middle Bear River” (Section 3.3.2.4). Without addressing this issue, changing the water quality in Cutler Reservoir may be impossible. Watershed and river issues also suggest that delivering additional loads to the existing internal load could be causing water quality issues in Cutler Reservoir.	The Middle Bear River is one of 7 major tributaries to the Cutler Reservoir system. Total phosphorus load from the Bear River is incorporated into the load analysis associated with the Northern section of Cutler Reservoir and is an input to the BATHTUB model. There is no water quality standard for total phosphorus in the State of Utah, however the existing Bear River TMDL identifies a concentration of 0.05 mg/l TP for the main stem of the Bear River. The Middle Bear River was found not to be in exceedance of the all life stage criteria for dissolved oxygen of 3.0 mg/l, based on diurnal dissolved oxygen monitoring from 2003 - 2007. However, the river exceeds the early life stage criteria of 5.0 mg/l 36% of the days for which diurnal data are available during the same period. For this reason no additional nutrient reductions have been identified beyond those already required under the existing TMDL. The load allocation in the draft TMDL for the Middle Bear River requires a 35% reduction in the summer and a 52% reduction in the winter. DWQ acknowledges that slightly more reductions on the Bear River are required to meet the total phosphorus endpoint of 0.05 mg/l throughout the year.	The load allocation identified for the Middle Bear River was adjusted down in order to be consistent with the existing TMDL on this segment of the river. This results in slight adjustments to load allocations elsewhere in the watershed.
B	1	20	SOID	Comment No. 18. Not all sources are identified in the draft TMDL. Supporting Information: Together with establishing the relationship between watershed, river, and reservoir water quality, a full accounting of all loadings to the reservoir is necessary. Additional sources not fully accounted for in the draft TMDL include various non-point and point sources. Section 4.1.4 of the draft TMDL mentions the existence of several pipe outlets that drain to the reservoir and then states “The source of these pipes is unknown but could include field drains from agricultural fields, potentially illicit discharges of septic systems, drainages from barnyard areas, and/or return irrigation flow” (Section 2.1.2.1). The irrigation canals and flow diversions make this system very hydraulically complex and it does not appear that this complexity has been evaluated or is understood. Without an understanding of the water balance, the water quality loadings are broadbrush and may not be appropriately assigned. The identified non-point sources (Section 4.1), including stormwater, septic systems, and bank erosion, are lumped together in the land use loading analysis (Section 4.2.8 and 4.3). These non-point sources are discussed but not examined further. For example, while AFO/CAFO loads are estimated in Section 4.2.7, loads from septic systems are not. There are two known State permitted land application sites, Gossner Foods and Galloway, located near Cutler Reservoir that are sources and were ignored.	Watershed loads from tributaries to Cutler Reservoir are calculated based on monitoring data and/or studies conducted as part of other TMDLs. All significant loads to the reservoir are accounted for in one of the currently identified groups. Total load to the Northern Reservoir is calculated at Benson Marina based on a water balance for the Southern Reservoir and TP data at Benson Marina. The categories and methodologies used in the Source Identification were approved by the Technical Advisory Committee prior to undertaking that portion of the study. The grouping of nonpoint sources by landuse within each watershed provides an overall estimation of load from each landuse. Identification of the most cost-effective projects for source reductions within each nonpoint source landuse group will be watershed specific and are best dealt with by local watershed coordinators and land managers within each watershed. Loads associated with the pipe outlets to the reservoir are captured in the category Internal/Unknown load. Septic system loads are incorporated in the urban/developed nonpoint source loads. The estimated load from the irrigation canals are based on the best available	Additional hydrologic and water quality monitoring for the irrigation canals will be explored for the monitoring program designed to accompany this phased TMDL. The monitoring plan will balance cost with data requirements needed to improve TMDL estimates. The two permitted land application sites in the watershed are included to the Source Identification section of the TMDL.

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					information (from UACD) for the area and include crop type, irrigation practices, and water supply to the irrigated pasture land. Additional analysis of the water budget would require detailed hydrologic data from canals throughout the area and is not warranted at this point in the TMDL process.	
B	1	21	LOAL	Comment No. 19. Land uses and identified sources are not linked and instead lumped by watershed. Supporting Information: The land use loading analysis was performed by USU using the model TOPNET. The model uses phosphorus load coefficients by land use for the analysis. The resulting summary loads tables have non-point sources categorized by ditches, AFO/CAFO, background, agriculture, developed, and other. This method does not provide a connection between the identified non-point sources and phosphorus loads. There also appears to be some disconnect between the loads estimated in other TMDLs and those estimated from land use. For the load allocations, the non-point source loads are lumped by watershed. The identified non-point sources are not connected to the loads or allocations, which may cause difficulty in implementation assignments and accounting. For example, a reduction in septic system loading could potentially be greater than the estimated load and multiple categories could attempt to take credit. The loading from non-point sources does not appear to have carried through the analysis to reach an estimate of their contribution to the loading to Cutler Reservoir. The lumped approach may have an appropriate total loading but there is insufficient information to evaluate the non-point source components.	The grouping of nonpoint sources by watershed was agreed upon by the Technical Advisory Committee prior to conducting the Source Identification portion of the study. Area weighted load coefficients are used to calculate total phosphorus load by multiplying them by the area of each landuse in each subdrainage. Nonpoint source loads estimated with this method are then adjusted proportionally to match monitored load from each tributary. The USU model was only used to determine the proportion of the load calculated with monitoring data that could be apportioned to each landuse in a subdrainage. Identified nonpoint source load reductions are intended to guide nonpoint source implementation. Total nonpoint source reductions implemented can be accounted for in total during the implementation phase of the TMDL.	No change.
B	1	22	BATH/DAAN	Comment No. 20. The N:P ratios are based on dissolved instead of total N:P and indicate the reservoir is nitrogen limited (or nitrogen controls the water quality conditions and not phosphorus). Supporting Information: The connection between nutrients and organic matter appears to have some contradictory information. Section 3.3.2.3 of the draft TMDL describes the N:P ratios found in Cutler Reservoir. N:P ratios reported for the reservoir range from a reported average of 2.06 in the southern end of the reservoir to 3.25 in the northern end. The well-documented typical planktonic biomass ratio of N:P in a system is 16:1. This ratio is known as the Redfield ratio for scientific evidence first presented by Alfred Redfield in 1958. In a typical waterbody with a low N:P ratio, cyanobacteria would be the dominant species, but according to the data presented in the draft TMDL, that is not the case. Also, it was previously mentioned that the Secchi Depth data was indicative of poor water quality, which might lead one to conclude the system is light limited. Table 3.32 which accompanies Section 3.3.2.3 shows N:P ratios that are very low. If these ratios are correct, then the algal community seemingly is nitrogen starved. In addition the draft TMDL states, "The N:P data show a high degree of spatial and temporal variability, and suggest that Cutler Reservoir is generally co-limited by nitrogen and phosphorus, with a tendency toward nitrogen limitation." While total phosphorus concentrations are above Utah's indicator levels, modifying total phosphorus concentrations in this system may result in an unfavorable response because of its N:P ratio.	N:P ratios in Cutler Reservoir range from very low (less than 1) to 14. See discussion on N:P ratios in Section 3.1.1.1. The Redfield Ratio (discussed in the same section) indicates the threshold above which a system is almost entirely phosphorus limited. N:P ratios between 7 and 15 indicate a co-limited system. Systems are only considered to be predominantly nitrogen limited at ratios less than 7. The N:P ratios in Cutler Reservoir vary between nitrogen, phosphorus, and co-limitation at different sites and during different times of the year. Nutrient bioassays conducted by USU also indicate co-limitation. Generally, a phosphate concentration of 0.01 mg/L will support plankton, whereas concentrations of 0.03 to 0.1 mg/L phosphate or higher will likely trigger blooms (EPA 1986; Dunne and Leopold 1978). A high availability of phosphorus does not always indicate continued production because the system may become nitrogen limited. Regardless of which nutrient is currently limiting algal growth in the reservoir, the system can be pushed to a phosphorus limited system through reduction of phosphorus. This is preferable to a nitrogen or co-limited system because it reduces the likelihood of blue-green algal blooms. As the commenter notes, the low N:P ratios observed on some occasions in Cutler Reservoir could indicate that the system is close to a tipping point that would result in a blue-green algae dominated system. Prevention of this condition requires phosphorus reduction Light limitation of the system is also recognized in the TMDL (see Sections 3.3.2.2 and 3.1.2.4) and was included as a factor in the original BATHTUB model. The revised model will not include prediction of chlorophyll a. It is not clear what the commenter intended to convey with the statement "… modifying total phosphorus concentrations in this system may result in an unfavorable response because of its N:P ratio." It is widely accepted that phosphorus concentration reductions result in desirable conditions including the limitation of algal growth, specifically of blue green algae.	Managing the system to be phosphorus limited is included as one line of evidence for the TP endpoint selected for the reservoir. The current nitrogen data in the reservoir will be used to estimate a dissolved P concentration that will result in an N:P ratio of 10 – 15. This provides an additional line of evidence to derive a TP appropriate for Cutler Reservoir in the Final TMDL.
B	1	23	BATH	Comment No. 21. The residence time of Cutler Reservoir is less than the range used to develop the BATHTUB model and therefore the application of the BATHTUB model to Cutler Reservoir is inappropriate. Supporting Information: The BATHTUB model is comprised of a series of empirical relationships derived from a collection of data for a number of lakes and reservoirs across the U.S. However, these empirical relationships start to breakdown when the waterbody being modeled has characteristics that are far outside the range used to create the relationships upon which BATHTUB is based. This is the case with the hydraulic residence time of Cutler Reservoir. Table 3 shows the residence time as	The computational core of the BATHTUB model consists of two components: 1. Mass balance calculation of total nutrient concentrations 2. Empirical calculation of eutrophication response variables DWQ recognizes that the residence time in the reservoir is less than that used in the calibration data set used to develop the empirical equations used to predict chlorophyll a. Although BATHTUB can be used outside the range of the calibration data set used in development, DWQ acknowledges that this adds uncertainty to the predictive power of the model. However, this residence time restriction does not apply to the first half of BATHTUB's calculation routines, which are used to calculate total	Chlorophyll a was not simulated using BATHTUB in the Final TMDL. Prediction of chlorophyll a using BATHTUB adds to the TMDL but is not necessary for the phased TMDL approach identified. The linkage between total phosphorus and algae as well as the linkage between algae and dissolved oxygen has been demonstrated and is strengthened in the water quality endpoints section of the TMDL. The total phosphorus endpoints identified for the TMDL are based on a weight of evidence approach

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				calculated by the BATHTUB model. From the BATHTUB Help Files "At extremely high turnover ratios and low nutrient residence times (<2 weeks), the variability of loading conditions within the averaging period (as attributed to storm events, etc.) would be increasingly reflected in the pool and outflow water quality measurements. In such cases, pool measurement variability may be relatively high, and the biological response (e.g., chlorophyll a production) may not be in equilibrium with ambient nutrient levels, particularly immediately following storm events" (USACE, 1999). At low residence such as Cutler Reservoir, the model output becomes highly variable and may not be representative. From the BATHTUB Help Files "Chlorophyll-a response to nutrients tends to be lower in reservoirs with flushing rates >~25/yr or hydraulic residence times <~14 days" (USACE, 1999). From the BATHTUB Help Files "Deviations at the other extremes (reservoirs with lower residence times or higher overflow rates than those represented in the model development data set) are of less concern because the sedimentation term is generally an insignificant portion of the total nutrient budget in such systems (i.e., predicted pool concentrations are highly insensitive to estimated sedimentation rate)" (USACE, 1999). Figure 15 illustrates mean depth and residence time (USACE, 1999). The residence times in Cutler Reservoir are all less than the residence times shown in Figure 15. Therefore, it is inappropriate to apply the BATHTUB model to this waterbody.	phosphorus and total nitrogen calculations. The BATHTUB documentation explicitly states that BATHTUB nutrient calculations are calculated using a mass balance framework: "The water balances are expressed as a system of simultaneous linear equations that are solved via matrix inversion to estimate the advective outflow from each model segment. The mass balances are expressed as a system of simultaneous nonlinear equations which are solved iteratively via Newton's Method (Burden, Faires, and Reynolds 1981). Mass-balance solutions can be obtained for up to three constituents (total phosphorus, total nitrogen, and a user-defined conservative substance). Total phosphorus and total nitrogen concentrations are subsequently input to the model network (Figure 2) to estimate eutrophication responses in each segment. Conservative substances (e.g., chloride, conductivity) can be modeled to verify water budgets and calibrate longitudinal dispersion rates." BATHTUB, however, allows the modeler complete control over specification of the sedimentation rate. As long as the sedimentation rate selected by the modeler is based upon site-specific conditions, the BATHTUB model can be run completely as a mass balance model to predict total phosphorus concentrations without any reliance on the empirical relationships.	that DWQ has found to be more than sufficient to move forward with the phased TMDL approach. Only total phosphorus was modeled with the BATHTUB model in the Final TMDL.
B	1	24	BATH	Comment No. 22. The BATHTUB model of Cutler Reservoir is sensitive to broadly estimated watershed loadings and predicts a large uncertainty in total phosphorus concentration. Supporting Information: Tables 4 and 5 show the results of sensitivity analyses of the Phosphorus Availability factor and Total Phosphorus Load Response, respectively. As shown in these tables, the BATHTUB model is much more responsive to changes in the loading than changes to insegment reaction calibration factors. Table 5 also shows that even by assuming a 50% uncertainty in watershed loading, the total phosphorus concentration in segments can have an uncertainty band anywhere from 50 µg/L to over 150 µg/L wide.	The load calculations used in the TMDL have a lower level of uncertainty associated with them than the uncertainty assumed by the commenter in running sensitivity analyses. Furthermore, calibration of the model to observed total phosphorus concentrations is a necessary step in any modeling process. DWQ recognizes that less calibration of a model is preferred.	All calibration parameters related to chlorophyll a prediction, including phosphorus availability, were disabled in the BATHTUB runs for the Final TMDL. The BATHTUB model was used solely for prediction of total phosphorus. Uncertainty in observed data in the reservoir is captured in the model but is displayed using box and whisker diagrams plotted against model predictions in the Final TMDL. Phosphorus decay rates were returned to default values in the revised BATHTUB model. Doing so results in a model that still falls within the range of observed data and does not require calibration. These changes do not result in changes to load reductions identified in the draft TMDL.
B	1	25	SOID	Comment No. 23. Irrigation return flows selected for the water quality modeling are not explained in the draft TMDL. Supporting Information: Section 4.2.10 of the draft TMDL states: "On irrigated fallow and pastureland it was assumed that the irrigation water efficiency rate was 35% and that therefore 65% of the water used for irrigation returned to the canal and was discharged to Cutler Reservoir." While these values are possible for irrigation water efficiency, there should be an agricultural study available to cite for a value specific to the irrigation practices occurring in the area. Due to the short residence times in the model segments, the BATHTUB model is more sensitive to advective flows than reactions within each segment. Therefore, the model results are sensitive to this value and it is important to the modeling framework and predictions.	Estimates come from local UACD staff that work with the landowners that use irrigation waters provided by the City of Logan. Local estimates of water usage are considered to be better than general information generated from the literature. DWQ is open to the commenter proposing an alternative method, in a timely manner, to estimate the load associated with this return flow using existing data and information.	Dispersion of phosphorus between segments was disabled in the BATHTUB model used in the Final TMDL leaving advective transport as the only mechanism by which phosphorus moves through the system. See also changes related to Comment B-1-26.
B	1	26	BATH	Comment No. 24. The longitudinal dispersion model was chosen to be a non-default value. The value that was chosen was user input (code 3). However, dispersion values were not changed nor were they used for calibration.	Comment noted.	Advective transport, rather than dispersion, is the primary means of phosphorus transport in Cutler Reservoir. DWQ recognizes that setting the longitudinal dispersion value to a non-default setting is not necessary. For this reason longitudinal dispersion will be disabled for the BATHTUB model used in the Final TMDL.
B	1	27	BATH	Comment No. 25. The BATHTUB model of Cutler Reservoir is incorrectly setup and the output incorrectly interpreted. Supporting Information: Tables 6.14 and 6.15 of the draft TMDL show an "Indicator of limiting nutrient (N:P)." The BATHTUB model is actually outputting the value: (Total Nitrogen minus 150)/Total Phosphorus ratio. This indicator value is computed within the BATHTUB model. Where low values of < 10-12 indicate nitrogen limitation and high values indicate phosphorus limitation. In Tables 6.14 and 6.15 of the draft TMDL, values in every segment for both summer and winter baseline model runs show low values indicating nitrogen limitation. As an experiment, the models were altered so that nitrogen was not computed. This yielded very different chlorophyll a values, as can be seen in Table 6. The text of the draft TMDL listing the observed water quality data describes the reservoir system as co-limited by	Comment noted.	See response to Comments B-1-23 and B-1-24.

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				N and P, but the model that was set up portrays a system that is completely N-limited. As stated previously, due to the short residence times in each segment in the BATHTUB model, the model is more sensitive to advective flows than reactions within each segment. This puts more emphasis on the loads from tributaries in calculating insegment concentrations. The loads from many of the tributaries are calculated from watershed loading coefficients. No uncertainty analysis was performed on any of these loading coefficients. Also, for Swift and Clay Sloughs, these loading coefficients were adjusted, although the background information is not provided.		
B	1	28	BATH	Comment No. 26. The BATHTUB model of Cutler Reservoir is predicting incorrect phosphorus values. Supporting Information: In the BATHTUB model runs for the draft TMDL reductions, the total phosphorus model results are less than the total phosphorus minus orthophosphorus (TP-PO4) model results. The TP-PO4 values are assumed, in the BATHTUB model, to be the organic phosphorus concentration. It is physically impossible for the organic phosphorus concentration to be larger than the total phosphorus concentration. These TMDL model scenarios should not be considered finalized until the model output is realistic and represents physically possible conditions. These results are shown in Table 7. In addition, the TP/PO4 ratios used in the tributary influent model are low. The ratios are more indicative of extremely clear, i.e. low suspended sediment. Phosphorus is more commonly attached to sediment particles than dissolved in an inorganic form in natural waters. Additionally, dissolved orthophosphorus is taken up quickly because it is, in most cases, the limiting nutrient.	Comment noted.	The revisions to model setup described in the response to comments B-1-23 and B-1-24 address this anomaly. The model was not used to predict orthophosphate in the Final TMDL.
B	1	29	BATH	Comment No. 27. Setting the chlorophyll a factor to zero is inappropriate for this waterbody, as the largest factor influencing chlorophyll a is the flushing, as discussed earlier. Supporting Information: The BATHTUB model coefficient for the chlorophyll a flushing term has globally been selected to zero. However, in Section 5.3.2 of the draft TMDL, it states that "In order to account for the slow moving water in the Southern Reservoir and the potential for stagnation throughout the reservoir during the summer season, the chlorophyll a flushing function was disabled for the Southern Reservoir". According to the BATHTUB model help files, "setting the Chl-a flushing term to zero will eliminate the influence of flushing rate on the predicted chlorophyll-a concentrations. This may be appropriate, for example, in situations where the reservoir is immediately downstream of another reservoir with a sufficient hydraulic residence time to allow algal populations to develop" (USACE, 1999).	The chlorophyll a flushing term was set to zero because of the constriction between the northern and southern reservoir.	Chlorophyll a was not simulated in the Final TMDL. Only total phosphorus was modeled with the BATHTUB model in the Final TMDL. See also response to Comments B-1-23 and B-1-24.
B	1	30	BATH	Comment No. 28. Availability factors for total phosphorus, orthophosphorus, total nitrogen, and inorganic nitrogen have been altered from default values without explanation.	Comment noted.	See response to Comments B-1-23 and B-1-24.
B	1	31	SOID	Comment No. 29. The discharge from Logan WWTP may not be appropriately characterized in the analysis and water quality modeling. Supporting Information: The calculations for Swift Slough and the flow from the Logan WWTP are not adequately described. There is a network of irrigation canals and flow diversions at the location at which the Logan WWTP discharges to Swift Slough at Outfall 002. This commingling of water sources has not been addressed adequately in the draft TMDL.	Flow from the Logan WWTP are based on data provided directly by the City of Logan for Outfall 002. Swift slough loads upstream of the wastewater treatment plan are characterized using TP collected by Logan City upstream of their outfall.	The Final TMDL will clarify the methodology used in calculating loads to Swift Slough.
B	1	32	BATH	Comment No. 30. The phosphorus decay rates and internal loading in the BATHTUB model are setup incorrectly. Supporting Information: Section 5.3.2 in the draft TMDL states, "Phosphorus decay rates in Segment 3 and the confluence of input from the Southern Reservoir and the Bear River were increased to account for the negative internal load (sink) for phosphorus and sediment in this segment during both seasons." The calibration factor of segment 3 is set to a value of 6, which the BATHTUB model help files suggest not changing (USACE, 1999). Also, it is unclear what the meaning of "phosphorus decay rates" is, because it is not obvious in the model. In addition, the internal loading value for phosphorus in segment 4 is not discussed at all. The text is unclear on whether the bottom sediments are a source or a sink or a net calculation was performed.	Comment noted. The methodology and results of phosphorus mass balance calculations are described in detail in Sections 4.2.11, 4.3.1.6, and 4.3.2.6 of the TMDL. The mass balance calculations indicate that Southern Reservoir is a net source and the Northern Reservoir a net sink of phosphorus.	The revised model setup for the Final TMDL (see response to comments B-1-23 and B-1-24) results in a model that does not require a calibrated adjustment to decay rates.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	1	33	BATH	Comment No. 31. Insufficient alternative scenarios were investigated with the BATHTUB model to bracket the potential influence of point sources such as Logan WWTP. Supporting Information: The BATHTUB models were altered and rerun to investigate additional scenarios. One set of model runs was created with the Logan WWTP concentration set to 90 µg/L, another set of model runs was created with the Logan WWTP concentration set to 0 µg/L, and another set of model runs was created with the nitrogen modeling in BATHTUB turned off and the chlorophyll a calculations set to phosphorus and light limitation only. As can be seen in Table 6, changing the Logan WWTP effluent concentration has little to no effect on chlorophyll a concentrations in the reservoir segments. But, by removing the nitrogen growth limitation, which is likely artificial, the chlorophyll a values increase greatly. The large effect on the model results from changing the growth limitation suggests additional investigation should be attempted to address the possible light limitation as discussed in Section 5.4.2 of the draft TMDL. If the light limitation is removed either by removing the bottom feeding fish or upstream sedimentation basins, the chlorophyll a concentrations could increase as much or more than the increase from removing the nitrogen limitation. There is no explanation of how the total phosphorus to chlorophyll a relationship was arrived at as described in Section 6.2.2.4 of the draft TMDL. As shown in Table 6, changing some tributary concentrations, such as the Logan WWTP has no effect. Yet the TMDL reduction runs of the BATHTUB model present a configuration of the model that claim to yield total phosphorus and chlorophyll a results that meet the set target endpoints. However there is no investigation or discussion about the possibility of other configurations also meeting the target endpoints.	The goal of this TMDL study is to present a realistic characterization and a feasible approach to restore the fisheries beneficial use in Cutler Reservoir. Addressing only one source of total phosphorus into Cutler Reservoir will not achieve the water quality endpoints as you've demonstrated for the Logan WWTP. To achieve success, all sources of phosphorus loading must be reduced including both point and nonpoint sources. Cutler Reservoir is a complicated and dynamic natural system, subject to many environmental variables. DWQ has made every effort to characterize and present this complexity within a context that is both understandable by its stakeholders and representative of reality. It is not practical to evaluate scenarios outside of reality (e.g. removal of light limitation).	See response to Comment B-1-23 and B-1-24.
B	1	34	LOAL	Comment No. 32. The load allocations did not consider all the factors necessary to developing an allocation that can actually be implemented. Supporting Information: The load reductions were calculated as the total load minus the allocated loads from other TMDLs and then evenly divided across all other sources (Section 6.6). An even distribution is one of the approaches identified by EPA for load allocations. EPA's Technical Support Document for Water Quality-based Toxics Control includes 19 allocation schemes. The selected allocation scheme should meet the anti-degradation provisions and other requirements of Utah's water quality standards. Additional factors to consider include: whether the allocations are technically feasible and economically viable to implement, similarity with allocation schemes used for nearby TMDLs, and the overall cost-effectiveness and equity and fairness. Consideration of these factors as part of the TMDL is helpful for framing the successful implementation of the TMDL. These factors do not appear to have been considered or reviewed.	Even distribution of load allocations was not found to result in unfair distribution of responsibility for water quality improvement between point and nonpoint sources. Nor were the load allocations found to result in a technically infeasible or economically unviable implementation. DWQ supports the most cost-effective implementation method available to attain each load allocation. This includes the possibility of load offsets associated with nonpoint source controls funded by point sources. Initial committee discussions related to load allocation favored an equitable distribution of reductions among all sources (personal communication between Tonya Dombrowski, ODEQ and Erica Gaddis, SWCA March 2009).	No change.
B	1	35	LOAL	Comment No. 33. The draft TMDL does not demonstrate that the load allocations will result in meeting the water quality standards. Supporting Information: Regardless of the allocation scheme, the TMDL reductions are to result in meeting water quality standards. This is not demonstrated in the draft TMDL because no relationship between watershed phosphorus and reservoir dissolved oxygen has been established. Also, the reservoir model does not simulate dissolved oxygen and thus simulated reductions in phosphorus cannot show if water quality standards are met. The allocations may not be appropriate because it has not been shown that water quality standards will be met. The equity of allocation is unknown because sufficient information has not been presented.	The water quality endpoints for total phosphorus identified for the TMDL are based on a weight of evidence approach. Based on the lines of evidence identified in the TMDL, dissolved oxygen endpoints are expected to be attained if the total phosphorus endpoints identified are achieved. DWQ recognizes the complexity of the Cutler Reservoir system and the uncertainty associated with this TMDL and has therefore selected a phased approach for the TMDL.	Additional lines of evidence are provided in the final TMDL, including a linkage between nutrients and algal growth, macrophytes, sediment oxygen demand, managing the system to be phosphorus limited, TMDL endpoints for other shallow systems (i.e. Snake River), literature support related to other shallow systems, and EPA nutrient criteria guidance. Chlorophyll a endpoints were removed from the Final TMDL.
B	2	1	IMP	We believe the Middle Bear River and Cutler Reservoir (BR/CR) TMDLs fail the "common sense" test regarding beneficial uses 3B (warm water fishery) and 3D (waterfowl and other water organisms) and should be rejected.	Comment noted.	
B	2	2	BATH	Modeling done for the TMDLs is insufficient and should be redone in a more defensible way.	See response to comment B-1-23, B-1-24, and B-1-26.	See response to comment B-1-23, B-1-24, and B-1-26.

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B	2	3	DAAN	The TMDLs, as currently written, should be rejected. The TMDLs use dissolved oxygen and phosphorus concentrations as indicators of the poor health of the BR/CR ecosystem. However, common sense says that these indicators should be trumped by direct measures if the direct measures show that the ecosystem is healthy. In fact, direct measures, such as the health of the fish population, the robustness of the bird population, human usage of reservoir and agricultural uses of the water, all show the ecosystem is healthy. Scientific data show that the ecosystem is healthy. The BR/CR fish study by Budy, Dahle, and Thiede (2007) stated that the fish population in the BR/CR ecosystem is "abundant, diverse and demonstrates a high overall biomass of fish." In other words, beneficial use 3B is supported. The bird population is also robust and diverse in that at least 72 species were counted in the ecosystem. The TMDLs state that these birds are not limited by habitat. Instead, the TMDL assessment of partial support of the beneficial use 3D relies on a literature-based food-resource inventory. That is weak evidence for nonsupport. No shortage or reason for a shortage of food for the birds was documented. Any possible shortage of food for birds may just as well be limited by the robust fish population eating many of the same foods. The TMDLs state that beneficial uses 2B (human secondary contact recreation such as boating and wading) and 4 (agriculture) are fully supported. We believe common sense and scientific data show that the BR/CR ecosystem fully supports all of its designated beneficial uses.	See response to Comment B-1-3.	See response to Comment B-1-3.
B	2	4	DAAN	In the December 2008 meeting of the BR/CR TMDLs Technical Advisory Committee, the majority of the committee voted to endorse TMDLs because "we have studied this for five years" and "there used to be more ducks around the lake than there are now." Fatigue or frustration with the time it takes to get a good product should not be considered good reason to move TMDLs forward. Regarding anecdotal duck populations, no historical bird counts or reason for bird population growth or decline are cited in the TMDLs. Perhaps ducks prefer other habitats as compared to those around the BR/CR as hydrologic and agricultural conditions change.	Comment noted.	None.
B	2	5	BATH	We are not skilled water quality modelers. So, we hired HydroQual, a company with a core competency of water quality assessment and modeling, to examine the TMDLs. HyrdoQual's assessment is in the attached letter dated February 10, 2009 from Tom Gallagher and addressed to Don Summit. Mr. Gallagher identifies several concerns with the TMDLs and he offer suggestions for improvement. He correctly states that the linkage between dissolved oxygen, chlorophyll-a and phosphorus loading was not demonstrated in the TMDL study. In addition, he states that the BATHTUB model is inappropriate for Cutler Reservoir. The QUAL2K model is more suitable. We are attaching Mr. Gallagher's letter and his comments to this letter and submitting then as detailed evidence that the report is indefensible and should be rejected.	Comment noted. See response to detailed comments below.	Comment noted. See response to detailed comments below.
B	2	6	WQE	Under Section 303(d) of the Clean Water Act (CWA), Cutler Reservoir has been identified as water quality limited due to low dissolved oxygen (DO) and excess phosphorus loadings. Excess phosphorus to reservoirs can cause eutrophic conditions as indicated by high chl 'a' levels and low DO. Based on literature review, Utah DEQ established summer chl 'a' endpoints of 19 and 22 ug/L for Northern Cutler Reservoir and Southern Cutler Reservoir, respectively. Existing DO standards are the endpoints for Cutler Reservoir TMDL, but the linkage between DO, chl 'a' and phosphorus loading has not been demonstrated in this TMDL.	See response to Comment B-1-4, B-1-5c, and B-1-35.	See response to Comment B-1-4, B-1-5c, and B-1-35. Chlorophyll a endpoints were removed from the Final TMDL.
B	2	7	DAAN	Utah DEQ has determined that the corresponding total phosphorus (TP) levels that will achieve these chl 'a' targets are 70 and 90 ug/L for the Northern and Southern Reservoirs, respectively. However, as stated in the TMDL Report, an evaluation of the proposed phosphorus TMDL to meet existing DO criteria in Cutler Reservoir was not performed because "a quantitative linkage between dissolved oxygen and total phosphorus could not be derived for the Cutler Reservoir TMDL due to the unique morphometry of the reservoir, the uncertainty associated with turbidity water quality data, and interference from non-algal turbidity associated with natural (i.e., wind) and internal (i.e., carp) factors."	See response to Comment B-1-4 and B-1-35.	See response to Comment B-1-4 and B-1-35.
B	2	8	WQE	Chl 'a' measurements are not corrected for pheophytin and, therefore, do not represent chl 'a' of viable algal cells. Experience from previous studies indicates that the pheophytin corrected chl 'a' can be 25% less than the uncorrected chl 'a' measurement. Therefore, it is possible that the uncorrected summer average chl 'a' levels of 23 and 24 ug/L in the Northern and Southern Reservoir may actually be meeting the corrected chl 'a' targets of 19 and 22 ug/L for the Northern and Southern Reservoirs, respectively.	See response to B-1-5d.	See response to B-1-5d.

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B	2	9	BATH/WQE	There are no dissolved orthophosphate (PO4) measurements in the Reservoir or tributaries. In waterbodies with short residence times (4.5 days for Cutler Reservoir during summer) dissolved PO4 is the principal form of phosphorus available for algal growth. Therefore, any quantitative linkage between reservoir algal levels and phosphorus must consider dissolved PO4 concentrations rather than total phosphorus or dissolved phosphorus.	Orthophosphate data are available (see response to Comment B-1-11)	Orthophosphate data are summarized in the Final TMDL. A paired comparison between orthophosphate and dissolved phosphorus is also included in the Final TMDL. The BATHTUB model in the Final TMDL will only estimate total phosphorus. Chlorophyll a will not be predicted using BATHTUB in the Final TMDL. Linkages between total phosphorus and algal growth will remain qualitative and will be used as one line of evidence for selected total phosphorus endpoints (see response to Comment B-1-35.
B	2	10	WQE	There are no measurements of sediment oxygen demand (SOD) or sediment nutrient fluxes in Cutler Reservoir. The DO and chl 'a' levels in Cutler Reservoir may be significantly affected by SOD and nutrient fluxes from organically enriched sediments, which are present in the reservoir. In particular, modest SOD and nutrient fluxes can produce significant changes in water column DO and phosphorus levels because of the shallow water conditions present in the reservoir.	Comment noted. Organic matter will also respond over the long-term to nutrient reductions to the reservoir. This process may require additional study that is appropriate for a phased TMDL. DWQ recognizes that SOD is influencing the entire DO curve by depressing oxygen during both day and nighttime periods. An SOD endpoint may be appropriate in a future phase of the TMDL. This may be attained through nutrient reductions (resulting in less internal generation of organic matter), reduced BOD/organic matter loading from the reservoir and/or dredging. This would be part of subsequent phases of the TMDL if the nutrient reductions identified in this TMDL fail to attain water quality endpoints.	As part of the monitoring plan associated with the Final TMDL, milestones and monitoring goals will be established that are designed to support a quantitative linkage between nutrients-chl a and DO in the future. Likewise, the monitoring plan will include SOD, periphyton, and macrophyte data collection with the intent to draw a site-specific quantitative linkage between these factors and DO in the future.
B	2	11	WQE	There are no measures of other algal biomass that can affect water column DO and phosphorus levels. In addition to phytoplankton, as characterized by chl 'a', there are no measurements of algal biomass associated with macrophytes, epiphytes, or periphyton. The large diurnal DO ranges of 5-14mg/L reported for Cutler Reservoir can not be produced by phytoplankton alone as represented by chl 'a' levels of 20 to 30 ug/L. Therefore, it is highly likely that there is significant primary productivity associated with macrophytes, epiphytes, or periphyton. An understanding of the link between phosphorus inputs, speciation, reservoir chl 'a' and DO levels must consider these other forms of primary productivity.	Comment noted. DWQ recognizes that there are no measurements of periphyton associated with macrophytes. However, the diurnal dissolved oxygen patterns are primarily located in the open water portions of the reservoir where suspended algae are the primary autotroph. DWQ appreciates that the large diurnal dissolved oxygen fluctuation observed in the reservoir may indicate higher chlorophyll a values than have currently been recorded. Because diurnal DO data were collected at different times than the chlorophyll a data, this question would need to be addressed in subsequent monitoring. Macrophyte respiration may contribute to some of the odd DO curves observed in littoral zones.	See response to Comment B-2-10
B	2	12	BATH	The Bathtub Model used in this TMDL is inappropriate for the Cutler Reservoir. Bathtub is an empirical model that relates nutrient concentration to chl 'a' levels in reservoirs. Its empirical relationships between nutrients and chl 'a' were developed primarily from data on reservoirs with much deeper depths (3 to 25 m) and much longer resident times (weeks to years) than Cutler Reservoir. For example, the residence time in the Bathtub model segments representing Cutler Reservoir range from 5 hours (segment 5) to 3 days (segment 4) with the other three segments' residence times equal to or less than 12 hours each. The Cutler Reservoir segment depths range from 0.33m to 1.96m.	See response to Comment B-1-23.	See response to Comment B-1-23.
B	2	13	BATH	The Bathtub Model can not compute DO levels in the Cutler Reservoir and, therefore, it can not address whether the proposed phosphorus TMDL will meet the Utah DO criteria. Although it is recognized that the DO balance in Cutler Reservoir may be affected by factors that are difficult to quantify, it is still not acceptable to use a model framework that does not address DO impairment and the defined TMDL DO endpoint in Cutler Reservoir.	The model was never intended to be used to calculate dissolved oxygen. Nowhere in the TMDL is it suggested that the model is used for this purpose. The linkage to dissolved oxygen in the phased TMDL and establishment of total phosphorus endpoints is through a weight of evidence approach. See response to Comment B-1-35.	See response to Comment B-1-35.
B	2	14	WQE	The available uncorrected chl 'a' data is not sufficient to characterize Cutler Reservoir as eutrophic. Future measurements of corrected chl 'a' measurements may show that Cutler Reservoir is in compliance with chl 'a' targets established by Utah DEQ.	See response to comment B-1-5c, B-1-5d, and B-1-35.	See response to B-1-35.
B	2	15	SOID	The available water quality and sediment data in Cutler Reservoir is inadequate to support the proposed phosphorus TMDL. A scientifically established link between point and nonpoint source phosphorus loads and Cutler Reservoir water quality (chl 'a', TP, and DO) cannot be developed with the available data.	See response to comments B-1-10, B-1-11, B-1-12, and B-1-35.	See response to comments B-1-10, B-1-11, B-1-12, and B-1-35.
B	2	16	BATH	The Bathtub Model used in the TMDL analysis is not suitable for Cutler Reservoir. The water depth and residence time in Cutler Reservoir are much smaller than the reservoirs from which the empirical relationships contained in the Bathtub Model were developed.	See response to B-1-23.	See response to B-1-23.

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B	2	17	WQE	There is no linkage between phosphorus loads and Cutler Reservoir DO levels. If future corrected chl 'a' measurements in Cutler Reservoir show compliance with the established targets, there is no quantitative modeling analysis to justify reducing phosphorus loads for the purpose of meeting existing DO criteria in Cutler Reservoir.	See response to Comment B-1-4 and B-1-35.	See response to Comment B-1-4 and B-1-35.
B	2	18	DAAN	Measure summer pheophytin correct chl 'a' levels in Cutler Reservoir to determine established chl 'a' targets are currently being attained.	See response to Comment B-1-5d and B-1-35.	See response to Comment B-1-5d and B-1-35.
B	2	19	DAAN	Conduct two to four intensive sampling programs designed to understand the factors affected DO levels in Cutler Reservoir. Generally, this would include measurements of chl 'a', nutrients, light extinction (or Secchi depth), TSS, BOD, particulate organic carbon (POC), temperature, pH, and DO. Sampling should include 7 to 10 stations in Cutler Reservoir and all major tributaries.	Recommendation noted.	The recommendations will be considered when developing the monitoring plan that will accompany the Final TMDL.
B	2	20	DAAN	In addition to the intensive surveys of Cutler Reservoir, perform special studies to further understand the linkage between phosphorus, chl 'a', and DO. 1) Measure all SOD and sediment nutrient fluxes in Cutler Reservoir. 2) Measure periphyton, macrophyte, and epiphyte biomass in Cutler Reservoir. 3) Concurrent with the intensive surveys, install instruments to continuously record DO temperature, and pH at a few stations in Cutler Reservoir.	Recommendation noted.	The recommendations will be considered when developing the monitoring plan that will accompany the Final TMDL.
B	2	21	SOID	To gain immediate insight into linkage between phosphorus, chl 'a', and Cutler Reservoir DO levels, use data to perform preliminary modeling analyses with the QUAL2K model. The QUAL2K model includes the linkages between phosphorus inputs, primary productivity (phytoplankton chl 'a' and periphyton), and DO levels in a quantitative framework. This modeling analysis could be quite helpful in determining the most important factors affecting Cutler Reservoir chl 'a' and DO levels and thereby lead to a more focused monitoring program. This preliminary modeling analysis may also provide guidance in establishing interim point and nonpoint source phosphorus loads.	QUAL2K is an excellent model for systems with uniform flow (i.e. streams). Conditions at Cutler are far from uniform. In addition, QUAL2K also would not account for respiration associated with macrophytes or periphyton using data available for the Cutler system. Further, to define boundary conditions for Cutler would require an immense dataset and development of numerous small linked segments. Daily data sets (measured, interpolated, or watershed model) would be required for each tributary input to drive the model. Increasing model complexity without the data to drive and calibrate the model dramatically increases the uncertainty associated with the output.	See response to Comment B-1-35 regarding weight of evidence approach and application of BATHTUB for TP prediction only in the Final TMDL.
B	5	1	Process	PacifiCorp has participated in the Bear River and Cutler Reservoir Total Maximum Daily Load (TMDL) process and related Water Quality Study since its inception in 2004. The purpose of the study, which was originally intended to be completed in early 2006, was to identify the causes and sources of beneficial use impairment and set appropriate goals for restoring water quality. Since the initial meeting, PacifiCorp and other stakeholders on the Cutler Reservoir Technical Advisory committee (CRTAC) met monthly to discuss how to determine if water quality in Cutler Reservoir is impaired, whether the data collected in the resultant studies show that it is impaired, what the causes of any detected impairment are, and what can be done about detected impairments. The recent culmination of this process includes the development of a Draft Bear River and Cutler Reservoir TMDL, including most importantly, the phosphorus load limits that will be necessary to correct the impairments detected throughout the TMDL process. Because water quality in Cutler is almost completely dependent on the inputs to the reservoir, the proposed TMDL and associated load limits should be implemented to protect and improve the beneficial uses of this water.	Comment noted.	No change.
B	5	2	Process	PacifiCorp's interest as a stakeholder in this process is derived from its ownership and operating responsibilities of the Cutelr Hydroelectric Project, licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act, which creates Cutler Reservoir and marsh. As a result, PacifiCorp is the largest landowner in the TMDL project area (owning essentially the entire shoreline of the reservoir, and thousands of acres of adjacent wetlands and uplands). Further, the inputs to Cutler (via the Bear River, Logan River, Little Bear and Spring Creek drainages, and particularly those direct inputs to the reservoir itself) impact the lands and waters the company manages for recreation resources, wildlife habitat (both aquatic and terrestrial), and traditional agricultural opportunities. The Cutler project license contains five broad objectives which stipulate that PacifiCorp improve recreation resources, wildlife habitat, scenic resources, water quality, and maintain traditional agricultural uses. Pursuant to its FERC license, PacifiCorp developed a resource management plan to carry out these objectives. The plan, in part, implemented measures within PacifiCorp's control, to improve water quality within Cutler Reservoir. PacifiCorp appreciates the state's commitment to developing the TMDL, and its willingness to accommodate the interests of the CRTAC by funding several additional studies beyond those initially envisioned. PacifiCorp has also conducted numerous water quality studies in the Cutler project area since before 1995, similarly showing water quality impairments, and will continue to conduct such studies at intervals throughout the remainder of the current license period. We believe the State of Utah	Comment noted.	No change.

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				has accurately determined and documented both the existence and magnitude of the water quality impairments in the identified reach of the Bear River and Cutler Reservoir.		
B	5	3	Process	Given all this information, it was somewhat disturbing to hear, at the two January 2009 public meetings for the Draft TMDL, that some stakeholders still question whether there is a problem with water quality in Cutler Reservoir. Despite the overwhelming evidence collected during this TMDL process, as well as PacifiCorp's water quality studies conducted for over 15 years, there are a few CRTAC participants that still question the most basic premise of the TMDL process: that water quality in the Bear River in Cache Valley and Cutler Reservoir is impaired. These questions persist despite the CRTACs agreement with earlier study results, modeling methodologies, and data analysis conducted during the multi-year process that led up to the completion of the Draft TMDL.	Comment noted.	No change.
B	5	4	WQE	PacifiCorp believes that the current Draft TMDL correctly identifies system impairments, nutrient sources, and nutrient limits. The company believes the proposed phosphorus limits should be incorporated into existing and new point source permits and implemented as expediently as possible.	Comment noted.	No change.
B	5	5	WQE/ Process	More work can be done to further refine the 'unknown/internal' phosphorus load to the reservoir, which may present additional opportunities to identify and decrease point sources, as well as to identify those non-point sources that may be appropriate for additional nutrient load reductions. However, given that questions still persist for some regarding the existence and magnitude of water quality impairments, the company does not believe it would be prudent to authorize a phased implementation as currently proposed by the document. Phased implementation is not prudent because it does not establish definite timelines for meeting water quality criteria. Implementation should be completed on a defined schedule, as it seems clear that a phased implementation would only allow additional time to elapse before necessary corrections to water quality impairments are made, allowing the system to further degrade. A defined schedule, with specific deadlines and target reductions, would ensure water quality improvements are realized in a timely manner.	The selection of a Phased TMDL approach is based on three uncertainties: attainment of other TMDLs in the watershed, the qualitative linkage analysis, and the unique nature of Cutler Reservoir. The selection of a Phased TMDL is different from phased implementation. The endpoints identified in this TMDL, even though it is 'phased', require immediate actions to move towards attainment. Following completion of the TMDL, the state will move forward with nonpoint source implementation planning and will reopen point source permits in the watershed to ensure that they are consistent with endpoints and load allocations identified in the TMDL. During the permitting process, a compliance schedule for point source reductions will be negotiated. A 10-year time frame has been identified for the first phase of the TMDL. If water quality endpoints have not been attained by 2019, the TMDL will be reopened and additional measures taken to further reduce pollutant sources in the watershed.	Section 7.1 has been made more explicit to explain the nature of the Phased TMDL. New section (7.6) added to provide reasonable assurance of TMDL attainment.
B	5	6	IMP	PacifiCorp is concerned that further water quality degradation in the system could negatively impact public recreation use as well as wildlife and fisheries habitat that the company has worked diligently to improve through the multi-million dollar implementation of FERC license requirements and associated management plans and permits. For example, an increase of toxic blue-green algae in that system, a possibility discussed in several CRTAC meetings, could impact not only those resources, but also could degrade Bear River and Cutler Reservoir water for livestock and other beneficial agricultural uses. Cutler Reservoir provides a wide variety of benefits to the communities of Cache Valley. Further degradation of this valuable resource will impact the ability of Cache Valley to provide for the needs of the agricultural, tourism, recreation (including hunting, university and scientific communities, as well as the various rural and suburban cities and towns that depend on these resources.	Comment noted.	No change.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	5	7	IMP/ WQE	PacifiCorp supports the overall findings of the TMDL, and appreciates the opportunity to be involved in this very important multi-year process. The company urges the State of Utah to implement the proposed phosphorus load limits as expediently as possible. Again, PacifiCorp is concerned that the proposed phased implementation will not work at this time for the reasons stated above. A defined implementation schedule appears to be the only way to assure the necessary improvements to water quality. Therefore, PacifiCorp urges the state to no longer consider phased implementation, and instead to simply create a schedule that will afford all affected parties the certainty they need to move forward with implementing the new phosphorus load limits in a timely manner.	Comment noted.	No change.
B	12	1	EDIT	I would like to comment on page 121, section 4.1.1.2.2 Logan Regional Wastewater Treatment Plant (WWTP). In the second paragraph of this section it states that the City of Logan has a contract with the Logan Cow Pasture Water Company Corporation to deliver 19 cfs of water to irrigation ditches west of the Logan Regional WWTP. It should be known that this contract or obligation is due to water rights filed through the State of Utah that the Logan Cow Pasture Water Company acquired many years ago. Also in this contract is the requirement to keep the irrigation water on the land with no overflow. If there is a significant return flow it is due to poor management by the Logan Cow Pasture Water Company and not the City of Logan. This discharge water from the Lagoons is mixed with other irrigation water as it is used for irrigation water on the fields in the Logan Cow Pasture Water Company. Also the valley view highway canal can be filled with discharge water or water from the Logan River. Return flow from fields irrigated with this water can be misleading depending on the source of the water. I feel that the word significant and directly used in this paragraph should be removed, so that the sentence reads A portion of the water returns to irrigation ditches via irrigation return flow and eventually drains into Cutler Reservoir.	Comment noted. The estimate in the current TMDL does not include assumptions of other irrigation water sources. When other sources of water are used, a larger percentage of return flow would have to be assumed given the assumption that 19cfs is constantly delivered to irrigation canals from the Logan WWTP. DWQ is open to the commenter proposing an alternative method to estimate the load associated with this return flow using existing data and information.	Additional information regarding the irrigation canals and land that is partially irrigated with Logan WWTP discharge was not available for incorporation into the Final TMDL.
B	12	2	LOAL	In addition to these comments, the statement "In addition, during periods of harvest irrigators do not use the water released from the canal and it flows directly from the WWTP canal to Cutler Reservoir via irrigation ditches." is incorrect. During the periods of harvest the irrigators turn the water back into the canal and it flows to the large screw pump station and is delivered to the constructed wetlands. This water is used to keep the wetland plants alive during the irrigation season.	Documentation regarding discharge to and retrieval from the irrigation canal was requested from the City of Logan but was not provided to this TMDL process.	If additional information and/or documentation can be provided, the estimates associated with irrigation return flow can be refined. No information was provided.
I	3	1	DAAV	I attended the public hearing today and it occurred to me that more phosphate should precipitate out of the reservoir, given the high pH and high Ca. If these ions are allowed to interact and are not disturbed they should form CaHPO4 and then slowly crystallize to apatite, a very insoluble mineral. Possibly the large number of carp are keeping these reactions from happening when they disturb the sediment. If research into the kinetics and equilibria of these reactions in Cutler water has already been done, please tell me where I can find it. If not, I think it would be well worth our while to understand the chemistry involved.	The physical and chemical dynamics described by the commenter have not been researched for Cutler Reservoir.	The recommendations of the commenter will be considered when developing the monitoring plan for the Final TMDL.
I	8	1	DAAN	The fact that the advisory committee appointed to study the phosphorous in Cutler Dam cannot agree on the findings of the study is an indication to me that the TMDL study is faulty. I understand that the readings were taken at low water times, that part of the report comes from assessing the points of view of those who live along the Bear River (not very scientific), that there are no bench marks from which to make judgement, no assurance that the change in water management will result in less "pollution." I know that Utah State studies indicate that the fish population is abundant and diverse and that there is no proof whatsoever that a change would result in change in the number or quality of fish. Mike Allread, as quoted by the Herald Journal on January 23, 2009, said he "hoped (HOPED) it would be a preventive measure to help the fish before they were seriously impaired." No proof that the fish are impaired or that the measures suggested by the state would be helpful in that regard. It appears to me that the study is a sham and a shame.	See response to Comment B-1-8 regarding drought conditions. See response to Comment B-1-3 regarding the fishery study and impairment determinations.	See response to comments B-1-3 and B-1-8.
I	9	1	DAAN	Professor Phaedra Budy, project manager of USU's fisheries studies has spoken out in disagreement with the proposed results of the study. She asked at the meeting held in Logan in January 20 what would happen if all regulations were met and no impact was made to the fish population. There has been no proof that any good will come from different water management of the water coming from the sewer lagoon treatment. Mike Allred of the Utah Division of Water Quality said he hoped more stringent regulations would be a preventive measure to help the fish. There are no previous studies done on the TMDL (Total Maximum Daily Loading) with which to have a bench mark. Please know that I stand with Professor Budy on this issue.	No comments from Dr. Budy have been received by UDWQ. The Clean Water Act requires TMDLs to bring water bodies into attainment of state water quality standards. For Cutler Reservoir, the standards relate to dissolved oxygen and are protective of fish, other aquatic life, and their associated food chains including benthic macroinvertebrates.	No change.

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
I	10	1	LOAL	I am writing to you about the Cutler Dam TDML study. I believe this whole process was designed mainly to point a finger at someone for a cleanup effort. That someone seems to be Logan City and maybe the Swift meat company. Instead of concentrating on just these two points I believe it would be far better to form a joint effort between Utah, Idaho, and possibly Wyoming and spend 100 million to reduce the total nutrients upstream from Cutler Dam. The presenters of this study act like making Logan City pay for the whole thing would solve the problem for the whole system, which is crazy. I believe this whole study as it is currently being presented is a government scam and should be cancelled.	Comment noted. Load allocations were divided equally among all sources in the watershed, point and nonpoint sources. Load reductions for Logan City are no higher than the reductions required from all other sources in the Southern portion of the watershed. No load reductions, beyond those already identified in the Spring Creek TMDL, have been identified for JBS Swift and Co. See also response to Comment B-1-34.	No change.
I	14	1	RATE	In a time such as now with all the economic hardships facing families, now is NOT the time to be placing such a tremendous economic burden on people for this reason. Besides, don't several Idaho principalities dump their water from their sewer ponds into the Bear River as well. If this is the case, it certainly is not the responsibility of a few Cache Valley towns to pay the price for this.	Economic costs and funding mechanisms for attaining the targets identified in the TMDL will be considered during implementation planning. Decisions on how to comply with TMDL requirements are not dictated by DWQ and will be made by the City of Logan. DWQ is confident that the TMDL can be implemented without economic hardship on residents in Cache Valley.	No change.
I	15	1	RATE	Estimates for effective treatment of Logan's point source phosphorus input range from $12M to $250M. As we understand current mechanisms, ratepayers will have to bear this cost regardless of whether the rest of the source is ever addressed by the non point contributors that supply the bulk of the loading. This ineffective response would represent a waste of resources by the ratepayers and failure of stewardship by the DEQ as it diverts resources from programs with more significant impacts on environmental quality in Cache Valley and the watershed.	See response to Comment I-14-1.	No change.
I	15	2	SOID	The study does not appear to establish that there is a causative relationship between reservoir water quality and phosphorus loading. If that link is established, or if the study is published as written without establishing causation, it must also be recognized in the regulatory phase to follow that per the study conclusions, even if point sources fully address their portion of the loading reduction, the reservoir will still not come close to meeting the arbitrary phosphorus loading goal without significant participation from non point sources. Point sources should not be held responsible for their reductions until a mechanism is in place to implement the balance of the reduction plan.	See response to Comment B-1-4 regarding the linkage analysis. See response to Comment B-1-34 regarding load allocation. See response to Comment B-1-35 regarding endpoint selection.	See response to Comments B-1-4, B-1-34, and B-1-35.
I	15	3	DAAN	Summary: 1) The study does not establish a link between the TMDL for phosphorus and reservoir function 2) This failure will detract from our ability to effectively address more pressing environmental problems in the valley, namely non point source nutrient reduction and air quality.	Nonpoint source nutrient reduction is explicitly identified in the TMDL as a major source that requires reduction for TMDL attainment. Additional resources to address nonpoint sources in the watershed will become available with the completion of the TMDL as the watershed will be able to compete for more 319 funds. See also response to comments B-1-4, B-1-34, and B-1-35.	See also response to comments B-1-4, B-1-34, and B-1-35.
I	16	1	DAAN	First, the Study relies on the supposition that Phosphorus is the limiting nutrient in the Cutler Reservoir systems. Trophic State Indices like the Carlson model used in the Study are useful indicators (see also Vollenweider, Larsen Mercier TSI models), but their predictions are based on statistical groupings of parameters common to "average" conditions. Models give an indication of the health of a system, but do not conclusively define it. Model results must be viewed in light of functional behavior and weighted accordingly. The TSI model predictions in the study appear to be in conflict with the other parameters examined, and the reliance on the TSI points to a solution that requires a significant reduction in phosphorus input into the Reservoir.	The TMDL recognizes that the reservoir is co-limited by phosphorus and nitrogen. However, the TMDL explicitly aims to push the system to a phosphorus limited system such that total algae can be controlled and the likelihood of blue-green algal blooms can also be reduced. TSI values were not used to establish water quality endpoints associated with TP due to the complexity of the system. See response to comment B-1-35 regarding the Weight of Evidence approach used to support the selected water quality endpoints.	See response to Comment B-1-35.
I	16	2	RATE	The data seems to suggest that the reservoir is functioning, so why go to the expense and pull our focus away from areas where the money and human capital could be better spent?	Comment noted.	No change
I	16	3	DAAN	Before the TMDL recommendations are accepted, there should be a clear causative relationship established between the actions recommended and the desired outcomes. On the one hand, the reservoir productivity appears to be acceptable. On the other hand it doesn't fit the norms of an arbitrary model. We should find out why before spending resources to attempt to resolve an issue that may be more perceived than real so that the money and time invested in Cache Valley have the most impact for the most people.	See response to Comment B-1-4 regarding linkage. See response to Comment B-1-23 and B-1-24 regarding model. See response to Comment B-1-35 regarding endpoints.	No change.
I	17	1	RATE	I think that a increase like you are talking about in Logan is crazy, there must be another way to solve this problem! There is many people that it would really hurt the way things are now. Please think through this and find a different way. I just can't afford a increase of this size.	See response to Comment I-14-1.	No change.
I	18	1	DAAN	In general, I think the BR/CR TMDL and the process that created it have been exhaustive. There's never as much data as we'd like, but there is clearly enough data to show that there is a substantial impairment in dissolved oxygen (DO) in Cutler Reservoir, and the science is compelling that the cause is excessively high concentrations and loading of total phosphorous (TP) that have led to eutrophication. The BR/CR TMDL includes numerous examples of data (direct and indirect, e.g., by correlations with Chlorophyll a concentrations) indicating both low DO and excessively high TP.	Comment noted.	No change.

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
I	18	2	EDIT	The state's role in resolving the water quality problem is critical. Local municipalities and agricultural operations will very simply not value the designated beneficial uses (DBUs) nor address their pollution until forced to do so by a higher level of government. Logan City, in particular, has put forth a very disappointing performance, especially considering their proactive efforts at environmental stewardship on other fronts in the past (e.g., recycling).	Comment noted.	No change.
I	18	3	DAAN	There is virtually no direct data on the health of the Class 3D beneficial use, "protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain." The state has performed no avian surveys, especially during migration and nesting. The only macroinvertebrate data is a small sampling collected by USU students under the direction of Dr. Wayne Wurtsbaugh. It is essential that we initiate some studies to determine what is – and what should be – there. It would be instructive to compare bird population densities at Cutler Reservoir to those at the Bear River Migratory Bird Refuge nearby.	DWQ recognizes that the 3D use has not been well studies at cutler reservoir.	The recommendations of the commenter will be considered when developing the monitoring plan for the Final TMDL.
I	18	4	DAAN	I agree with Logan City that more monitoring is needed. Unlike the city, however, I believe the problems are much more serious than DWQ has realized. The data on DO at Benson Marina, the place in the entire reservoir with probably the fastest flow, is alarming enough. I can't imagine what it must be like in many of the shallows around the edge of the reservoir. The habitat available for anything but very low DO-tolerant fish species must be concentrated, indeed.	DWQ agrees that additional data collected in the littoral areas of the reservoir may support more extensive water quality impairments. See also response to Comment B-1-5c regarding recorded algal blooms in littoral areas of the reservoir.	The recommendations of the commenter will be considered when developing the monitoring plan for the Final TMDL.
I	18	5	IMP	We must not let Logan City delay implementation. I am sympathetic to the need to acquire and be responsive to additional data, particularly on sediment oxygen demand and its associated processes. I believe adaptive management could help keep costs as low as possible. However, costs are not the only consideration. If we, as citizens, allow them, Logan City will claim economic hardship – deserved or not – forever and they will never act to clean up their waste. We need to remind them that they took clean water from mountain streams and wells. The least they can do is to clean up their sewage waste to meet reasonable pollution levels before discharging into a public waterway. It's long past time we – and I include myself as a Logan City resident – stopped using Cutler Reservoir as a sewage treatment facility.	DWQ agrees that the TMDL needs to move to completion. The implementation plan is the next step in the process. The schedule for implementation of both point and nonpoint sources will be identified in this phase.	No change.
I	18	6	WQE	We need additional compliance points, such as at the Valley View Marina on Highway 30 to ensure upstream TMDLs are performing. It's a long way in shallow water from the Mendon Road to Benson Marina.	DWQ agrees that future monitoring in the main body of the Southern reservoir would be helpful in future analyses.	The recommendations of the commenter will be considered when developing the monitoring plan for the Final TMDL.
I	18	7	TAC	The TAC has been a valuable resource, but we need to restructure it to replace those participants, such as the J.B. Swift representative, who have overly narrow and simplistic attitudes as represented by his statement that, "my personal opinion is that if 12-14 species of fish and 72 species of birds have been found in the reservoir, then there must not be a problem." This shows gross ignorance of the ecology and importance of such resources, and an unwillingness to understand reality.	Comment noted.	No change.
I	18	8	LOAN	Perhaps instead of thinking about not degrading Cutler Reservoir any more by setting a standard of 0.09 mg/L of Total P, we should investigate what the reservoir could be with a Total P of 0.025. Perhaps we could show what incredible potential it really has and that would convince the naysayers at Logan City.	See response to Comment B-1-35 regarding establishment of water quality endpoints.	No change
I	18	9	SOID	3.2.3.1 Note that station #4905040 Logan River at Mendon Road is over 10.5 miles upstream of Cutler reservoir. There are numerous stretches downstream of this point through pastures and along steep eroded banks that will be picking up sediments.	DWQ recognizes that the monitoring site for Logan River underpredicts the load associated with that drainage.	The drainage boundary was redrawn for the Logan River to separate the portion above and below the monitoring point (same for Little Bear and Spring Creek). Load for the lower portions of these drainages was estimated using the same load coefficients applied to the direct drainage areas of the watershed. This reduced the uncertainty associated with the 'unknown' load in the Southern Reservoir.
I	18	10	EDIT	Page 71 Figure 3.4: Example of diurnal data from trolls. Why would DO saturation follow temperature? DO saturation concentrations should be highest when temperature is lowest.	Potential dissolved oxygen saturation is a function of both temperature and pressure. As temperature goes down, more dissolved oxygen is required to reach 100% of potential saturation. DO saturation is really following DO patterns. Temperature and oxygen patterns follow a similar diurnal pattern because sunlight raises water temperatures during the day and also feeds photosynthesis which results in oxygen production by algae.	No change.
I	18	11	IMP	Given the data on pages 81-85 shouldn't Cutler be listed for temperature, too?	DWQ will evaluate the temperature data and potential impairment during the next 303(d) listing cycle.	No change.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
I	18	12	EDIT	Page 86: "Concentrations of TP observed in both the reservoir datasets and the inflow dataset contain numerous concentrations in excess of the threshold values. All of the current data available for Cutler Reservoir demonstrate greater than the 0.025 mg/L threshold value, with maximum values greater than 1.0 mg/L observed in-reservoir (Table 3.27 and Table 3.28). Over half of the data available for the Middle Bear River exceed the 0.05 mg/L threshold value, and most of the data available for other Cutler Reservoir tributaries exceed the threshold with maximum values over 1.5 mg/L in the Little Bear River, Spring Creek, and Clay Slough (Table 3.28)." Wow!	Comment noted.	No change.
I	18	13	IMP	I would be honored to continue serving on the Technical Advisory Committee as we enter the next phase of the process to achieve "fishable-swimmable" surface water.	Comment noted.	No change.
O	6	1	WQE	Great Salt Lakekeeper supports the recommended targets and endpoints for reducing excess phosphorus and improving dissolved oxygen levels.	Comment noted.	No change.
O	6	2	LOAL	Great Salt Lakekeeper also supports the recommendations for reducing phosphorus loads and improving dissolved oxygen levels by focusing on reductions of loads from AFOs and CAFOs and municipal wastewater treatment plants in the region. Great Salt Lakekeeper supports the recommended phased approach to reduce loads and improve water quality.	Comment noted.	No change.
O	6	3	IMP	Great Salt Lakekeeper objects to the lack of support and protection for recreational swimming (beneficial use 2A) in the TMDL plan, and recommends that the DWQ and TMDL Committee do more to ensure that the Middle Bear River and Cutler Reservoir be swimmable. Great Salt Lakekeeper recommends that further steps be adopted to control and prevent the growth of algae in the waterways so that the public will be more motivated to swim. As the Cache Valley grows into the future, Great Salt Lakekeeper believes that Cutler Reservoir will experience increased pressure and demand for recreational swimming, and expect the TMDL to provide more protections for this future use.	The recreation use was considered in identifying nuisance algal thresholds for the algae in the reservoir. The State of Utah has designated the beneficial uses of Cutler Reservoir and the Middle Bear River to be secondary contact recreation. Swimming is considered primary contact recreation and therefore is not a beneficial use designated to Cutler Reservoir and the Middle Bear River	No change.
O	6	4	WQE	We hope the Division of Water Quality will not allow local pressure to influence raising phosphorus and dissolved oxygen targets and endpoints higher than the recommended levels in the TMDL plan.	See response to Comment B-1-35 regarding water quality endpoint selection.	No change.
G	19	1	EDIT	Page 4 last paragraph reads; Pollutants of concern listed for Cutler Reservoir were low DO and total phosphorus. I wouldn't consider DO a pollutant but a result of pollution.	This is standard language consistent with the executive summary and Section 303(d) lists and other water quality documents.	Revised to read: "Pollutants of concern listed for Cutler Reservoir were total phosphorus with associated low DO as a consequence of nutrient loading." Executive summary was not revised.
G	19	2	EDIT	Page 13 second Paragraph and Page 18 last paragraph it reads; "During the winter season water from the Bear River is diverted into Bear Lake." Water is diverted beginning mid October through winter and spring to early summer. Most water enters Bear Lake during high runoff flows from mid April to early June depending on how the snow melt comes off.	Will revise accordingly.	Added content to p.13 and p.18: "Water is diverted beginning mid-October through winter and spring into early summer. Most water enters Bear Lake during high runoff flows from mid-April to early June." No previously existing content was revised.
G	19	3	EDIT	Table 2.9 There have been no bluehead sucker or Grizzly bear in the drainage for some time however they have been present in the past.	Will revise accordingly.	Added footnote for the 2 species: "* Historic distribution in Cache County."
G	19	4	EDIT	Table 3.27 There should be some indication that the secchi depths are measured in meters.	Will revise accordingly.	Table title revised to read: "Table 3.27. Summer Season (May–October) Summary Statistics for Secchi Depth (meters) during the Current Period of Record (1995–2006)"
G	19	5	EDIT	Figure 3.9-3.11: Fish will spawn when the temperatures are right not by the calendar I don't believe these figures hold your argument in my mind.	Dates in the graph are actual water quality sampling dates. Clarification will be made in the figure captions.	Revised accordingly.
G	19	6	EDIT	Page 105 3.3.4.2 It reads Carp made up less than 70% of the total fish biomass. It could have just easily said and been just as accurate that Carp made up less than 100% of the total fish biomass. It should have read something like; Carp made up just less than 70% of the total fish biomass. Or Carp made up slightly less than 70% of the total fish biomass.	Will revise accordingly.	Revised to read: "Carp made up just less than 70% of the total fish biomass."
G	19	7	EDIT	Page 106 second paragraph. Questions and comments to this office indicate that black crappie are highly sought after at Cutler.	Will revise accordingly.	Revised to read: "Primary sport fish targets appear to be channel catfish, black bullhead, and carp (Budy et al. 2007), as well as black crappie."
G	19	8	MONP	Appendix H. Cutler Reservoir Monitoring Plan. In all sections of the management plan there are specifics (timing and methods) to monitoring except for Fisheries studies. There is no monitoring plan for fish.	Comment noted. DEQ will consider in future monitoring planning.	No change.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
G	19	9	LOAL	Chapter 7. On the load allocation given to Fisheries Experiment Station it doesn't appear that the Division of Wildlife has been given any credit for the cuts that have been already made at the facility to reduce phosphorous outputs. These cuts were made using best science and about the only other way to reduce outputs will be to raise 40-60% less fish if that is the case it will probably shut this production facility down.	Load allocations have been changed to give credit for recent wastewater upgrade.	Load allocations match current load of the facility in the final TMDL.
I	20	1	EDIT	Section 3.3.5 We very much appreciate the attempt to analyze the health of avian species and their food chain, however, the data from Bridgerland Audubon Society doesn't really represent the typical habitat in the reservoir (emergent and shallow water marsh). Until we have data on breeding and non-breeding use of the reservoir itself, the state's assessment as "supporting" for this beneficial use needs should be changed to "unknown." The limited data showing less-than-ideal macroinvertebrate populations would certainly support this change, which is where WQ impacts are greatest.	Comment noted. DWQ will consider when revising DBU status in for the next 305(b) assessment report.	Caveats added to Section 3.3.5: "These data may not be representative of typical habitat conditions in the reservoir, and additional data are needed to fully assess breeding and non-breeding bird use of reservoir habitats."
I	20	2	LOAN	Section 7.1 Is ten years really enough time to allow sediment P to be flushed if point source reductions do not occur immediately?	We still believe that 10 years is an appropriate time frame for revisiting the TMDL. At that point internal load can be reassessed and adjustments made as necessary.	Text changed to read: " Ten years is a sufficient period of time for the reservoir to begin flushing excess phosphorus residing in bottom sediment and/or for sediments that are less phosphorus rich to cover the top of the existing sediment.
I	20	3	EDIT	Appendix G. Still very limited fishery data; and only at places of abnormally high (w/ re: to rest of reservoir) flow, and probably higher DO. Conclusions about the reservoir need to be tentative until sampling is completed in the littoral zones.	Comment noted. Uncertainties associated with the fishery and its linkage to DO are incorporated into the decision to use a Phased TMDL and in the explicit Margin of Safety for this TMDL.	No change.
I	20	4	MONP	Appendix H. Cutler Reservoir Monitoring Plan: Good to include monitoring points in littoral zones. The Logan River should be monitored below Mendon Road – too much happens between there and Cutler Reservoir.	Comment noted. DEQ will consider in future monitoring planning.	No change.
I	20	5	IMPP	Appendix I. I am very concerned about the timeline in the Adaptive Management Plan. It is much too long and there is too much emphasis on studying the problem and the limits of "affordability" with no commitment to real improvement for over a decade. Given the City's reticence and lack of integrity in working with the rest of the TAC vis-à-vis its denial of impairments, allowing the City control over data and implementation is like asking the fox to guard the henhouse. The City promises to "support and consider" phosphorous reductions, but no targets for budgets or personnel are made. Given the public statements of the Director of the Environment Department, these are hollow promises. There's no reason, for example, why the line item to "Construct Wastewater Treatment Improvements" can't begin in year 3 or 4. Given their eagerness to address the problem to date, by the time the City gets to year 7, they will probably be pushing any construction to year 15.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
I	20	6	SOID	The City should not be the sole repository of WQ data; they should be required to provide all data to DEQ for independent analysis.	The City reports data to DWQ through the DMR process. All datasets were used in the analysis.	No change.
I	20	7	IMPP	The language in the proposed Adaptive Management Plan is all about delay. The City is obviously not actively seeking to remedy the phosphorous problem as quickly as possible. Urban users have been dumping waste into Cutler Reservoir for many years. True, it will take many years for it to return to a healthy state, but the City needs to approach this with a sense of urgency, not lassitude.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	LOAL	Since the 1997 Middle Bear River Phosphorus target of 0.05 has not yet been attained, we are very concerned that the implementation schedule proposed by Logan City will result in non-attainment of the new Cutler TMDL limits for decades yet to come. Logan City, as well as all other contributors and stakeholders, need to take aggressive action now to reduce phosphorus loads in Cutler and the Bear River to avoid further impairments; PacifiCorp urges the State of Utah to consider the long timelines required for the beneficial effects to be measured post-implementation and require more aggressive timelines for implementation than that proposed by Logan City. We would like to see all implementation completed by the end of 2014 at the latest (see additional specific comments on Appendix I of the TMDL), rather than current proposed schedule which suggests implementation would still be being undertaken in 2019.	Comment noted. See Appendix I cover sheet. Implementation schedule will be negotiated during the permitting process.	No change.
B	21	B	MONP	We believe that the current lack of littoral site monitoring that was undertaken for the development of this TMDL has likely under-represented the extent of impairments in Cutler Reservoir, by minimizing sampling in locations likely to show the greatest impairments to water quality, specifically in measurements of dissolved oxygen, but also across other water quality criteria. Therefore, we believe that additional monitoring sites need to be implemented as part of the proposed future monitoring in the backwater and other large littoral zones that exist at Cutler.	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	EDIT	On page 42 of the document, a reference was made to "Utah Power and Light"; please do a global search of the document and replace with 'PacifiCorp" where appropriate.	Will revise accordingly.	Document revised.
B	21	B	EDIT	In at least three locations (pp. 4, 13, and 189), the term "partially supported" is used. Have the new 2008 regs been approved eliminating this term? If so, please add a footnote (global search for other instances as well) indicating that "partially supported" is a term that is no longer in use; per the current regs, the referenced DBUs are ***not*** supported.	Yes the new 2008 regs have been approved. The term is only used to reference old assessment reports (e.g. 2004) that used the term 'partially supported.'	None. All references to partial support, partially supporting or partially supported are in reference to 2004 or 2006 documents.

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Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	21	B	EDIT	On page 13 of the document, "The 6,900-acre Cutler Reservoir watershed, including the Middle Bear River…" This seems rather small - even for just the direct watershed area. Especially if it includes the Middle Bear River as it states. Later in the document (pg 16) it says 6,900 square miles, which seems more correct. Please check this fact.	Will revise accordingly.	Changed to 6,900 square miles on pages 13 and 208.
B	21	B	EDIT	On page 19, "The dam was constructed in 1927 by Telluride Power and is currently operated by PacifiCorp Energy" Actually, it was Utah Power and Light at the time. The company is now known as PacifiCorp. Suggested modification: "The dam was constructed in 1927 by Utah Power and Light, now known as PacifiCorp".	Will revise accordingly.	Revised to read: "The dam was constructed in 1927 by Utah Power and Light, now know as PacifiCorp. The dam is currently operated by PacifiCorp Energy to provide water for agricultural use and power generation."
B	21	B	MONP	Introduction 2nd line – Valley, Utah. Irrigation ~~W~~water delivery… 4th line – aquatic and wetland habitat and recreation. PacifiCorp owns and operates the reservoir under a license from the Federal Energy Regulatory Commission (FERC). The reservoir….	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	Existing Water Sampling Locations Comment: consider adding a map for locations of sampling sites (will also show the lack of littoral sites).	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	Additional monitoring sites for Southern Reservoir, including the littoral areas: Comment: note potential effect (impacts under- represented) of all sampling at relatively fast moving water sites. Third paragraph, 2nd sentence …. areas of the reservoir during a subsequent phase… Comment: please add more specifics as to when we will establish additional monitoring sites.	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	Hydrologic and water quality monitoring for the irrigation canals and pipes discharging directly to the reservoir 2nd paragraph – Water quality data will be collected from irrigation canals on a periodic basis…. Comment: specify how often. This is a critical point to understand what water is reaching Cutler Reservoir from overflow and return flow on a daily basis during the irrigation season.	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	3D Beneficial Use (birds and their food chains such as benthic macroninvertebrates) 12th line ….are being incorporated into the Integrated Report… Comment: What is this?	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	Implementation Monitoring and Reporting to a Centralized Project Database	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	MONP	Qualitative (examples) Development and distribution of Information and Education materials ??? Record changes in sediment volume in collection …… ??? Compile and publish ski resort and golf course Watershed Restoration… ??? Track enforcement and violation of Construction ……..??? Comment: Why? How will these help? It is unclear to us how these items will address qualitative water quality monitoring issues at Cutler Reservoir. Please add more on how ski resort and golf course watershed restoration measures (for example) will address the issues at Cutler.	Comment noted. DEQ will consider in future monitoring planning.	No change.
B	21	B	IMPP	Similarly, specific comments on Appendix I Adaptive Management Implementation Plan include: Page 1, 5th line: …the goals of the City of Logan are to develop a phased wastewater program that is affordable…….. The TMDL adaptive management plan is designed to relect the City of Logan's planned implementation activities based on…….program needs. Comment: The focus in the Introduction should not be how implementation meets the goals of the City of Logan in being affordable; the focus should be on implementation of effective, efficient, and timely measures to address the clear problems of impaired water quality in Cutler Reservoir and the Bear River. The needs are to improve water quality of the reservoir, per the TMDL.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	9th line – Implementation of the required phosphorus reductions to Cutler Reservoir is necessary to improve water quality of the reservoir. Comment: this phrase is immaterial to the overall implementation plan; again the focus should be on improving water quality per the TMDL. 13th and 14th line: …and further assess and understand water quality ~~and fishery~~ conditions… Comment: Delete 'and fishery'.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 2 – 2nd bullet – Comment: ten years is too long. We suggest five as an achievable alternative. 3rd bullet – …to develop TMDL. Comment: Delete noted words. If this TMDL is not attainable and maintainable, then further actions will be required to meet CWA standards. 4th bullet- Comment: The City of Logan should not be the entity that determines whether data is valid, and then interprets said data. This should be a State of Utah function. Please address in the Implementation Plan.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 5 – Table 4 Last 3 Proposed Mechanisms to Address/Accommodate Gap …….. lack of comprehensive fisheries data, lack of information on perceived support status……. lack of information on wetland functional status - Comment: What gaps are perceived here? I thought that these gaps were addressed during the development of this TMDL. Please explain/address.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	21	B	IMPP	Page 6 – 4th line – …Operational changes to reduce phosphorus loadings, such as modified wastewater effluent management… Comment: What does this mean? Please explain specified operational changes. 2nd bullet – … Incoming phosphorus ……	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 8 – WWT-5, WWT-6, WWT-7, WWT-8, WWT-9 – Comment: Why are we waiting so long to start design and implementing actual operational changes? This timeline is unacceptable and will lead to more many-years-post-TMDL without attaining load limits (similar to the 1997 Bear TMDL).	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 9 – 3.1 – 3rd line – …are tangible TMDL support activities… 3.1.1. – 5th line – ….001B… Comment: This is not noted on Figure, please add	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 10 – 3rd line – ….that is rarely used…. (Outfall 001B). Comment: 1/4 of time is not rarely; please specify when it is used.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 11 – Figure 4 – Comment: Add 001b load.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 12 – 4th line –... the loads diverted to land application and the reservoir and estimating….. 2nd paragraph – Comment: Return flows need to be addressed—there is substantial load to the reservoir from overland, over-irrigation, and return irrigation flows 4th paragraph – 3rd line – …agricultural recycling and then to Cutler via return/overflows. The remainder…	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 13 – Activity: Flow measurement of effluent flows to agricultural land Cost Estimate - $5000-10,000 Comment: Flows off agricultural land also need measured.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 14 – 6th line – …The City of Logan's Environmental Dept. will maintain the data…Comment: This proposal is not appropriate. Only the State of Utah should be maintaining data, establishing sampling locations, frequencies, and recording the results. 11th line- Activity: Identify locations for water quality monitoring and establish sampling locations, determine sampling frequency, perform sampling and track record results Comment: See previous comment. This is not appropriate; the State should be the lead agency for this activity.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 15 – 3.1.4 – 2nd paragraph, 2nd line – …other more powerful water quality models is an option… Comment: like what? 3.1.5 – 5th line – …eliminate water quality exceedances. Developing a framework with a viable schedule… Comment: delete text above; specify viable schedule. Page 16 – 3rd paragraph – ….unforeseen event affects the landscape, the timelines to meet the load allocations in the TMDL may need modification. Comment: We presume this means shortened TMDL timelines, correct? 5th paragraph – ….the report will provide something like a scorecard or report card to monitor the adaptive management plan. Comment: If adopted this proposal should be reviewed by the state and the TAC for accuracy.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 17 – 3.1.7 – Cost Estimate $50000 to 100,000 – Comment: Cost seems high just for a plan.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 18 – 3.2.1 Comment: Will this be difficult given recent news coverage from the city claiming no impairment exists? 3rd bullet – appropriate management of pet waste (i.e., "scoop the poop:) Comment: Seems somewhat immaterial to the overall water quality issues at Cutler.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 20 – 3.2.3.2. – While the city of Logan has little control due to water rights issues, land application of wastewater is needs…. Comment: Confusing sentence; also, since Logan City signed agreement with Cow Pasture Canal Co, it does not seem entirely accurate. Last sentence of 3.2.3.2. – ….totals more than crop needs or if water flows are excessive.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 21 – Last paragraph – Comment: Fertigation does not seem an option to explore further as we already have significant overflow problems with irrigation.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 24 – 3.2.4.1. – Comment: Why is this education/outreach program not listed as part of previous of other education efforts? 2nd sentence from the bottom –…Develop and implement a technical assistance program.. Comment: What is this specifically? Why not just enforce existing regulations and requirements and use the dollars indicated to take proactive measures to protect and improve water quality in the reservoir.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 25 – 3.2.4.3. – Comment: Won't this be required as part of meeting existing stormwater regulations? If so, it should not be additionally counted here.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 27 - Comment: But note that septic systems are still preferential to direct discharge, common in the Benson area and surrounding sloughs.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.

Table J-3. Public Comments and UDEQ Responses

Commenter Type	Letter Number	Comment Number	Comment Resource Code	Comment	Response to Comment	Resultant Change to Document/Analysis
B	21	B	IMPP	Page 28 – 3.2.6 -- Comment: Shouldn't this cost be borne by the various industries for pretreatment, especially if this is the source of up to 50 percent of the phosphorus load? If not, Logan City should not be counting it in their total costs, as it seems their choice to assess their customers for this cost.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 30 – 3.3 – last line – …round of actions to enhance the effectiveness of the program. ~~with time~~ Comment: Delete as specified.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 31 – first line – ….for voluntary actions to be implemented while ordinance changes are adopted on an appropriate schedule. Comment: Please specify what this means. Which voluntary actions are being considered?	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 41 - 3.3.2.3. – Last 2 lines: The potential development or restoration of other wetlands in the watershed for phosphorus reduction will be led by PacifiCorp and Bridgerland Audubon Society. Comment: Please edit as noted. Please also specify what roles are envisioned for PacifiCorp and BAS here.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 42 – 5th line – Comment: Change Rocky Mountin Power to PacifiCorp.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	3.3.3. – 3rd line – Reduced tailwater runoff (return flows)… Comment: How will this be accomplished? We currently have both return flows and overland seepage that gets to water from existing land application sites. 3.3.3 – 2nd paragraph, 2nd line – Farmers near the wastewater lagoons ~~to~~ divert …. Comment: Delete 'to' or clarify sentence. 4th line – …an additional 3 mgd of the City of Logan effluent is used for wetland and wildlife habitat… Comment: Where and how does this occur?	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 44 – Comment: Figure 12 map is inaccurate. Please correct boundaries shown—PacifiCorp can provide information to correct if necessary.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 45 – Lead agencies – Comment: add PacifiCorp	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 47 – 5.2 – second line – …Performance measures do not measure… Comment: If helpful: when we are tracking performance measures, we refer to 'Compliance tracking' to simply measure whether or not some action has been completed (i.e., did we do what we said we would); 'Performance tracking' tells us whether our proposed actions are actually being successful in changing to the desired outcome.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 48 – 3rd line – …as used here, may be how many acres of wetlands enhancement were accomplished (Comment: example of compliance tracking, see above), not the change in the effluent stream concentrations (Comment: example of performance tracking, see above). 6th paragraph – Examples of some compliance Comment: delete and add as indicated.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 49 – 6 Adaptive Management – second paragraph, 5th sentence –effective and efficient decisions…. Comment: delete and add as indicated. Last sentence – change the scheduled activities in later phases based on the data collected in this early phase. Comment: What does this mean? Please specify. Statement is too loose as written.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.
B	21	B	IMPP	Page 50 – 4th line – …dissolved oxygen….under current water quality standards… Comment: What does this mean? Please clarify or delete 6th line – Comment: change 'reduced' to reduce. Bullet list: Comment: How do these provide assurance? Are these future desired condition statements or does this indicate the current status of these activities? The rationale needs clarified and supported if these are currently true (i.e., current outreach programs? Recently the claim was made that no impairment exists). Last bullet needs to be substantively altered to: "The City of Logan is committed to a phased adaptive management approach that is protective of water and that will lead to the long term water quality improvement of Cutler Reservoir". The bullet list lacks any mention of real changes that will be necessary to meet water quality standards and improve the impairments currently found in the reservoir, let alone those that may be expected through current growth patterns (80 percent growth in Cache Valley in the next two decades will substantially further strain water quality in Cutler and the Bear with additional effluent alone, let alone other growth-related impacts). Last line: …DEQ is authorized to impose strict requirements or issue enforcement actions to achieve compliance with state water quality standards. However, it is the goal of all participants in the TMDL process to achieve clean water through cooperation and implementation of this adaptive management plan. Comment: What is the purpose of this statement? Please clarify.	Comment noted. Adaptive management plan proposed by Logan City will be finalized during permitting process.	No change.