

Exhibit 1-38

South Platte River Basin

Rationales for Segments and Parameters Proposed
for Inclusion in
Regulation No. 93

Water-Quality-Limited Segments Requiring
Total Maximum Daily Loads
(303(d) List)

October 4, 2011

Aquatic Life Use Attainment Assessment Summary

Segment WBID: COSPBE01a

Segment Description: Mainstem of Bear Creek from the boundary of the Mt. Evans Wilderness area to the inlet of Evergreen Lake.

Designation: Reviewable

Use Classifications: Aquatic Life Cold 1, Recreation E, Water Supply, Agriculture

Assessed Portion: Bear Creek

WBID/HUC Code: COSPBE01a

Collection Date of Sampling Event: 20-Sep-10

Organization: WQCD

Waterbody Class: Class 1

Biotype: Biotype 1

Date	Location	Multimetric Index Score (MMI)	Hilsenhoff Biotic Index (HBI)	Shannon Diversity Index
20-Sep-10	Bear Creek at Key of the Green GC	36.75	3.5432526	1.233836653

Existing Water Quality Data:

Water Quality data for this segment currently exists, however all parameters have been evaluated and the segment is meeting the assigned standards. The WQCD anticipates collecting additional water quality and biological data for this segment in the next few years to continue the investigation into potential sources.

Attainment Conclusions:

Multimetric Index (MMI) scores were calculated for the 2012 listing cycle, utilizing the Water Quality Control Commission's (WQCC) Policy 10-1, Aquatic Life Use Attainment. In accordance with Section 303(d) Listing Methodology for the 2012 Listing Cycle, approved by the Water Quality Control Commission in March 2011, this segment will be provisionally listed as impaired for Aquatic Life Use.

Comparison with Aquatic Life Thresholds: Thresholds are established based on analysis of the biological condition at reference sites in each of three biotypes.

Table 1. Aquatic Life Use Thresholds			
Biotype		Attainment Threshold	Impairment Threshold
1	Transition	52	42
2	Mountains	50	42
3	Plains & Xeric	37	22

- Class 2 water bodies: When the MMI score falls within the gray zone (between the attainment and impairment thresholds discussed above) and the site is from a Class 2 stream, the stream is considered to be in support of the use.
- Class 1 water bodies: An MMI score in the gray zone for site on a Class 1 water requires examination of additional information – see Subsection 4 below.

Recognition of Class 1 / Class 2 Distinction: The Hilsenhoff Biotic Index and the Shannon Diversity Index are used as auxiliary metrics that supplement the MMI for Class 1 waters with MMI scores between the attainment and impairment thresholds. If a Class 1 site fails to meet the criteria shown in Table 2 for either auxiliary metric, the site will be considered impaired. For Class 2 waters, the premise that these “waters are not capable of sustaining a wide variety of cold or warm biota, including sensitive species” mitigates the need to further confirm attainment or impairment through use of auxiliary metrics. Accordingly, for Class 2 waters, a single threshold provides the basic determinant between attainment and impairment (see Table 1). Auxiliary metrics are not applicable to Class 2 waters.

Table 2. Auxiliary Metric Thresholds For Class 1 Waters with MMI Scores Between the Attainment and Impairment Thresholds			
Biotype		Hilsenhoff Biotic Index	Shannon Diversity Index
1	Transition	<5.4	>2.4
2	Mountains	<5.1	>3.0
3	Plains & Xeric	<7.7	>2.5

Standards Attainment Assessment Summary

Segment WBID: COSPBE01c

Segment Number & Description: 1c. Bear Creek Reservoir and Soda Lakes

Designation: Reviewable

Use Classifications: Aquatic Life Cold 1
Recreation E
Water Supply
Agriculture

Assessed Portion: Bear Creek Reservoir **Surface Area:** 110 Acres
HUC Code: 1019000202

Control Regulation:

Mean chlorophyll = 10 µg/l and mean total phosphorus = 32 µg/l measured through collection of samples that are representative of the mixed layer during summer months (July, August, September) and with an exceedance frequency of once in five year.

Water Quality Information: A total of 74 profiles were collected from Bear Creek Reservoir by the Bear Creek Watershed Association between 1/14/2003 and 12/3/2007. Water quality samples were also collected on these dates by the Watershed Association.

Table 1. Physical Standards Applicable to Lake Profiles – Bear Creek Reservoir			Number of Profiles Not In Attainment	
Applicable Standard DO (mg/l)	Applicable Standard Temp. (°C)	Total # of Profiles	Temperature*	DO** – Epilimnion
6.0+	23.3	74	0	0
<p>*Lakes are not listed for temperature if an adequate refuge exists in lower layers of the lake. Adequate refuge requires attainment of both DO and temperature standards. If an adequate refuge does not exist because of low DO in the lower layers, the lakes is listed for DO, not temperature.</p> <p>**Attainment of DO standard in lakes is assessed in the upper layer (0.5-2m), unless temperature is not attained in this layer, and then lower layers are assessed for the presence of an adequate refuge with respect to the temperature standard.</p>				

Below is a table summarizing the site-specific standards for Bear Creek Reservoir.

Table 2. Summary of Site Specific Standards and Ambient Data for Bear Creek Reservoir									
Constituent	Averaging Period	Standard, µg/l	Exceedance Frequency	2004	2005	2006	2007	2008	Comment
Total Phosphorus	July - September	32	Once in 5 yrs	35.6	48.4	33.1	31.8	70.2	4 exceedances in 5 yrs
Chlorophyll	July - September	10	Once in 5 yrs	10.2	25.8	16.1	8.0	25.8	4 exceedances in 5 yrs

Biological Information: No assessment of biological information was performed.

Other Information: No assessment of other attainment information was performed.

Attainment Conclusions:

Bear Creek Reservoir was originally placed on the Monitoring and Evaluation List (M&E) in 2010 because dissolved oxygen (DO) was below the standard in the metalimnion (middle layer) on several dates the reservoir was sampled. However, in 2012, the DO standard was revised in the Regulation 31, and now the dissolved oxygen standard only applies to the top 0.5-2 meters of the water column, unless assessing for refuge with regards to the temperature standard. When assessing against the revised standard, Bear Creek Reservoir is now attaining the dissolved oxygen standard, as DO readings are above 6 mg/L in the top 2 meters of the water column on all dates, with only one exception. On 7/27/2005, DO readings in the epilimnion were marginally below the standard (6mg/l) from the top to the bottom of the reservoir; however, the integrity of the data on this date is questionable. Profiles from two weeks before and after this date show DO concentrations well above 7 mg/l. Due to the physical properties of water and the time/energy required to change concentrations of DO in large volumes of water, it seems highly unlikely that the DO in Bear Creek Reservoir could decrease by 2 mg/l in just two weeks time. For this reason, the data from 7/27/2005 will not be considered in this assessment. Because Bear Creek Reservoir is attaining the DO standard in the upper layer, the Division is proposing to remove Bear Creek Reservoir from the M&E List for DO.

Bear Creek Reservoir has site specific standards for total phosphorus (TP) and chlorophyll *a*(chl). Data for TP and chl was averaged from July through September for each constituent. Both total phosphorus and chlorophyll exceeded standards 4 of the 5 years examined. For this reason, the Division is recommending that Bear Creek Reservoir remain on the 303d list for TP and chlorophyll. No new data water quality data was available for assessment in 2012.

Use	Assessed		Attainment		IR Category	Causes	Sources
	Yes	No	Yes	No			
				303d			
Water Supply	X		X				
Recreation	X		X				
Aquatic Life	X			X	5	TP, Chl <i>a</i>	Unknown
Agriculture	X		X				

Additional Information Regarding Pollutant Source (if known): unknown

Aquatic Life Use Attainment Assessment Summary

Segment WBID: COSPBE01e

Segment Description: Mainstem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch.

Designation: Reviewable

Use Classifications: Aquatic Life Cold 1, Recreation E, Water Supply, Agriculture

Assessed Portion: Bear Creek

WBID/HUC Code: COSPBE01e

Collection Date of Sampling Event: 20-Sep-10

Organization: WQCD

Waterbody Class: Class 1

Biotype: Biotype 1

Date	Location	Multimetric Index Score (MMI)	Hilsenhoff Biotic Index (HBI)	Shannon Diversity Index
20-Sep-10	Bear Creek below Evergreen	39.1	3.76190476	3.208339786

Existing Water Quality Data:

Water Quality data for this segment currently exists, however all parameters have been evaluated and the segment is meeting the assigned standards. The WQCD anticipates collecting additional water quality and biological data for this segment in the next few years to continue the investigation into potential sources.

Attainment Conclusions:

Multimetric Index (MMI) scores were calculated for the 2012 listing cycle, utilizing the Water Quality Control Commission's (WQCC) Policy 10-1, Aquatic Life Use Attainment. In accordance with Section 303(d) Listing Methodology for the 2012 Listing Cycle, approved by the Water Quality Control Commission in March 2011, this segment will be listed as impaired for Aquatic Life Use.

Comparison with Aquatic Life Thresholds: Thresholds are established based on analysis of the biological condition at reference sites in each of three biotypes.

Table 1. Aquatic Life Use Thresholds			
Biotype		Attainment Threshold	Impairment Threshold
1	Transition	52	42
2	Mountains	50	42
3	Plains & Xeric	37	22

- Class 2 water bodies: When the MMI score falls within the gray zone (between the attainment and impairment thresholds discussed above) and the site is from a Class 2 stream, the stream is considered to be in support of the use.
- Class 1 water bodies: An MMI score in the gray zone for site on a Class 1 water requires examination of additional information – see Subsection 4 below.

Recognition of Class 1 / Class 2 Distinction: The Hilsenhoff Biotic Index and the Shannon Diversity Index are used as auxiliary metrics that supplement the MMI for Class 1 waters with MMI scores between the attainment and impairment thresholds. If a Class 1 site fails to meet the criteria shown in Table 2 for either auxiliary metric, the site will be considered impaired. For Class 2 waters, the premise that these “waters are not capable of sustaining a wide variety of cold or warm biota, including sensitive species” mitigates the need to further confirm attainment or impairment through use of auxiliary metrics. Accordingly, for Class 2 waters, a single threshold provides the basic determinant between attainment and impairment (see Table 1). Auxiliary metrics are not applicable to Class 2 waters.

Table 2. Auxiliary Metric Thresholds For Class 1 Waters with MMI Scores Between the Attainment and Impairment Thresholds			
Biotype		Hilsenhoff Biotic Index	Shannon Diversity Index
1	Transition	<5.4	>2.4
2	Mountains	<5.1	>3.0
3	Plains & Xeric	<7.7	>2.5

Standards Attainment Assessment Summary

Segment WBID: COSPBE01e

HUC Code: 10190003

Segment Number & Description: 1e. Mainstem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch.

Designation: Reviewable

Use Classifications: Aquatic Life Cold 1
Recreation E
Water Supply
Agriculture

Table 1. Assessed Portion of Segment

Assessed portion:	Listed portion:
All	All

Table 2. Water Quality Information

Site ID	Site Description	Org	Latitude	Longitude	Datum	POR
UBC1	Above Dedisse Park, above Evergreen Lake	TU	39.63409	-105.34239	UNK	6/10-8/10
BCC1	Bear Creek Cabins below Evergreen Lake, above Kittredge	TU	39.64343	-105.30758	UNK	6/10-8/10

Site	MWAT	DM
BCC1	2(7/10); 1(8/10)	1(6/10)
UBC1	2(7/10)	1(6/10); 1(7/10)

Attainment Conclusions: The mainstem of Bear Creek Segment 1e has a Cold Stream Tier 2 temperature standard. This means that from April through October the maximum Weekly Average Temperature (MWAT) standard is 18.2 and the Daily Maximum (DM) standard is 23.8 degrees Celsius. The exceedances in July of 2010 all happened within the same timeframe, so by utilizing our bias removal procedures, only two MWAT exceedances were counted for the month of July 2010. For this period of record, there are 3 MWAT exceedances and 3 DM exceedances on this segment. Therefore, the Division is proposing to include COSPBE01e on the 303(d) List for non-attainment of its Aquatic Life Use-based temperature standard.

Table 8. Integrated Reporting (IR) Information							
Use Classification	Assessed		Attainment of Standards			IR Category*	Causes
	Yes	No	Yes	No			
				303d	M&E		
Water Supply	X		X			1	
Recreation	X		X			1	
Aquatic Life	X			X		5	Temp. AQ Life
Agriculture	X		X			1	
*IR Category	Description						
1	All designated uses are supported						
3	There is insufficient available data and/or information to make a designated use support determination						
4a	A TMDL is established						
5	Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed						

Aquatic Life Use Attainment Assessment Summary

Segment WBID: COSPBE02

Segment Description: Mainstem of Bear Creek from the outlet of Bear Creek Reservoir to the confluence with the South Platte River.

Designation: Reviewable

Use Classifications: Aquatic Life Warm 1, Recreation E, Water Supply, Agriculture

Assessed Portion: Bear Creek

WBID/HUC Code: COSPBE02

Collection Date of Sampling Event: 8-Jan-09, 25-May-06

Organization: WQCD, Riverwatch

Waterbody Class: Class 1

Biotype: Biotype 1

Date	Location	Multimetric Index Score (MMI)	Hilsenhoff Biotic Index (HBI)	Shannon Diversity Index
8-Jan-09	Bear Cr Pierce St, RW	45	6.21686747	3.447175449
25-May-06	Bear Creek at mouth, WQCD	31.4901426	6.15625	2.711222645

Existing Water Quality Data:

Water Quality data for this segment exists with the following exceedances: *E.coli*

Attainment Conclusions:

Multimetric Index (MMI) scores were calculated for the 2012 listing cycle, utilizing the Water Quality Control Commission's (WQCC) Policy 10-1, Aquatic Life Use Attainment. In accordance with Section 303(d) Listing Methodology for the 2012 Listing Cycle, approved by the Water Quality Control Commission in March 2011, this segment will be provisionally listed as impaired for Aquatic Life Use.

Comparison with Aquatic Life Thresholds: Thresholds are established based on analysis of the biological condition at reference sites in each of three biotypes.

Table 1. Aquatic Life Use Thresholds			
Biotype		Attainment Threshold	Impairment Threshold
1	Transition	52	42
2	Mountains	50	42
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- Class 1 water bodies: An MMI score in the gray zone for site on a Class 1 water requires examination of additional information – see Subsection 4 below.

Recognition of Class 1 / Class 2 Distinction: The Hilsenhoff Biotic Index and the Shannon Diversity Index are used as auxiliary metrics that supplement the MMI for Class 1 waters with MMI scores between the attainment and impairment thresholds. If a Class 1 site fails to meet the criteria shown in Table 2 for either auxiliary metric, the site will be considered impaired. For Class 2 waters, the premise that these “waters are not capable of sustaining a wide variety of cold or warm biota, including sensitive species” mitigates the need to further confirm attainment or impairment through use of auxiliary metrics. Accordingly, for Class 2 waters, a single threshold provides the basic determinant between attainment and impairment (see Table 1). Auxiliary metrics are not applicable to Class 2 waters.

Table 2. Auxiliary Metric Thresholds For Class 1 Waters with MMI Scores Between the Attainment and Impairment Thresholds			
Biotype		Hilsenhoff Biotic Index	Shannon Diversity Index
1	Transition	<5.4	>2.4
2	Mountains	<5.1	>3.0
3	Plains & Xeric	<7.7	>2.5

Standards Attainment Assessment Summary

Segment WBID: COSPBE02

Segment Number & Description: 2. Mainstem of Bear Creek from the outlet of Bear Creek Reservoir to the confluence with the South Platte River.

Designation: Reviewable

Use Classifications: Aquatic Life Cold 1
Recreation E
Water Supply
Agriculture

Assessed Portion: All

HUC Code: 10190002

Water Quality Information: Water quality information was collected from the following sites:

Data Collecting Agency & Number	Sampling Site	Period of Record
BCWA	BEAR CREEK RESERVOIR DISCHARGE	10/14/2003 – 12/13/2007
BCWA	LOWER BEAR CREEK AT SHERIDAN	10/14/2003 – 12/1/2004
DEH BC33	BEAR CREEK AT GAGING STATION	8/9/2007 – 4/16/2008
DEH BC33	BEAR CREEK AT KNOX COURT	8/9/2007 – 6/4/2009
DEH BC34	BEAR CREEK AT KNOX COURT	9/21/2006 – 6/25/2008
DEH BC35	BEAR CREEK AT KING STREET	9/21/2006 – 9/27/2006
DEH BC43	BEAR CREEK AT STUART STREET	8/9/2007 – 6/30/2009
DEH BC45	BEAR CREEK AT UTICA STREET	8/9/2007 – 8/9/2007
DEH BC46	BEAR CREEK AT LOWEL BLVD	5/29/2007 – 6/4/2009
DEH BC75	BEAR CREEK AT WADSWORTH BLVD	5/29/2007 – 6/4/2009
DEH BC-SP	BEAR CREEK AT MOUTH	3/9/2004 – 12/11/2008
LEWWTP	BEAR CREEK (GAGING STATION)	10/1/2003 – 12/5/2007
RW 288	BEAR CREEK AT KIPLING PARKWAY	10/9/2005 – 1/13/2008
RW 766	BEAR CREEK AT PIERCE STREET	11/25/2003 - 11/28/2007
USGS 393948105053501	BEAR CREEK BLW ESTES RD LAKEWOOD	7/18/2007
WQCD 5751	BEAR CREEK AT MOUTH	9/11/2007 – 2/18/2008

Biological Information: No assessment of biological information was performed.

Other Information: No assessment of other attainment information was performed.

Exceedances: The data indicated one exceedance of the acute selenium standard. Per the Listing Methodology a single acute exceedance is allowed once in three years. The segment does exceed the *E. coli* stream standard on a seasonal basis.

Parameter	n	Aquatic Life (dis)	Water Supply	Agriculture	# of Exceedances
Ammonia (mg/L as N)	186	TVS			0
Nitrate (mg/L)			10	100	0
Cadmium (ug/L)	123	4.59	5		0
Copper (ug/L)	123	23.51			0
Lead (ug/L)	123	4.77	50		0
Manganese (ug/L)	123	3638.21			0
Selenium (ug/L)	123	18.40			1
Zinc (ug/L)	123	237.76			0

Parameter	n	Aquatic Life (dis)	Water Supply	Recreation	Agriculture	Ambient*	Exc?
pH s.u.	274	6.5-9.0	5.0-9.0	6.5-9.0		7.7 - 8.4	
D.O. mg/l**	276	5	3	3	3	7.91	no
Hardness	132					181.02	NA
<i>E. coli</i> *** (seasonal)	211			126		150.94	yes
Cadmium (ug/L)	123	0.66			10	0.00	no
Copper (ug/L)	123	14.87	1000		200	1.47	no
Iron Trec (ug/L)	88	1000				248.50	no
Iron dis (ug/L)	123		300 (WS)			292.80	no
Lead (ug/L)	123	4.77			100	0.00	no
Manganese (ug/L)	123	2010	50 (WS)			62.56	no
Selenium (ug/L)	123	4.6	50		20	4.25	no
Zinc (ug/L)	123	206.15	5000		2000	19.65	no
Ammonia (mg/l as N)	186	TVS	0.5(tot)			0.10	no

* Ambient (statistic) = (e.g., 15th, 50th, 85th percentile or geometric mean); ** D.O. during spawning 7.0 mg/l; *** Measured as #/100 ml

Attainment Conclusions: The segment is not in attainment of the *E. coli* standard on a seasonal basis, May through October. The segment has been previously 303(d) listed for *E. coli* based on all samples. During this call for data, considerably more data was submitted. This data included several additional sampling locations changing the data set. The segment is in attainment of the acute selenium standard since only one exceedance of the acute selenium standard was noted.

Use	Assessed		Attainment			IR Category	Causes	Sources
	Yes	No	Yes	No				
				303d	M&E			
Water Supply	X		X			1		
Recreation	X			X		5	<i>E. coli</i>	140-UNKNOWN
Aquatic Life	X		X			1		
Agriculture	X		X			1		

Additional Information Regarding Pollutant Source (if known): Although causes and sources are not identified in the process of developing the 303(d) and Monitoring and Evaluation Lists they are important pieces of information needed for the Integrated Report and for the Assessment Database. Causes and sources have NOT been identified for this segment.

Aquatic Life Use Attainment Assessment Summary

Assessed Portion: Bear Creek

WBID/HUC Code: COSPBE02

Collection Date of Sampling Event: 8-Jan-09, 25-May-06

Organization: WQCD, Riverwatch

Waterbody Class: Class 1

Biotpe: Biotpe 1

Date	Location	Multimetric Index Score (MMI)	Hilsenhoff Biotic Index (HBI)	Shannon Diversity Index
8-Jan-09	Bear Cr Pierce St, RW	45	6.21686747	3.447175449
25-May-06	Bear Creek at mouth, WQCD	31.4901426	6.15625	2.711222645

Existing Water Quality Data:

Water Quality data for this segment exists with the following exceedances: *E.coli*

Attainment Conclusions:

Multimetric Index (MMI) scores were calculated for the 2012 listing cycle, utilizing the Water Quality Control Commission's (WQCC) Policy 10-1, Aquatic Life Use Attainment. In accordance with Section 303(d) Listing Methodology for the 2012 Listing Cycle, approved by the Water Quality Control Commission in March 2011, this segment will be provisionally listed as impaired for Aquatic Life Use.

Standards Attainment Assessment Summary

Segment WBID: COSPBE05

Segment Number & Description: 5. Swede, Kerr, Sawmill, Troublesome, and Cold Springs Gulches, and mainstem of Cub Creek from the source to the confluence with Bear Creek.

Designation: Reviewable

Use Classifications: Aquatic Life Cold 2
Recreation E
Water Supply
Agriculture

Assessed Portion: All **Assessed Length:** Unknown **HUC Code:** 10190001

Water Quality Information: Water Quality information was collected from the following site:

Data Collecting Agency & Number	Sampling Site	Period of Record
WQCD 5758	SWEDE GULCH @ CONF. WITH BEAR CREEK	10/22/2003 – 5/14/2008

Biological Information: No assessment of biological information was performed.

Other Information: No assessment of other attainment information was performed.

Exceedances: Sweede Gulch exceeds the *E. coli* standard.

Parameter	n	Aquatic Life (dis)	Water Supply	Agriculture	# of Exceedances
Ammonia (mg/L as N)	6	TVS			0
Nitrate (mg/L)			10	100	0
Cadmium (ug/L)	6	2.98	5		0
Copper (ug/L)	6	14.70			0
Lead (ug/L)	6	7.42	50		0
Manganese (ug/L)	6	3081.99			0
Selenium (ug/L)	6	18.40			0
Zinc (ug/L)	6	155.50			0