Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Eastern Region Bend Office
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January 15, 2010

Steve Johnson, Manager
Central Oregon Irrigation District
1055 S.W. Lake Ct.
Redmond, OR 97756

Re: COID's Siphon Power Plant; DEQ Water Quality Determination in Support of LIHI Certification

Dear Mr. Johnson,

On December 18, 2009, the Central Oregon Irrigation District sent a letter to the Oregon Department of Environmental Quality requesting that the department provide a written determination relating to water quality impacts of the district's Siphon Power Project. The letter identifies that irrigation district is pursuing low impact certification for the project from the Low Impact Hydropower Institute for which the department's written determination is needed.

In response to the district's request, the department has conducted an assessment of the project's water quality impacts (see attached memo) relative to Oregon's water quality standards and the state's Clean Water Act Section 303(d) list of impaired waterbodies. Based upon this assessment, the department has determined that the hydroelectric project, as currently operated, neither contributes to current 303(d) water quality impairments of the Deschutes River, nor to violations of current state water quality standards.

The department appreciates this opportunity to provide the requested water quality determination and supports the district's continued efforts to operate the project in a low impact manner such that the project will warrant certification from the Low Impact Hydropower Institute.

Sincerely,

Paul A DeVito
Hydropower 401 Specialist

State of Oregon
Department of Environmental Quality — Memorandum

To: File **Date:** January 15, 2009

From: Paul DeVito, Hydropower Specialist

Section: Eastern Region, Bend Water Quality

Subject: COID application for LIHI certification and request for DEQ water quality assessment for the Siphon Power Project

Steven Johnson, manager of Central Oregon Irrigation District (COID), by letter of December 18, 2009, requested a written water quality assessment determination from DEQ relative to COID's Siphon Power Project (SPP; Project) on the Deschutes River upstream of the Bill Healy Memorial Bridge in Bend, OR. This memorandum documents my assessment which will be attached to a letter to be sent back to COID, providing DEQ's written determination in support of COID's application for Low Impact Hydropower Institute (LIHI) certification.

COID provided copies of the following pertinent information:

- LIHI Frequently Asked Questions and Summary of Goals and Standards
- Page 4 of the SPP LIHI application pertaining to DEQ
- DEQ letter filed September 23, 1982
- The Environmental Assessment section of the Federal Energy Regulatory Commission (FERC) license incorporating the DEQ comments of the 1982 letter

DEQ Assessment:

There are two identified water quality standard criteria for LIHI certification: *"First, a facility must demonstrate that is in compliance with state water quality standards, either through producing a recent (after 1986) Clean Water Act Section 401 certification, or demonstrating compliance with state water quality standards (typically be presenting a letter prepared for the application from the state confirming the facility is meeting water quality standards). Second, a facility must demonstrate that it has not contributed to a state finding that the river has impaired water quality under Clean Water Act Section 303(d) (relating to water quality limited streams)."*

DEQ's September 23, 1982 letter states that the agency had examined a draft Exhibit E Environmental Report (component of FERC license application) for the then-proposed SPP and determined that the Project "should not cause any significant change in existing high quality water." On that basis, DEQ waived the requirement to obtain a Section 401 water quality certification for the SPP. The FERC subsequently issued a license to COID for the SPP, and the Project was constructed and placed into operation in the late 1980s.

The FERC license does not include requirements to monitor water quality in the project vicinity. Additionally, there has been no subsequent 401 water quality certification issued for the Project

that might otherwise require the licensee to monitor water quality in the Project's vicinity. Mr. Johnson indicates that COID has not conducted water quality sampling in the Project vicinity to characterize any potential impact the SPP may have on instream water quality.

Since 1982, when DEQ waived its authority to issue a 401 certification for the SPP, the state's water quality standards were revised and DEQ placed multiple segments of the Deschutes River on the Clean Water Act Section 303(d) list for seasonal noncompliance with current water quality standards. COID diverts water out of the river at approximately River Mile 168.2, both for irrigation and hydropower production, with the portion diverted to the SPP powerhouse being returned back to the river approximately 1.5 miles downstream. Upstream of the Project's stream diversion, but not downstream, the river is currently on DEQ's Clean Water Act 303(d) list of impaired waterbodies for sediment (undefined season), turbidity (spring/summer), and Chlorophyll a (summer). The river is also 303(d)-listed both upstream and downstream for dissolved oxygen (Jun 1- May 15) and temperature (summer). Given the upstream and downstream relationship of listed river segments with respect to the Project's point of diversion and bypass reach, only the temperature and dissolved oxygen listings need to be considered relative to LIHI's water quality listing criteria.

In addition to the material identified above, COID provided DEQ with follow-up information pertaining to COID flow diversion quantity and capacity at the Project as well as archival flow data on a specified date. According to COID, the SPP can divert as much as 800 cfs out of river for purposes of hydropower production and irrigation, limited by state water rights and the maximum capacity of the conveyance pipe located immediately downstream of the diversion. Of the maximum 800 cfs diversion, COID is allowed to divert up to 500 cfs for irrigation and up to 300 cfs for hydropower. A minimum instream flow of 400 cfs is required in the river. During the non-irrigation season (generally about October 15-April 15) minimum flows within the 1.5-mile bypass can drop below 400 cfs, generally in association with irrigation withdrawal for stock runs, and hydropower production is curtailed.

Temperature 303(d) Listing

Hydropower projects that divert water out of a stream channel, returning the flow back to the channel some distance downstream, can alter stream temperature within and downstream of their bypassed reaches. Reduced flows within bypass reaches result in reduced stream velocities and an increased stream surface area-to-volume ratio. In some instances, these changes can cause significantly increased rates of seasonal and diurnal warming and cooling within bypass reaches relative to non-diverted full flow conditions. The extent which a bypass reach may appreciably warm or cool relative to full-flow segments is a function of a many variables, primarily the extent of flow and velocity reductions, streamside and topographic shading, and air temperatures. Relative warming is generally a summertime phenomena, especially during the day, while relative cooling with a bypass reach is more prevalent during the winter and more pronounced during the night. Stream temperatures downstream of bypass reaches may also experience relative warming or cooling compared to without-hydro project conditions depending upon the combined effect of the differential warming or cooling experienced within the bypass reaches together with any difference in warming or cooling experienced by the water diverted out of a stream for hydropower production and subsequently returned back to the streams. Closed

conduit (pipe) diversions, especially if buried or well-shaded, tend to preserve the diverted water's temperature more than would be the case of open channel diversion, especially if not shaded.

Relative to the SPP, the time of greatest concern and capacity for potential Project-related warming and violation of the temperature standard would be expected to occur within the summer, generally in July or August. This corresponds to the season which the river in the vicinity of the Project is 303(d)-listed for temperature.

In order to evaluate this concern for potential Project-related warming of the river (contribution to violation of the temperature standard and 303(d) listing), I examined available DEQ data for a Forward Looking Infrared (FLIR) survey of the river that was performed on July 25, 2001 (attached). This date corresponds to the summer season during which the Project would likely have greatest potential of contributing warming to the river. Review and calculation of Bureau of Reclamation Hydromat archival flow data reveals the following estimated flow values for the day of the FLIR flight: 1419 cfs in the river immediately upstream of the diversion; 800 cfs diverted out of river; 619 cfs retained in the river immediately downstream of the diversion; 493 cfs of the 800 cfs diverted was subsequently split off and routed to irrigation; 307 cfs of the 800 cfs diverted was routed to the SPP powerhouse and discharged back to the river. Thus, on July 25, 2001, the maximum amount of water was being diverted out of the river corresponding to the 800 cfs pipe capacity of which just over 300 cfs was being routed to the powerhouse and back to the river approximately 1.5 miles downstream.

It appears, based upon both examination of the color-coded FLIR temperature photos and the graphic representation of longitudinal temperature change that there is no net temperature increase within or immediately downstream of the Project's bypass reach. Thus, DEQ concludes that the Project is not contributing to the Deschutes River's 303(d) listing for temperature.

Dissolved Oxygen 303(d) Listing

Since it appears that the SPP is not contributing to summertime warming of the river, it is very unlikely that it is contributing to river warming during the spring season for which the river is 303(d)-listed for dissolved oxygen. Warming of water results in reductions in dissolved oxygen. Given that DEQ does not expect that Project would cause warming of the river in the spring, DEQ concludes that the Project is not contributing to the Deschutes River's 303(d) listing for dissolved oxygen.

Water Quality Standards

Aside from the potential concern for temperature and dissolved oxygen impacts, discussed and dismissed above, I would not expect that the Project, as currently operated, would appreciably impact other water quality parameters for which the state has water quality standards. The state's 303(d) list identifies waterbodies within the state that are impaired and not meeting water quality standards. As assessed in this memorandum, the Project does not contribute to the water quality impairments of the waterbodies listed in the vicinity of the Project. Hence, DEQ concludes that the Project does not contribute to violations of state water quality standards.

Conclusion

ODEQ concludes that the COID's Siphon Power Project neither contributes to 303(d) water quality impairment listings of the Deschutes River, nor to violations of current state water quality standards.

CENO - Central Oregon Canal
Latitude = 44°01'49" Longitude = 121°17'41" Elevation = 3770. feet

Select the desired Beginning and Ending Dates for your data retrieval:

Beginning Date: Year: 2001 Month: July Day: 1

Ending Date: Year: 2001 Month: August Day: 31

Data Available for Site CENO - Select one or more data parameters:

Code	Available Records	Parameter Description
☐ QJ	1993-2010	Canal Daily Average Discharge (Cubic Feet per Second)
☐ WI	1998-2005, 2008-2010	Water Temperature, Daily Minimum (Degrees F)
☐ WK	1998-2005, 2008-2010	Water Temperature, Daily Maximum (Degrees F)
☐ WZ	1998-2005, 2008-2010	Water Temperature, Daily Average (Degrees F)

Retrieve Historical Data

Note: The years shown as "Available Records" above are "Water Years", which are from October 1 of the previous calendar year through September 30. For example, the Water Year 2004 starts October 1, 2003 and ends September 30, 2004. Water years are commonly used in hydrology because in many basins they encompases the full runoff cycle from fall and winter rainfall and snow accumulation through the subsequent spring and summer runoff.

Change Site Selection:

Hydromet Historical Data Access - Site Selection

This query returns the USBR Hydromet "ARCHIVES" database period of record for a site.
Select a Hydromet Station
ACAO - Ashland Creek Mouth, near Ashland, OR

Find Available Data

CENO == Central Oregon Canal

Provisional Data - Subject to Change

DATE	QJ	WI	WK	WZ
07/01/2001	471.98	58.93	61.60	60.55
07/02/2001	471.40	58.69	61.99	60.62
07/03/2001	476.43	59.79	62.15	61.27
07/04/2001	487.94	59.79	61.92	61.20
07/05/2001	486.65	60.66	63.25	61.93
07/06/2001	487.69	60.66	62.86	61.94
07/07/2001	497.58	59.79	62.62	61.50
07/08/2001	502.23	60.19	63.02	61.76
07/09/2001	502.86	60.66	63.25	62.15
07/10/2001	503.17	61.13	62.70	62.12
07/11/2001	503.34	60.03	62.15	60.71
07/12/2001	503.33	58.69	61.36	60.13
07/13/2001	497.74	59.40	62.39	61.01
07/14/2001	495.21	60.11	62.86	61.60
07/15/2001	496.47	60.34	62.54	61.63
07/16/2001	494.82	59.87	61.92	60.75
07/17/2001	495.01	58.69	60.97	59.47
07/18/2001	495.82	57.04	59.16	58.06
07/19/2001	496.34	57.20	60.34	58.64
07/20/2001	496.52	57.83	60.11	58.87
07/21/2001	492.42	57.04	60.50	58.85
07/22/2001	488.88	58.38	61.36	60.00
07/23/2001	494.65	59.08	62.23	60.84
07/24/2001	496.78	60.66	63.33	62.01
07/25/2001	493.16	60.66	63.09	61.93
07/26/2001	494.16	60.50	62.94	61.79
07/27/2001	493.66	60.11	62.86	61.61
07/28/2001	493.70	59.79	62.31	61.17
07/29/2001	493.93	58.38	60.89	59.39
07/30/2001	487.49	57.12	58.53	57.70

07/31/2001	473.09	55.86	60.03	57.92
08/01/2001	471.43	58.30	61.52	59.80
08/02/2001	473.40	59.40	62.15	60.77
08/03/2001	473.59	60.50	61.92	61.35
08/04/2001	480.04	59.71	61.68	60.67
08/05/2001	480.18	58.53	61.84	60.31
08/06/2001	479.95	60.11	63.17	61.66
08/07/2001	479.81	61.36	63.96	62.74
08/08/2001	479.82	61.21	63.64	62.57
08/09/2001	480.45	60.74	63.09	62.10
08/10/2001	481.56	60.03	62.15	61.32
08/11/2001	481.67	60.26	62.54	61.63
08/12/2001	490.06	60.19	62.39	61.40
08/13/2001	492.97	59.16	61.52	60.51
08/14/2001	497.76	59.48	62.39	61.15
08/15/2001	502.48	60.26	62.70	61.69
08/16/2001	502.59	60.42	63.41	62.01
08/17/2001	500.53	60.03	62.94	61.75
08/18/2001	496.48	59.40	62.15	61.06
08/19/2001	495.26	58.46	61.21	60.09
08/20/2001	495.81	57.91	61.13	59.73
08/21/2001	495.32	58.06	60.34	59.50
08/22/2001	490.48	58.61	60.26	59.70
08/23/2001	488.26	57.98	59.56	58.85
08/24/2001	488.01	57.12	60.11	58.67
08/25/2001	488.77	57.51	60.89	59.26
08/26/2001	488.94	58.46	61.13	59.95
08/27/2001	484.69	59.32	61.68	60.57
08/28/2001	482.17	59.01	61.44	60.38
08/29/2001	483.12	58.85	61.52	60.30
08/30/2001	481.94	58.93	61.44	60.30
08/31/2001	482.66	58.93	61.13	60.13

ARNO == Arnold Canal

Provisional Data - Subject to Change

DATE	MM	MN	MX	QJ	WI	WK	WZ
07/01/2001	60.66	36.52	81.73	93.40	56.96	60.66	59.25
07/02/2001	66.02	43.05	87.86	95.54	56.65	61.13	59.31
07/03/2001	69.13	46.27	86.29	98.59	57.91	61.36	60.06
07/04/2001	72.90	53.42	93.28	97.58	57.67	61.05	59.77
07/05/2001	66.76	51.54	82.12	99.16	58.85	62.47	60.83
07/06/2001	64.07	47.84	81.10	100.47	58.69	61.68	60.61
07/07/2001	65.74	45.88	86.13	101.82	57.59	61.76	60.06
07/08/2001	69.94	53.50	90.45	102.01	57.98	62.23	60.42
07/09/2001	70.68	51.54	92.11	100.89	58.53	62.31	60.83
07/10/2001	70.38	61.36	85.27	99.57	59.16	61.76	60.71
07/11/2001	62.11	52.56	81.33	100.40	57.83	60.81	58.83
07/12/2001	61.00	47.06	79.21	100.60	56.49	59.95	58.37
07/13/2001	63.64	46.11	82.36	99.23	57.59	61.21	59.60
07/14/2001	62.08	43.60	80.94	98.15	58.30	62.07	60.32
07/15/2001	57.65	46.19	72.29	97.43	58.22	61.52	60.20
07/16/2001	52.80	40.77	65.06	96.99	57.91	60.81	59.23
07/17/2001	50.97	36.60	63.02	96.28	56.18	59.95	57.63
07/18/2001	52.53	38.96	64.20	95.08	55.23	57.67	56.42
07/19/2001	54.28	39.35	74.26	95.68	55.55	58.69	57.16
07/20/2001	53.24	43.75	67.65	97.21	55.94	58.22	57.24
07/21/2001	53.66	37.23	74.02	95.78	55.31	58.85	57.32
07/22/2001	59.80	42.89	78.11	95.42	56.25	60.34	58.58
07/23/2001	63.83	44.38	83.38	96.89	57.20	61.21	59.45
07/24/2001	64.99	48.16	84.32	99.19	58.69	61.84	60.69
07/25/2001	65.28	45.33	84.32	101.35	58.61	61.68	60.57
07/26/2001	64.43	45.96	84.79	102.98	58.46	61.44	60.37
07/27/2001	63.52	45.09	83.38	105.37	58.06	61.29	60.16
07/28/2001	58.87	47.84	70.56	105.51	57.98	61.05	59.64
07/29/2001	52.41	42.18	64.67	104.59	56.73	59.95	57.73
07/30/2001	52.76	43.28	63.88	102.01	55.08	57.04	55.91

07/31/2001	54.83	37.86	74.89	99.79	54.05	58.69	56.34
08/01/2001	60.84	44.30	81.18	98.72	56.49	60.03	58.41
08/02/2001	65.23	45.88	82.20	97.96	57.28	60.81	59.34
08/03/2001	63.87	51.30	76.85	97.76	58.46	60.81	59.98
08/04/2001	60.32	49.26	73.55	99.10	57.83	60.58	59.12
08/05/2001	63.24	44.15	84.79	99.26	56.49	60.42	58.77
08/06/2001	67.52	49.34	88.10	98.47	58.14	62.15	60.36
08/07/2001	69.05	50.83	88.88	100.56	59.48	62.62	61.43
08/08/2001	67.37	47.45	85.58	104.18	59.16	62.47	61.21
08/09/2001	68.97	50.52	89.83	104.20	58.77	61.99	60.60
08/10/2001	69.39	54.37	89.67	102.53	57.98	61.21	59.81
08/11/2001	69.92	52.40	90.85	101.13	58.30	61.36	60.16
08/12/2001	68.30	53.58	91.48	100.97	58.22	61.05	59.92
08/13/2001	69.38	51.30	89.43	100.49	56.96	60.11	58.83
08/14/2001	70.75	51.22	89.98	100.83	57.59	61.36	59.79
08/15/2001	71.92	54.68	88.49	103.41	58.30	61.36	60.21
08/16/2001	70.64	53.90	86.92	104.64	58.61	61.99	60.59
08/17/2001	67.14	51.93	87.31	104.71	58.38	61.52	60.39
08/18/2001	57.30	42.89	72.37	105.20	57.59	61.05	59.60
08/19/2001	55.17	35.73	76.77	104.75	56.57	60.03	58.55
08/20/2001	57.54	41.40	77.17	104.66	56.02	59.71	58.23
08/21/2001	58.77	42.50	76.77	105.05	56.02	59.24	57.95
08/22/2001	58.16	52.24	71.98	104.54	56.88	59.01	58.20
08/23/2001	54.39	43.28	65.30	102.97	56.18	58.22	57.20
08/24/2001	53.76	35.03	74.57	101.41	55.47	58.38	57.10
08/25/2001	59.12	37.54	81.88	99.47	55.63	59.56	57.82
08/26/2001	63.70	42.50	83.38	98.40	56.57	59.87	58.51
08/27/2001	64.90	49.57	82.91	99.33	57.28	60.26	59.16
08/28/2001	62.21	46.03	81.96	101.57	56.88	59.95	58.91
08/29/2001	62.42	42.89	82.75	102.00	56.73	60.19	58.84
08/30/2001	64.38	47.53	86.99	103.50	56.88	59.87	58.80
08/31/2001	64.66	50.59	82.36	103.51	56.65	59.64	58.61

BENO == Deschutes River at Benham Falls, OR

Provisional Data - Subject to Change

DATE	QD	WI	WK	WZ
07/13/2001	1983.06	56.18	56.41	56.30
07/14/2001	1949.45	56.10	56.49	56.30
07/15/2001	1908.42	56.25	56.49	56.39
07/16/2001	1887.71	56.33	56.65	56.47
07/17/2001	1853.02	56.41	56.65	56.52
07/18/2001	1771.74	56.25	56.57	56.45
07/19/2001	1728.95	56.10	56.41	56.27
07/20/2001	1725.53	56.02	56.25	56.11
07/21/2001	1708.24	55.86	56.18	56.01
07/22/2001	1692.84	55.86	56.10	55.94
07/23/2001	1677.20	55.78	56.10	55.96
07/24/2001	1638.66	55.78	56.25	56.05
07/25/2001	1617.51	56.02	56.33	56.19
07/26/2001	1629.21	56.18	56.49	56.34
07/27/2001	1655.51	56.25	56.65	56.47
07/28/2001	1656.25	56.41	56.73	56.57
07/29/2001	1656.25	56.49	56.73	56.60
07/30/2001	1685.75	56.33	56.65	56.52
07/31/2001	1689.80	56.18	56.49	56.31
08/01/2001	1655.05	56.02	56.25	56.14
08/02/2001	1632.81	55.94	56.25	56.12
08/03/2001	1634.70	56.02	56.33	56.18
08/04/2001	1648.38	56.10	56.41	56.29
08/05/2001	1649.50	56.18	56.49	56.36
08/06/2001	1647.52	56.25	56.49	56.38
08/07/2001	1700.65	56.25	56.57	56.44
08/08/2001	1769.71	56.41	56.80	56.60
08/09/2001	1819.78	56.65	56.96	56.80
08/10/2001	1846.02	56.73	57.12	56.93
08/11/2001	1853.94	56.80	57.12	56.99

08/12/2001	1865.00	56.80	57.12	57.01
08/13/2001	1870.58	56.88	57.20	57.04
08/14/2001	1871.93	56.88	57.12	57.01
08/15/2001	1872.63	56.80	57.12	57.00
08/16/2001	1878.68	56.88	57.20	57.03
08/17/2001	1883.75	56.96	57.28	57.09
08/18/2001	1883.70	57.04	57.28	57.14
08/19/2001	1882.83	57.04	57.28	57.16
08/20/2001	1882.75	56.96	57.20	57.12
08/21/2001	1881.59	56.96	57.12	57.04
08/22/2001	1882.37	56.88	57.12	56.95
08/23/2001	1874.94	56.73	56.96	56.86
08/24/2001	1839.27	56.65	56.88	56.77
08/25/2001	1763.42	56.57	56.80	56.68
08/26/2001	1728.72	56.49	56.73	56.60
08/27/2001	1719.52	56.41	56.73	56.59
08/28/2001	1712.60	56.41	56.73	56.59
08/29/2001	1707.64	56.41	56.80	56.60
08/30/2001	1704.21	56.41	56.80	56.62
08/31/2001	1699.77	56.49	56.80	56.63


303d listings above 3C Diversion
diversion
Attributes of OR_303d_Streams_0406
RM2 | MILES | HUC_NUM | HUC_NAME | PARKEY | SEASON | SEASONKEY | PARAMETER | ASSMYEAR
222.2 | 189.4 to 222.2 | 17070306 | CROOKED SUBBASINS | 11 | Undefined | 72 | Sedimentation | 1998
189.4 | 189.2 to 189.4 | 17070306 | CROOKED SUBBASINS | 11 | Undefined | 72 | Sedimentation | 1998
189.4 | 189.2 to 189.4 | 17070306 | CROOKED SUBBASINS | 15 | Spring/Summer | 16 | Turbidity | 1998
222.2 | 189.4 to 222.2 | 17070306 | CROOKED SUBBASINS | 15 | Spring/Summer | 16 | Turbidity | 1998
113 | 110.1 to 113 | 17070306, 17070201 | CROOKED SUBBASINS / UPPER DESC | 5 | Summer | 1 | Chlorophyll a | 1998
113 | 110.1 to 113 | 17070306, 17070201 | CROOKED SUBBASINS / UPPER DESC | 10 | Summer | 1 | pH | 1998
99.8 | 48.4 to 99.8 | 17070306 | CROOKED SUBBASINS | 12 | September 1 - June 30 | 8 | Temperature | 2002
48.4 | 0 to 48.4 | 17070306 | CROOKED SUBBASINS | 12 | September 1 - June 30 | 8 | Temperature | 2002
222.2 | 113 to 222.2 | 17070306 | CROOKED SUBBASINS | 6 | January 1 - May 15 | 41 | Dissolved Oxygen | 2004
222.2 | 171.7 to 222.2 | 17070306 | CROOKED SUBBASINS | 5 | Year Around (Non-spawning) | 71 | Dissolved Oxygen | 2004
222.2 | 110.8 to 222.2 | 17070306 | CROOKED SUBBASINS | 12 | Year Around (Non-spawning) | 71 | Temperature | 2004
244.6 | 222.2 to 244.6 | 17070306 | CROOKED SUBBASINS | 12 | Year Around (Non-spawning) | 71 | Temperature | 2004
189.4 | 189.2 to 189.4 | 17070306 | CROOKED SUBBASINS | 5 | Summer | 1 | Chlorophyll a | 2004
99.8 | 48.4 to 99.8 | 17070306 | CROOKED SUBBASINS | 10 | Fall/Winter/Spring | 2 | pH | 2004
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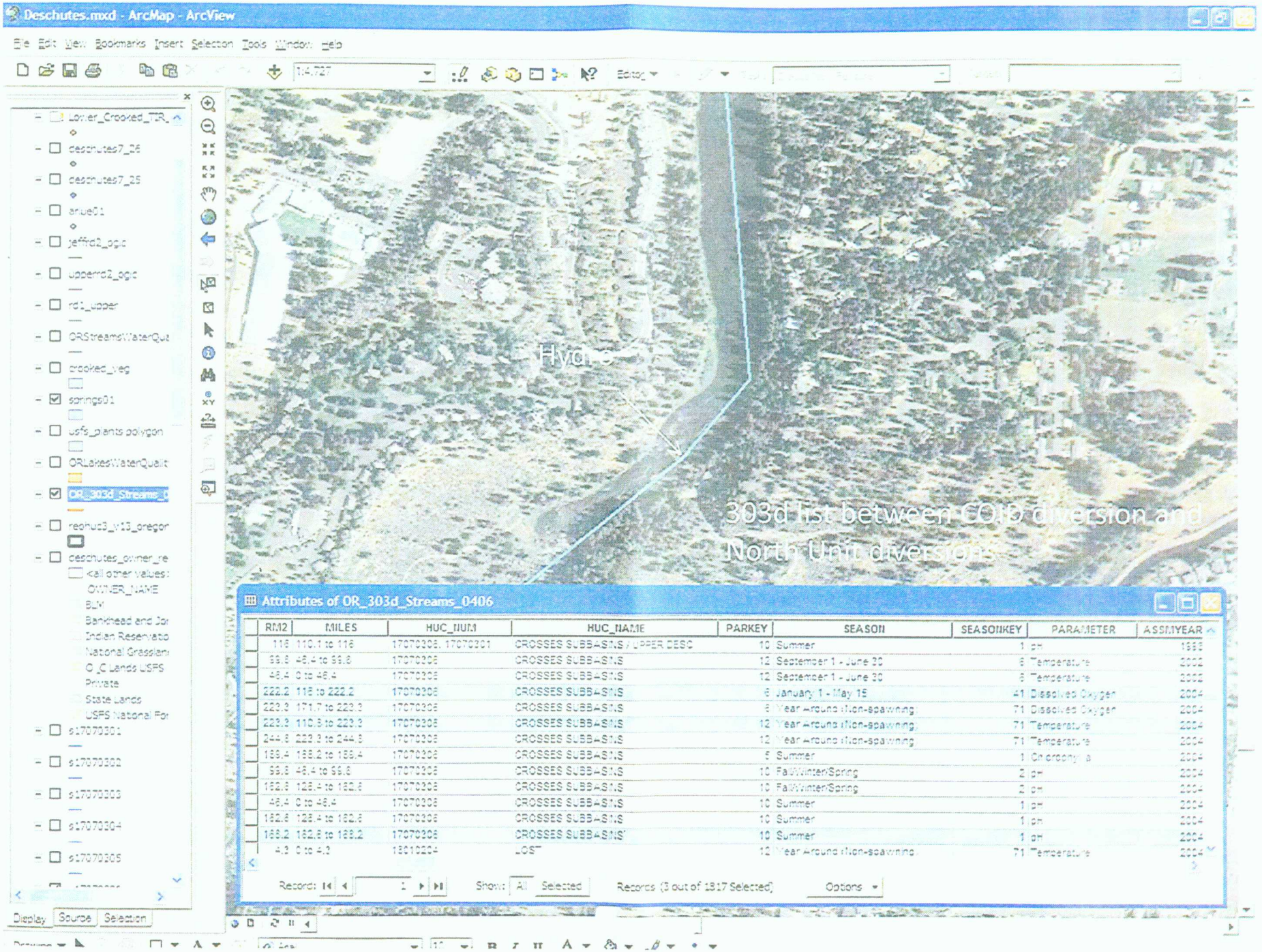
Deschutes.mxd - ArcMap - ArcView
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303d list between COID diversion and North Unit diversions
Attributes of OR_303d_Streams_0406
RM2 MILES HUC_NUM HUC_NAME PARKEY SEASON SEASONKEY PARAMETER ASSMYEAR
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99.8 46.4 to 99.8 17070306 CROSSES SUBBASINS 12 September 1 - June 30 6 Temperature 2004
46.4 0 to 46.4 17070306 CROSSES SUBBASINS 12 September 1 - June 30 6 Temperature 2002
222.2 116 to 222.2 17070306 CROSSES SUBBASINS 6 January 1 - May 15 41 Dissolved Oxygen 2004
223.3 171.7 to 223.3 17070306 CROSSES SUBBASINS 6 Year Around non-spawning 71 Dissolved Oxygen 2004
223.3 110.8 to 223.2 17070306 CROSSES SUBBASINS 12 Year Around non-spawning 71 Temperature 2004
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46.4 0 to 46.4 17070306 CROSSES SUBBASINS 10 Summer 1 pH 2004
162.6 155.4 to 162.6 17070306 CROSSES SUBBASINS 10 Summer 1 pH 2004
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4.3 0 to 4.3 18010204 LOST 12 Year Around non-spawning 71 Temperature 2004
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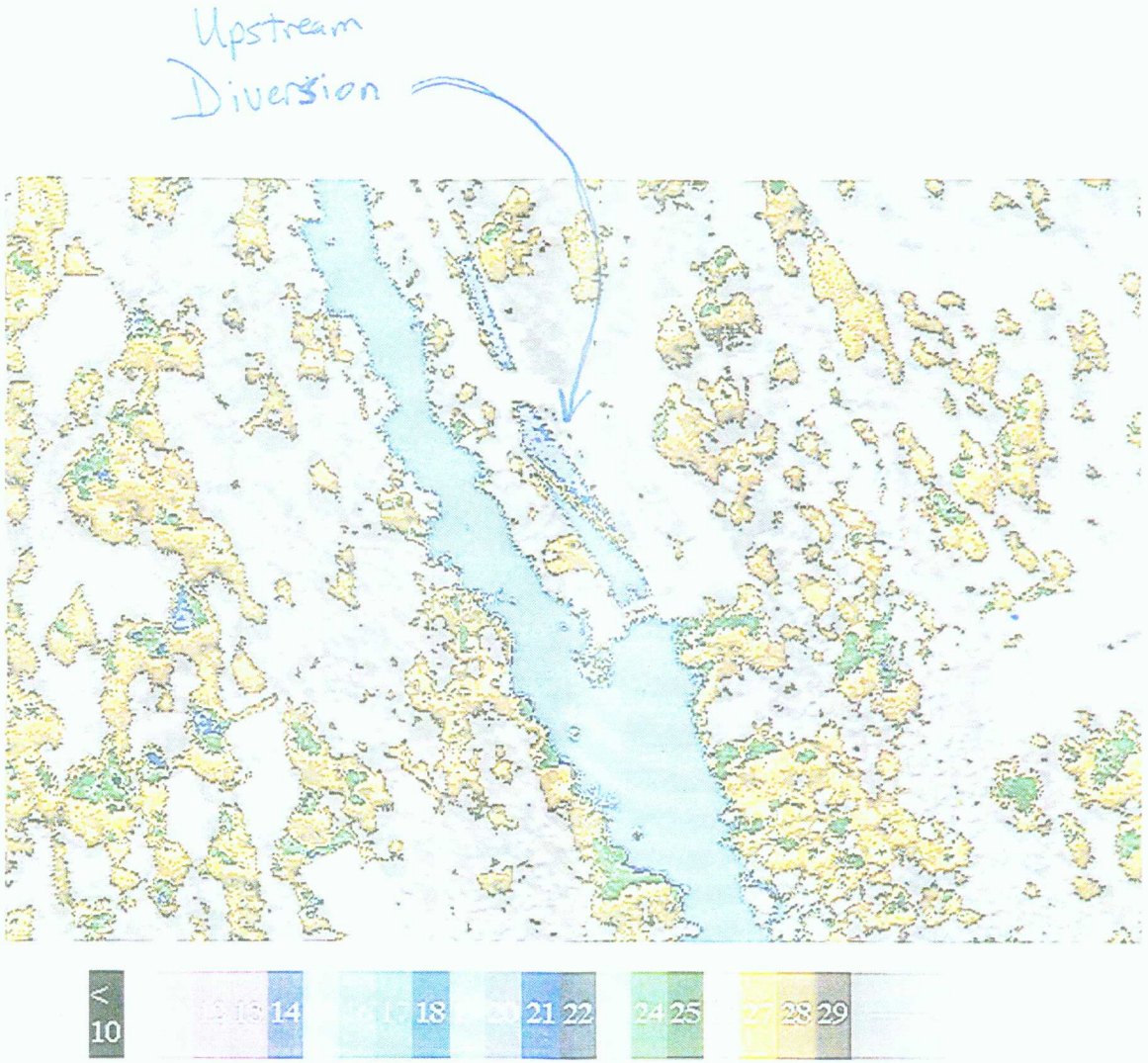
COID diversion


Upstream
Diversion
< 10
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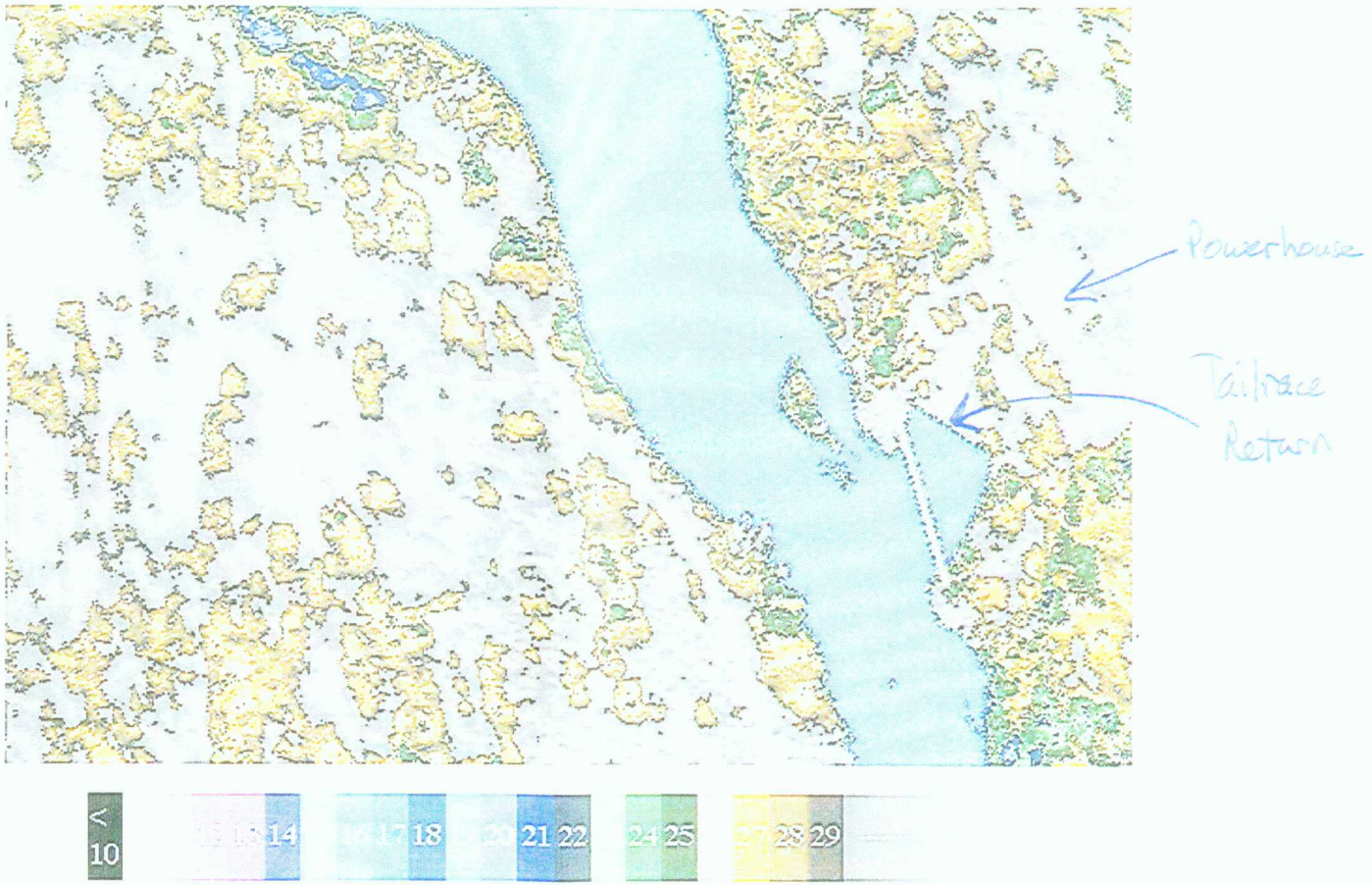
18
21 22
24 25
28 29

COID Hydro return


Powerhouse
Tailrace
Return
< 10
14
18
21 22
24 25
27 28 29


Surface water temperature (deg C)
Distance from mouth (miles)
Mirror Pond footbridge
Hydro
COID diversion
Meadow Camp
Lava Island Falls diversion
Benham Falls footbridge
Note: Stars indicating features are for locational information only. These points do not show stream temperatures.
Deschutes R. (7/25/01)
Bend
Features along the river

Section 22A Waterway Overlay Zone

(1) **Purpose.** The Deschutes River and Tumalo Creek stream corridors within the urban growth boundary of the City of Bend are valuable economic, recreational, scenic and natural resources for the community. The Waterway Overlay Zone (WOZ) is inclusive of all special purpose provisions that pertain to these stream corridors. The WOZ is intended to conserve and enhance the natural resource values of areas along the Deschutes River and Tumalo Creek within the city by:

a) Recognizing and respecting the unusual natural beauty and character of the city's major waterways;
b) Protecting and enhancing water quality for human use and aquatic life;
c) Conserving and restoring habitat for wildlife, fish and other aquatic life;
d) Conserving wetlands;
e) Controlling erosion and reducing the effects of flooding;
f) Improving coordination between the city and agencies regarding development activities near waterways;
g) Promoting development that is compatible with the purposes of the WOZ;
h) Promoting the preservation and restoration of native riparian vegetation;
i) Maintaining the scenic quality of the canyon and rimrock areas along these waterways;
j) Conserving and protecting property values; and
k) Encouraging development, preservation and enhancement of reasonable public access to major waterways for recreational use and visual enjoyment.

(2) **Applicability.** Provisions of this section apply to all property within the boundaries of the WOZ as shown on the Bend Urban Area Zoning Map and consistent with WOZ boundary determination procedures of subsection 3. below. Many parcels within the WOZ are affected by more than one sub-zone. Where this is the case, applicable development standards for each sub-zone shall apply within that sub-zone's boundaries. Standards of this section shall apply in addition to applicable standards of the underlying zone. Where there are conflicts between sub-zone standards, the more restrictive standards shall control. The WOZ includes the following sub-zones:

- Riparian Corridor
- Deschutes River Corridor Design Review
- River Corridor Areas of Special Interest
- Flood Plain

(3) **WOZ Boundary Determination.** The WOZ boundary is inclusive of all WOZ sub-zones, as specified in this section. Except for the River Corridor Areas of Special Interest and the Flood Plain Sub-Zone, the boundary of all sub-zones shall be determined by distance measurement from the designated waterway. The boundary for the River Corridor Areas of Special Interest Sub-Zone is designated on the Bend Urban Area General Plan Map, and shall be considered to be the outer (upland) edge of the mapped boundary line. Unless otherwise provided for specific WOZ sub-zones, boundary measurements shall be made from the ordinary high water mark. Distance measurements shall be made horizontally

and at right angles to the edge of the waterway.

(4) **Tree Removal.** Consistent with the purposes of this section, and because trees contribute to the overall health of the riparian corridor, removal of existing trees greater than 4 inches in diameter within the WOZ is prohibited, except as follows:

a. Where necessary to accommodate an approved development activity; or
b. Where the tree is determined by a qualified professional to be diseased or hazardous; or
c. Where necessary to mitigate potential fire hazard in accordance with the Fire Protection Act of 1997.

Tree removal under this subsection may be authorized by the review authority, based on findings demonstrating conformance with criteria a), b), or c). Where tree removal is proposed apart from an approved development activity, the review authority may authorize removal as a development action. If no hazard will be created, a tree or snag requested for removal may be required to be left in place as wildlife habitat.

(5) **Review Process**

a) **State Agency Coordination.** Within the WOZ, the State of Oregon has jurisdiction over certain development activities. In order to ensure coordination between the City of Bend and affected state agencies, notice of proposed activities within the WOZ will be provided to the Division of State Lands, the Oregon Department of Fish and Wildlife, the Oregon Parks and Recreation Department, and the Department of Environmental Quality, in accordance with provisions of Sec. 10-16.2(8) of the Bend Code.

b) **Application Information.** In addition to application information required under Sec. 10-16.2(2), an application for a development or land use action within the WOZ shall include the following:

A. A detailed written explanation of the proposal, including the location, amount, and type (species) of any vegetation to be removed or planted, and any material to be graded, excavated, or filled.
B. An explanation of why any proposed grading, excavation, or fill of material and/or vegetation is necessary.
C. A site plan drawn to scale, accompanied by such drawings, sketches, photos, and descriptions as are necessary to describe and illustrate the proposed activity. The site plan shall, at a minimum, include:

i. Any proposed structures or impervious surfaces on the site;
ii. Location of property lines, easements, existing and proposed structures;
iii. Identification of existing vegetation on the site, indicating areas of native and non-native plant species;
iv. Any proposed modifications to existing vegetation;

v. A grading and drainage plan, showing existing and proposed site contours at two-foot intervals, or less;
vi. All applicable WOZ sub-zone boundaries;
vii. Location of the ordinary high water mark;
viii. Location of designated wetlands on or abutting the site; boundaries of designated wetlands shall be delineated using methods accepted by the Oregon Division of State Lands;

(6) **Enforcement and Penalties**. In addition to the enforcement and penalty provisions of Sec. 10-10.36, the Review Authority may require the replacement of vegetation removed in violation of the Waterway Overlay Zone. The City may require greater than one-to-one replacement. The amount of replacement trees, shrubs and ground cover shall be determined by the area of removed vegetation. The property owner shall enter into a mitigation agreement plan approved by the City. The mitigation plan shall include:

(a) A mitigation plan providing for the planting and maintenance of the replacement vegetation. The plan shall make provisions for the replacement of plants that die within three years of planting.

(b) Failure to enter into a mitigation agreement plan as required by this section or failure to comply with any condition of that plan shall be a Class A civil infraction. Such failure shall be a separate infraction each day the failure to comply continues. In addition, the City may refuse to accept any development permit application for the subject property or stop work on any development approved for the subject property until an acceptable mitigation plan has been executed or complied with.

(c) In addition to monetary penalties, the City may seek injunctive relief to require the property owner or other responsible party to restore the property to the conditions prior to the violation. The injunctive relief may include imposition of a mitigation plan.

(7) **Replacement of Existing Structures.** Notwithstanding other provisions to the contrary in the City of Bend Zoning Ordinance, in the event that an existing structure is partially or entirely damaged or destroyed by fire, natural disaster or other casualty, the subject structure may be repaired or replaced in the same location provided that additional riparian surface area is not disturbed. A property owner who has been convicted of any degree of arson (including inchoate offenses) in relation to a fire that damages or destroys the subject structure will not be permitted to utilize this Section as a basis for rebuilding the damaged or destroyed structure.

[Section 22A added by ORD NS-1846, passed November 20, 2002]
[Section 22A (7) added by ORD NS-1931, passed July 21, 2004]

NEIL GOLDSCHMIDT
GOVERNOR

Department of Transportation
STATE HISTORIC PRESERVATION OFFICE
Parks and Recreation Division
525 TRADE STREET SE, SALEM, OREGON 97310
March 26, 1987

Ron Nelson
Central Oregon Irrigation District
PO Box 548
Redmond, OR 97756

Dear Mr. Nelson:

RE: FERC Project #3571
Central Oregon Sites
Deschutes County

This letter is in response to your request for official comment from the State Historic Preservation Office regarding impact of your federally funded project on cultural resources.

After a careful review of your proposed project, our office can offer the following comments. We feel the area of the project is not of historic significance and since ground disturbance of previously undisturbed ground is minimal, this office feels that there will be no likely impact to archeological resources. We therefore feel no cultural resource surveys are required and that the project is in compliance with Public Law 89-665 and Executive Order 11593.

For further information regarding projects, contact Leland Gilsen, state preservation archeologist, at 378-5001.

Sincerely,

D.W. Powers III
Deputy SHPO

DWP/LG:jn
3155D

cc: Richard Craven

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Central Oregon Irrigation District — Project No. 3571-014
Oregon

ORDER AMENDING LICENSE

(Issued February 7, 1990)

On April 3, 1989, Tudor Engineering Company, on behalf of the Central Oregon Irrigation District (licensee), filed a request for the deletion of article 410 from the license for the Central Oregon Siphon Project.

Article 410 requires the licensee, after consultation with the National Park Service, the Oregon Parks and Recreation Division and the Bend Metro Park and Recreation District, to develop a plan to monitor whitewater boating use in the bypassed reach of the Deschutes River. The plan is to include specific items and be filed for Commission approval within 1 year from the date of issuance of the license. The items are to include recommendations for changes to project structures or operation needed to accommodate whitewater users.

The licensee states in its filing that it consulted with the required agencies on the development of a monitoring plan for the bypassed reach of the Deschutes River. As a result of the consultation, it requests that article 410 of the project license be deleted. Copies of comments from the agencies are included in the filing.

In its final comment letter dated March 16, 1989, the Bend Metro Park and Recreation District concluded that a monitoring program is not appropriate in the bypassed reach of the Deschutes River. Further, it concurs with the findings of Deschutes County that in-stream recreation in the area is very limited and the rapids of the vicinity are considered life threatening. By letter dated November 23, 1988, the Oregon Parks and Recreation Division stated that it received the comments of the Bend Metro Park and Recreation District and concluded that its concerns have been met. By letter dated December 12, 1988, the National Park Service stated that it is not prepared to say that the bypassed reach receives "very little" use and the studies required under article 410 are unnecessary. However, it would not object if either the Bend Metro Parks and Recreation District or the Oregon Parks and Recreation Division makes such a statement.

Based upon agency comments and other available information, it appears that the bypassed reach is unsuitable for safe whitewater boating. Given the extremely difficult water conditions in the bypassed reach, it is expected to continue to receive only limited use by expert boaters. Given this information, requiring the licensee to monitor this type of use is unwarranted and article 410 should be deleted from the project license. If other information is provided that would indicate that conditions in the bypassed reach are safe or have improved, the Commission should reserve the right to require the licensee to implement the requirements set forth in article 410.

The Director orders:

(A) The request to delete article 410 from the project license filed on April 3, 1989, is approved as modified by paragraph (B) of this order.

(B) The Commission reserves the right to require the licensee to implement the requirements of article 410, in the event that conditions in the bypassed reach change or information is provided that would indicate the need for the study.

(C) This order is issued under the authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.

J. M. R.

J. Mark Robinson
Director, Division of Project Compliance and dministration

BEND METRO
PARK AND RECREATION DISTRICT

PACIFIC PARK LANE
BEND, OREGON 97701
PHONE 389-7275 (PARK)

Vince Genna, Director

May 29, 1990

Arthur C. Martin
Regional Director F.E.R.C.
1120 S.W. 15th Ave., Suite 1340
Portland, OR 97204

Subject: Central Oregon Irrigation Syphon Project

Over the last few weeks I have worked with Ron Nelson at C.O.I.D. to design a program of recreation amenities at the project site. Our plans include the development of a recreation trail which leads to the river along the vehicle access roadway. This trail route then exits to the north along the river on Park District land.

We have been assured by C.O.I.D. that the road along which the recreation trail will be sited will carry only C.O.I.D. maintenance vehicles. This will allow portions of the roadway to be used as trail.

In closing, we are satisfied with the efforts of C.O.I.D. in providing recreation amenities as part of the syphon project.

Sincerely,

Vince Genna
Director

VG:krm
cc: Ron Nelson
Central Oregon
Irrigation District

NEIL GOLDSCHMIDT
GOVERNOR

PARKS & RECREATION DEPARTMENT

Region 4

63055 N. HWY 97, BEND, OREGON 97701 PHONE 388-6211

June 11, 1990

Mr. Ron Nelson
Central Oregon Irrigation District
P.O. Box 548
Redmond, OR 97756

Dear Ron:

Thank you for your time in showing us the river access trail that was developed in conjunction with the new syphon project.

I spoke with Vince Genna about the future plans Bend Metro Parks has for loop trails and how your system will fit in with theirs. Vince and I concurred that what you have done is an asset to the entire system and we appreciate your cooperation in providing this facility.

We would like to keep open the option of moving the trail off the Maintenance Road when, and if, properties become available to do so. We realize that with the existing terrain, and adjacent property ownerships, that this may not be possible for some time.

Thank you, again, for your efforts in this project. The C.O.I.D. Syphon Project is deserving of praise for its aesthetic appeal and the provision of river access.

Sincerely,

Jan K. Ernst
Coordinator

/jke

cc: Al Cook
Gerald Lucas