



Oregon

Kate Brown, Governor

Water Resources Department

North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

MEMORANDUM

TO: Water Resources Commission

FROM: Dwight French, Water Right Services Administrator

DATE: Agenda Item E, March 12, 2015
Water Resources Commission Meeting

Deschutes Basin Ground Water Mitigation Program 2013 Annual Report

I. Issue Statement

This report, required by OAR 690-505-0500(3) and OAR 690-521-0600, provides the 2013 annual evaluation of the Deschutes Ground Water Mitigation Rules (OAR Chapter 690, Division 505) and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules (OAR Chapter 690, Division 521).

II. Background

On September 13, 2002, the Commission adopted the Deschutes Ground Water Mitigation Rules and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules. These rules implement Senate Bill 1033 (1995), House Bill 2184 (2001), House Bill 3494 (2005), and most recently House Bill 3623 (2011). The rules provide for mitigation of impacts to scenic waterway flows and senior water rights, while allowing additional appropriations of groundwater in the Deschutes Ground Water Study Area (see Attachment 1).

The Deschutes Ground Water Mitigation Rules allow groundwater users to provide mitigation through an individual mitigation project, a mitigation credit holder, or an approved mitigation bank. The Deschutes Basin Mitigation Bank and Mitigation Credit Rules authorize the establishment of a mitigation credit system and mitigation banks to help facilitate transactions among holders of mitigation credits and persons interested in acquiring mitigation credits.

On June 4, 2010, the Commission adopted the Deschutes Basin Water Management Rules (OAR 690-522), which operate in conjunction with the Deschutes Ground Water Mitigation Rules and the Deschutes Basin Mitigation Bank and Mitigation Credit Rules. The Deschutes Basin Water Management Rules changed how the Department counts new groundwater permit applications under the allocation cap and allowed some unused mitigation credits to be reassigned. The rules also clarified how municipal and quasi-municipal permit holders can provide mitigation under incremental development plans, and allowed additional flexibility to use “offsets” and move mitigation credits between permits.

During the 2011 Legislative session, House Bill 3623 extended the January 2, 2014 sunset on the mitigation program to January 2, 2029. The Department is required to report to the Legislature

every five years on the outcomes of the Mitigation Program. The first report to the Legislature is due in 2016.

III. Program Highlights

- 101 active permits and certificates have been issued under the Mitigation Program.
- As of the end of 2013, approximately 135 cubic feet per second (cfs) of water had been allocated under new permits and approved final orders. This leaves 65 cfs that can still be approved under the 200 cfs allocation cap.
- The majority of mitigation is from permanent mitigation projects (instream transfers).
- More mitigation has been in place on an annual basis in each zone of impact than needed for groundwater permits and certificates under the mitigation program.
- Model results through 2013 suggest that instream flows have improved compared to base line conditions on an annual basis.

IV. Discussion

Under the Deschutes Ground Water Mitigation Rules, the Department is required to annually evaluate the Mitigation Program, including the implementation and management of mitigation credits allocated through existing mitigation banks. The Mitigation Program in the Deschutes Ground Water Study Area continues to address new and changing water needs, while protecting scenic waterway flows. Mitigation Program activities are summarized below.

A. New Groundwater Appropriations and Mitigation Activities

Permits Issued: Since adoption of the mitigation rules in September 2002, a total of 105 groundwater permits with associated mitigation have been issued. Four of these permits have been cancelled. Four permits have been issued certificates. Six new permits that were issued in 2013 are summarized in Attachment 2.

Applications with Final Orders: By the end of 2013, 14 groundwater permit applications had been processed to the final order stage. Permits will be issued when the required mitigation or any other required information (such as permit recording fees) is provided. Upon issuing a final order approving a new groundwater use, the applicant has five years to provide the required mitigation. Once mitigation obligations are met, the Department issues the groundwater permit and the new permit holder may begin using water. Groundwater use may not begin until a permit is issued. If mitigation is not provided within the five-year timeline, the final order expires. As of year-end 2013, a total of 19 final orders had expired resulting in 9.76 cfs being added back into the 200 cfs allocation cap.

Pending Applications: There are another 35 pending applications for groundwater use in the Deschutes Ground Water Study Area. Attachment 3 provides a breakdown of the pending applications and their status.

Allocation Cap Summary: The amount of new groundwater use that can be approved under the program is limited to a total of 200 cfs. As of the end of 2013, approximately 135 cfs of water had been allocated under new permits and approved final orders. This leaves 65 cfs that can still be approved under the 200 cfs allocation cap. At the end of 2013, there was an additional 41.1 cfs in pending applications which, if approved, would leave 23.9 cfs available under the 200 cfs cap.

The Department has identified a need for additional modifications to the Deschutes Basin Water Management rules in Division 522. In OAR 690-522-0030, the rules currently restrict the statute under which a permit may be cancelled and its water added back to the allocation cap to ORS 537.410. This cancellation process is not frequently used by the Department. Cancellations are more routinely processed under the authority of ORS 537.260. Moreover, the provision in the rules does not allow water associated with permits that are voluntarily cancelled to be added back to the 200 cfs allocation cap. Currently, there are four permits (0.418 cfs) that have been cancelled, three of which were voluntarily cancelled, and are still accounted for under the allocation cap.

This issue was highlighted as part of the 2012 annual evaluation and 5 year evaluation of the mitigation program presented to the Commission in March 2014. During that meeting, the Commission directed staff to initiate rulemaking to clarify how the Department adds water back to the allocation cap and reestablishes mitigation credits based on cancellation of a permit. The Department is currently pursuing rulemaking for Division 522 to broaden this restriction to include both cancellation processes, and to authorize the Department to add water from voluntarily cancelled permits back to the 200 cfs allocation cap. The Department expects to bring the modified rules for adoption by the Commission at the June meeting.

Incremental Development Plans: By rule, the Department may allow a municipal or quasi-municipal applicant to supply mitigation incrementally, over a period of time, as the water use is developed rather than requiring that all mitigation be provided before the permit is issued. A total of 13 permits with incremental development plans have been approved, including one new permit issued in 2013. The amount of mitigation provided must coincide with the rate of development within each increment. Each permit holder must have an incremental development plan on file with the Department and may amend that plan with prior approval by the Department. The Division 522 rules clarify how municipal and quasi-municipal permit holders may grow into each increment. Municipal and quasi-municipal permit holders must include the annual volume of water used and the source of mitigation used as part of their annual reporting requirements. A summary of water use for municipal and quasi-municipal permit holders is provided in Attachment 4.

Overall, in 2013, more mitigation was provided by entities with incremental development plans than was needed based on reported water use levels (see Attachment 4). Total mitigation provided was 1,472.9 AF and the amount of mitigation needed based on reported use was 775.0 AF. There were two permit holders in 2013 that used more water than was officially covered by mitigation. In one case, the permit holder has since reconciled their

use with additional mitigation. The other incremental water user did not provide additional mitigation. The Department will work with this permit holder to assure that additional mitigation is provided and regulate the use, if needed.

B. Mitigation Activity

Mitigation for active groundwater permits and certificates issued by the Department under the Mitigation Program is being provided through permanent instream transfers and temporary instream leases.

- The majority of mitigation water continues to be primarily from instream transfers. Mitigation is considered used when assigned to a groundwater application or permit. Attachment 5 provides a summary of the amount of permanent and temporary mitigation provided in 2013 and the amount of mitigation used in 2013.
- The amount of mitigation water used each year is less than the full amount of mitigation required by permits and certificates, primarily because municipal and quasi-municipal permit holders can provide mitigation incrementally. In 2013, the full mitigation obligation of all permits/certificates was 12,648.3 AF, of which 9,854.9 AF (78%) was associated with municipal and quasi-municipal permits. However, in 2013, approximately 2,591.7 AF of mitigation water was needed to meet consumptive use by municipal and quasi-municipal water users under the Mitigation Program. The municipal and quasi-municipal permit holders provided 3,189.62 AF of mitigation, meaning that these permit holders are not only meeting their mitigation requirements but also that those with incremental development plans are providing mitigation in advance of actual need. Attachment 6 highlights the amount of mitigation required and the amount of mitigation provided for all permits and certificates.

Each January, the Deschutes River Conservancy (DRC) Mitigation Bank submits a report detailing all of the credit transactions and activities for the preceding calendar year. Generally, the DRC Mitigation Bank has operated with temporary mitigation credits based on instream leases. In all cases, the DRC Mitigation Bank has maintained sufficient “reserve” credits to cover temporary mitigation credits used by groundwater permit holders in each zone of impact. In 2013, the DRC Mitigation Bank completed 35 mitigation credit transactions with groundwater permit holders and permit applicants.

In 2013, there were 50 active mitigation projects. These were comprised of 18 instream leases (submitted by the DRC Mitigation Bank) and 32 permanent instream transfers (submitted by other parties). Attachment 7 provides a summary of groundwater permit and mitigation activity for 2013 by zone of impact and demonstrates that more mitigation (including unused mitigation) is in place than required in each of the zones of impact. As of year-end 2013, there were 11 permits that completely switched from temporary mitigation credits to permanent credits. Four other permits partially switched to permanent mitigation credits.

In 2013, five permits issued with a mitigation obligation totaling 51.5 AF failed to provide mitigation. The source of mitigation for each of these permits had previously been temporary credits from the Deschutes River Conservancy Mitigation Bank. Each groundwater permit holder is required by rule and by permit condition to provide mitigation for the life of the groundwater permit, and subsequent certificate.

One of these permit holders has since provided mitigation for 2014 and is no longer delinquent. The Department will continue to work with the other permit holders to ensure that mitigation is secured. In the meantime, permit holders are not allowed to irrigate, and if compliance does not occur, the Department will pursue cancellation.

The Department reported previously on several other permits that failed to continue providing mitigation:

- Two permit holders who previously had not provided mitigation in 2012, provided mitigation in 2013.
- One permit was cancelled by the Department in 2012 as a result of failure to provide mitigation and non-submission of a claim of beneficial use.
- Two permits were voluntarily cancelled by the permit holders in 2008 and 2009.
- One other permit holder that failed to provide mitigation, reestablished mitigation with the Deschutes River Conservancy Mitigation Bank in 2011 and has since been providing mitigation consistently.

C. Mitigation and Streamflow Monitoring

To monitor the impact of new groundwater permits and mitigation on scenic waterway flows and instream water right flows, the Department developed a streamflow modeling program. The model was constructed using a base-period of flows from 1966 to 1995 at selected gaging stations around the basin. This base-period represents streamflows during a period of time after the dams in the basin were constructed and before the Scenic Waterway Act was amended to include consideration of groundwater impacts. The model then applies the effect of the estimated hydrologic impact of mitigation credits and debits to this historical data. It should be noted that the model is designed only to reflect the theoretical response of streamflow to mitigation-related activities. No attempt has been made to reflect other streamflow restoration activities such as instream transfers or riparian enhancement activities.

Analysis of the 2013 data demonstrates that, on an annual basis, the change in percent of time the instream flow requirements are met at the evaluation points is predominantly positive, ranging from -0.12% to +0.66% (see Attachment 8). Similarly, the overall annual change in streamflow is positive (+16.9 cfs) above Lake Billy Chinook to slightly negative below (-2.03 cfs). Consistent with previous evaluations of the mitigation program, the absolute change in streamflow on a seasonal basis continues to be negative at all evaluation points during the non-

irrigation season and positive at all evaluation points during the summer. This is expected given the timing difference between the effects of new groundwater withdrawals and mitigation projects (i.e. instream transfers and leases) on streamflow. New groundwater uses produce a decrease in streamflow that is uniformly distributed over the year, while mitigation projects generally increase streamflow only during the irrigation season (Attachment 8).

The seasonal changes in percent of time the instream flow requirements (ISFR) are met at each evaluation site follows the seasonal impacts in terms of absolute streamflow. During the non-irrigation season, the impact to the percent of time the ISFR is met is generally negative while the percent of the impact during the irrigation season is predominantly positive. The relative change in percent of time the ISFR is met varies by month and site, depending on how close the historical flows were to the ISFR prior to the mitigation program. If the historical flows were close to the ISFR for a given evaluation site, then a small change in flows can relate to a relatively large change in percent of time the ISFR is met (see summer flows for the Deschutes River at Lower Bridge, Attachment 8). The opposite is true if the historical flows differed greatly from the ISFR (see summer flows for the Deschutes River at Lake Billy Chinook, Attachment 8).

The Department has also noted small negative changes in streamflow on an annual basis at certain evaluation points (see Attachment 8). For example, for the Deschutes River below Pelton and at the mouth, there appears to have been an annual reduction in streamflows of -2.03 cfs, which is only 0.04 percent of the mean annual streamflow and not measurable. This is in part due to the resolution of the model and a small amount of mitigation project return flows that may occur outside of the study area.

Another consideration is related to how groundwater permits and mitigation projects are entered into the streamflow model. The model assumes full use by groundwater permit holders. However, not all permit holders are required to provide their full amount of mitigation before the permit is issued. In the case of municipal and quasi-municipal permit holders, they have the option of providing mitigation incrementally to match the development of the permit over time. The amount of mitigation provided and entered into the streamflow model is currently less than what all permits issued under the mitigation program will need at full use levels. However, these users are providing more mitigation than required at current use levels. For example, in the General Zone of Impact, in 2013, the maximum amount of consumptive use allowed by municipal and quasi-municipal permit holders with incremental development plans was 6,987 AF. However, the authorized consumptive use level under incremental development was 1,095 AF, and the amount of mitigation provided by these users was 676 AF. Based upon 2013 reported annual use levels, these permit holders in the General Zone of Impact appear to have only needed about 518 AF of mitigation. There is a similar situation in each of the zones of impact.

Over time, as municipal and quasi-municipal permits with incremental mitigation plans and their mitigation are developed and added to the streamflow model, the Department anticipates that the annual change will move towards a more accurate reflection of the changes to streamflow. The

Department will continue to evaluate streamflow model results on an annual basis to determine whether streamflows continue to be met on an equivalent or more frequent basis.

V. Summary

The Department continues to work hard to effectively implement the Deschutes Ground Water Mitigation Program. Groundwater permit applications and mitigation projects are moving through the required processes. The program is producing positive benefits as more mitigation water has been approved and protected instream than required for the 101 active groundwater permits and certificates issued.

As mentioned in Section IV (A), the Department is currently pursuing rulemaking to broaden limitations on adding water back to the allocation cap and reassigning permanent mitigation credits based on permit cancellation. The Department has held a Rules Advisory Committee meeting and is currently seeking public input on the proposed rules.

Model results through 2013 suggest that instream flows have improved compared to base line conditions on an annual basis. Seasonally, the mitigation effects on the instream requirements are negative during the non-irrigation season and positive during the irrigation season. These differences in seasonal effects are inherent in the mitigation program and will continue into the future. The relative impact to the percent of time the ISFR are met on a monthly basis depends on how close the ISFR is to the pre-mitigation streamflow and varies by each evaluation site.

VI. Recommendation

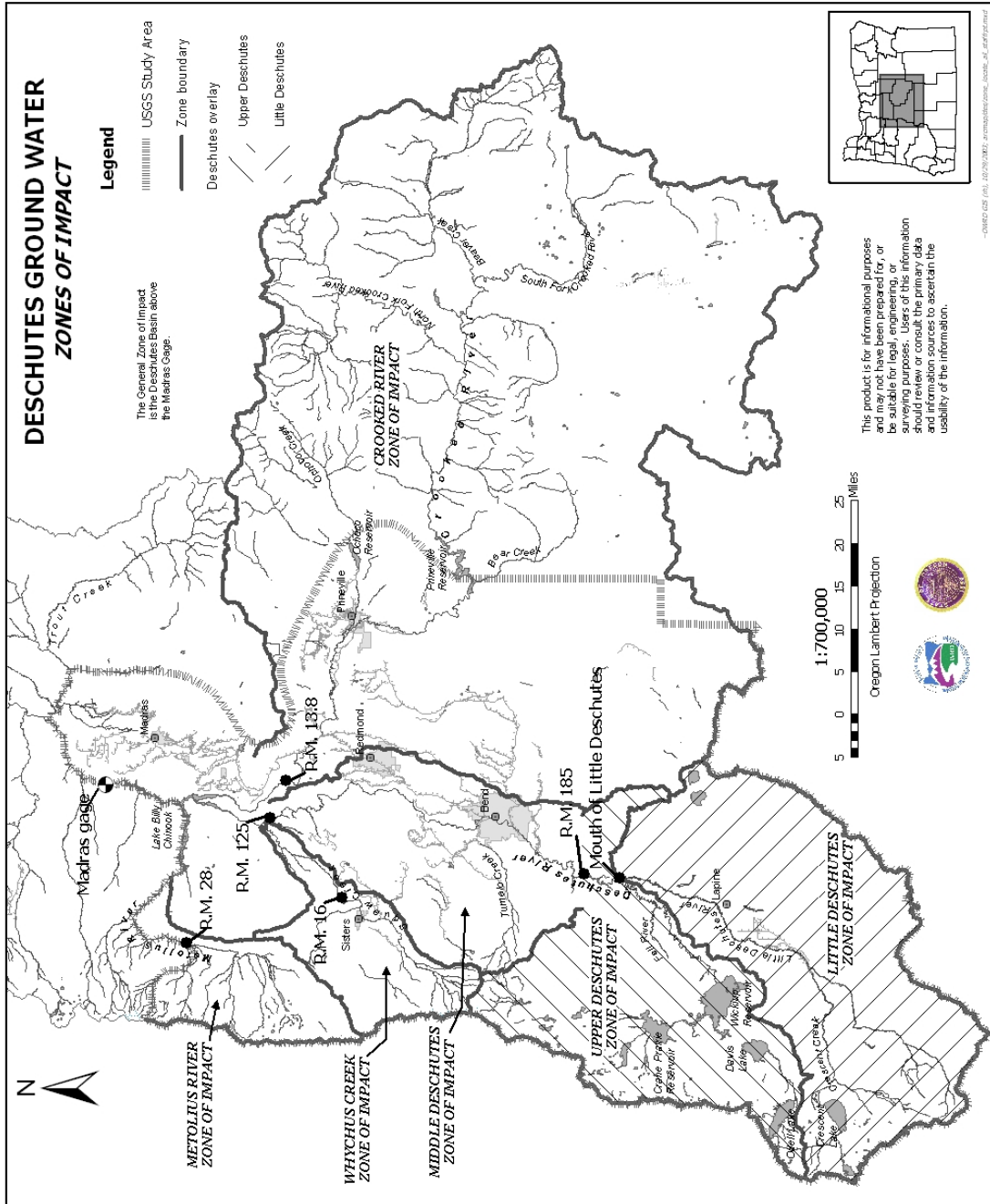
This is an informational report. No Commission action is required.

Attachments:

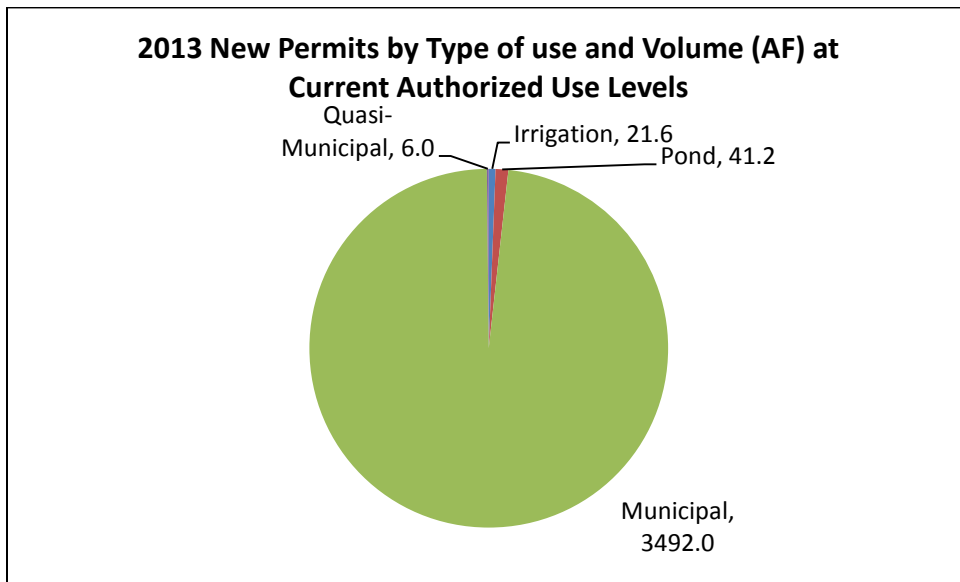
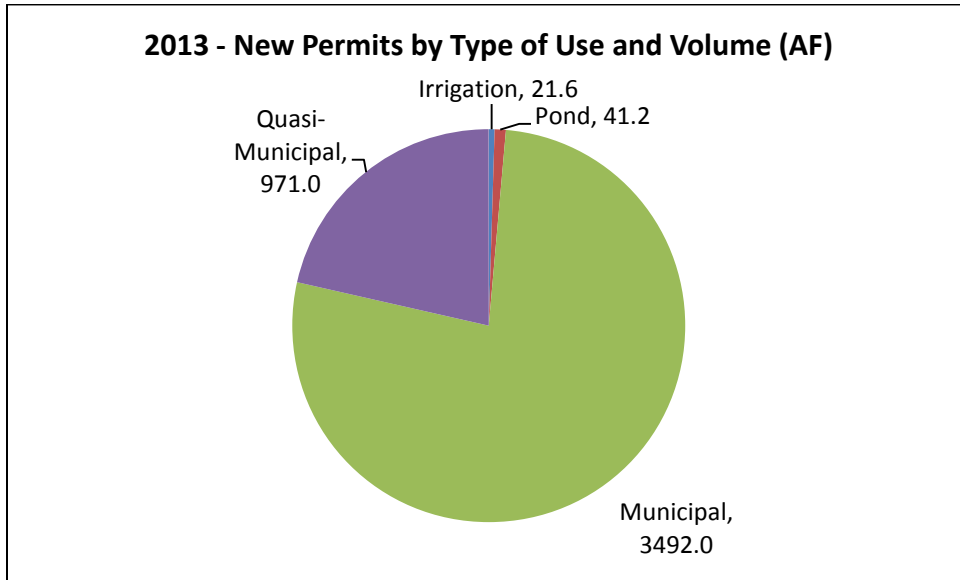
1. Deschutes Ground Water Study Area Zone of Impact Map
2. New Permits Issued in 2013
3. Status of Pending Groundwater Applications
4. Summary of Permits with Incremental Development Plans
5. Mitigation Water Established and Used in 2013
6. Summary of Mitigation Obligations and Use Levels for 2013
7. Summary of Mitigation Activity for 2013
8. Summary of streamflow for Water Year Ending September 2013

Dwight French
503-986-0819

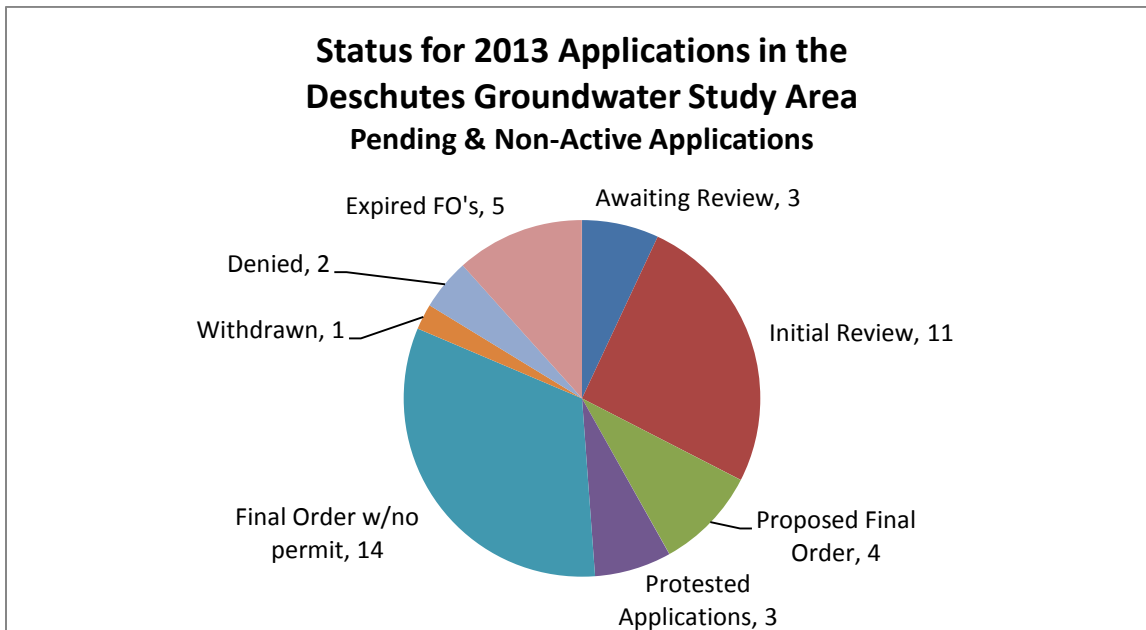
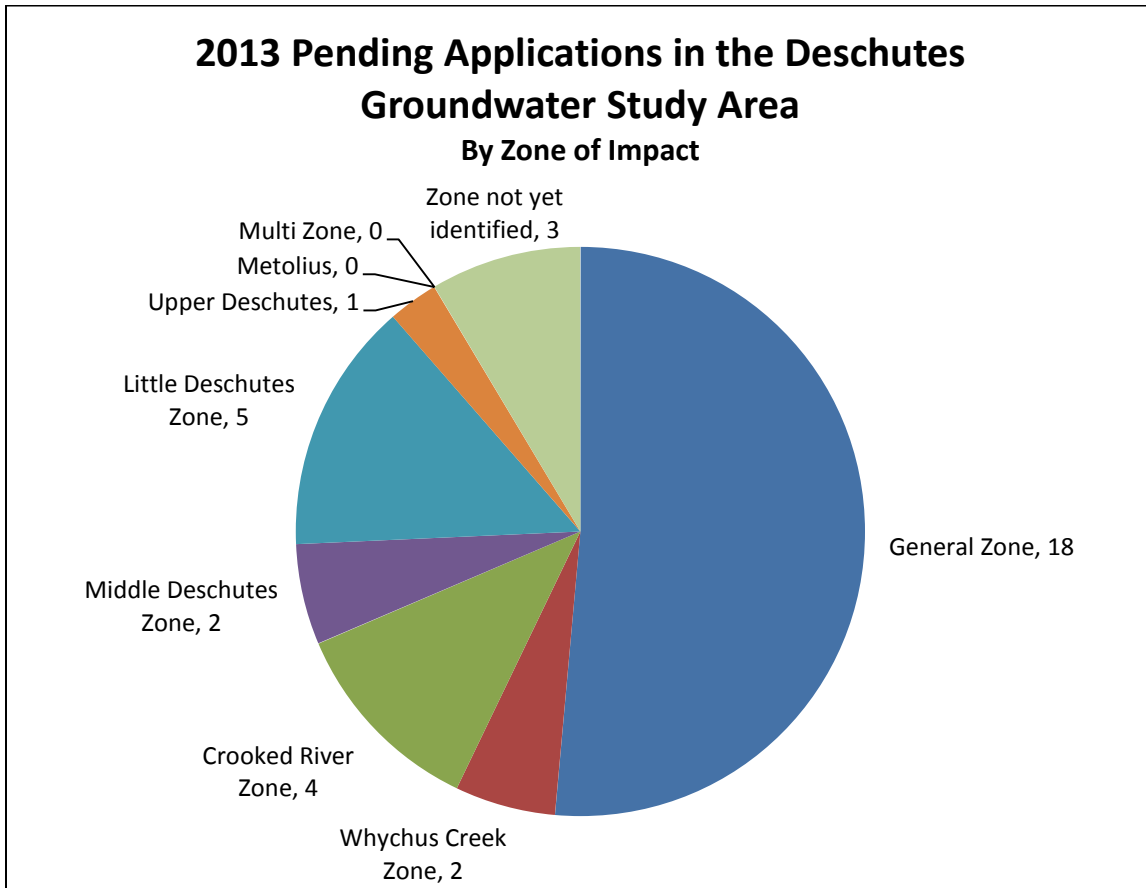
Laura Wilke
503-986-0884



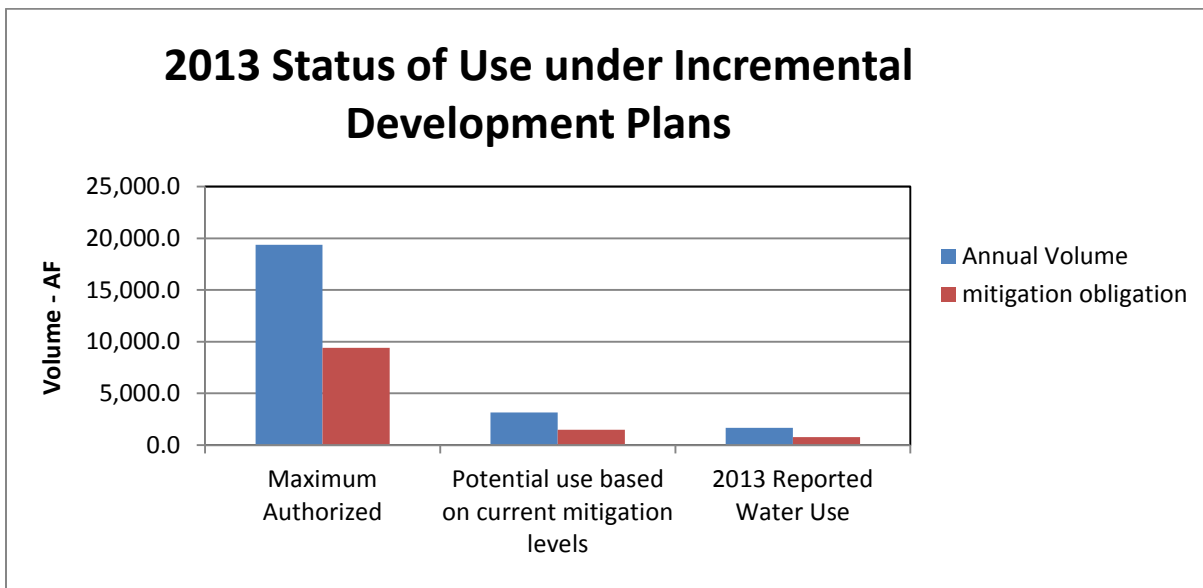
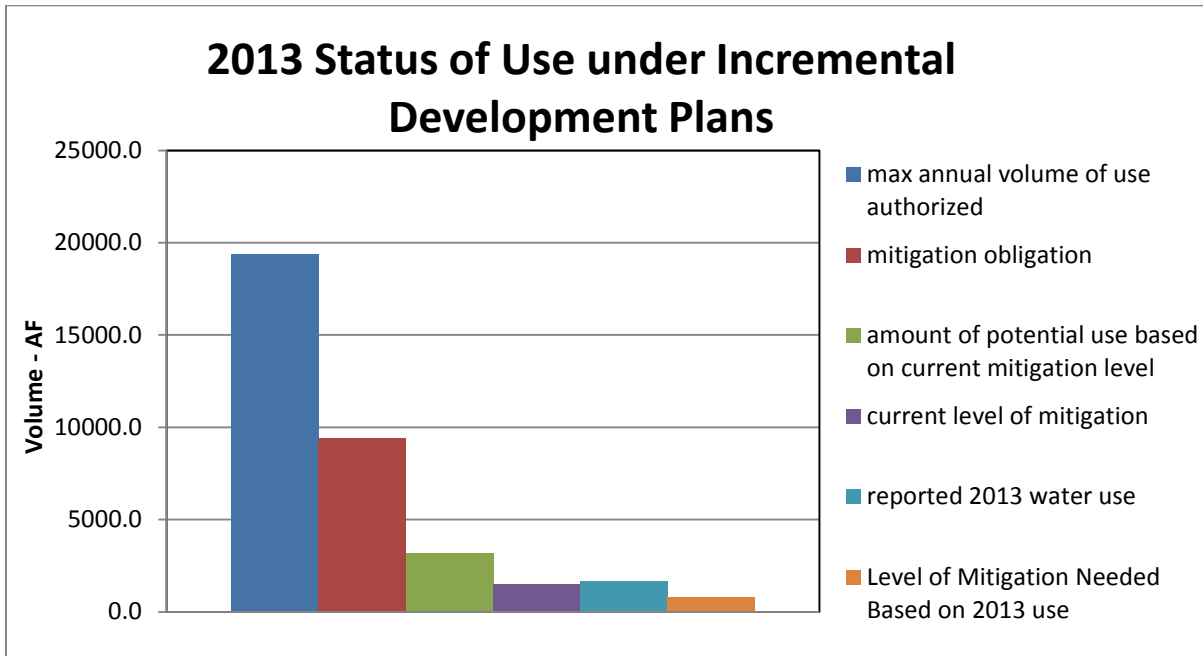
New Permits Issued in 2013



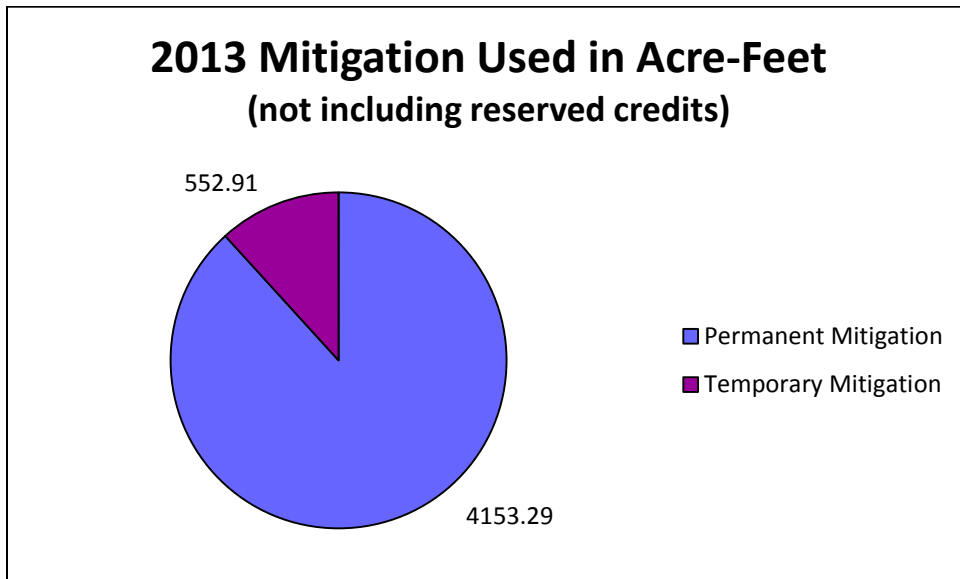
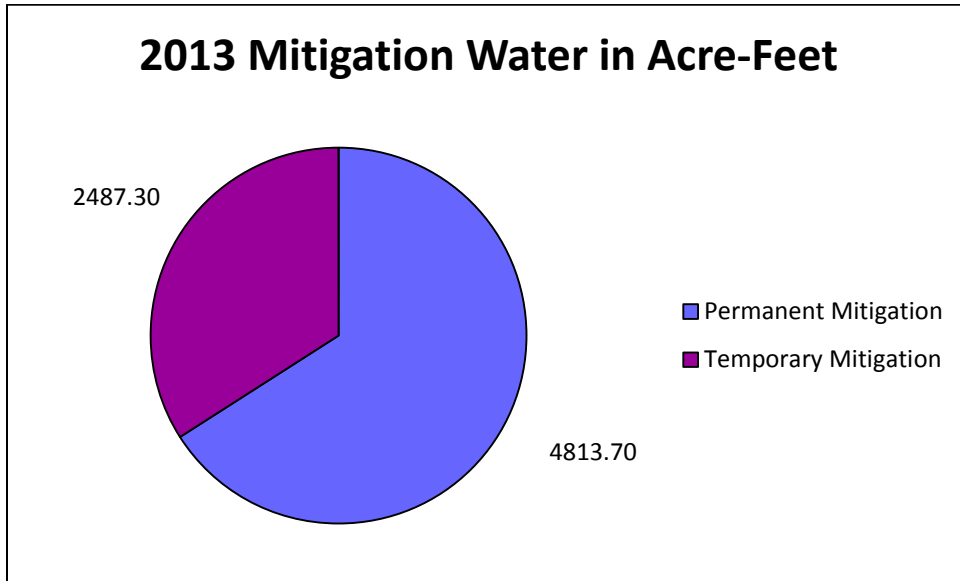
Status of Pending Groundwater Applications as of 12/31/2013



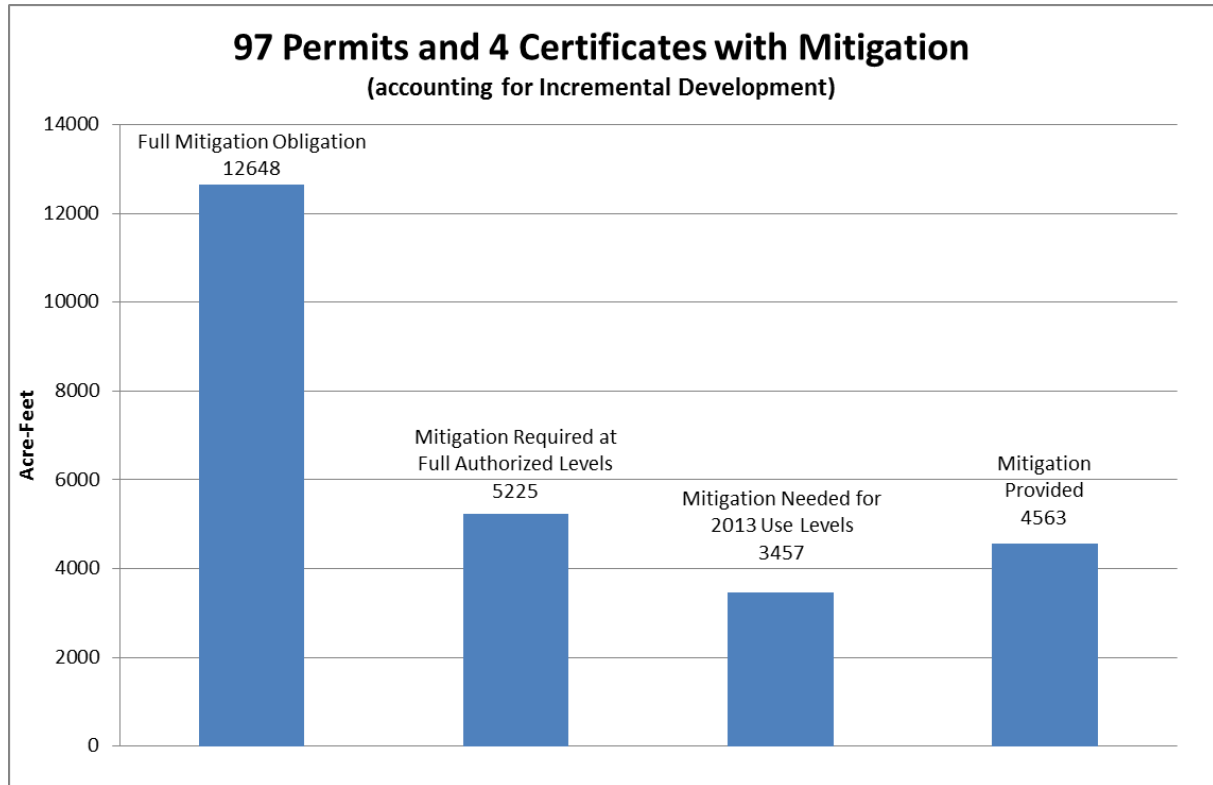
Summary of Permits with Incremental Development Plans



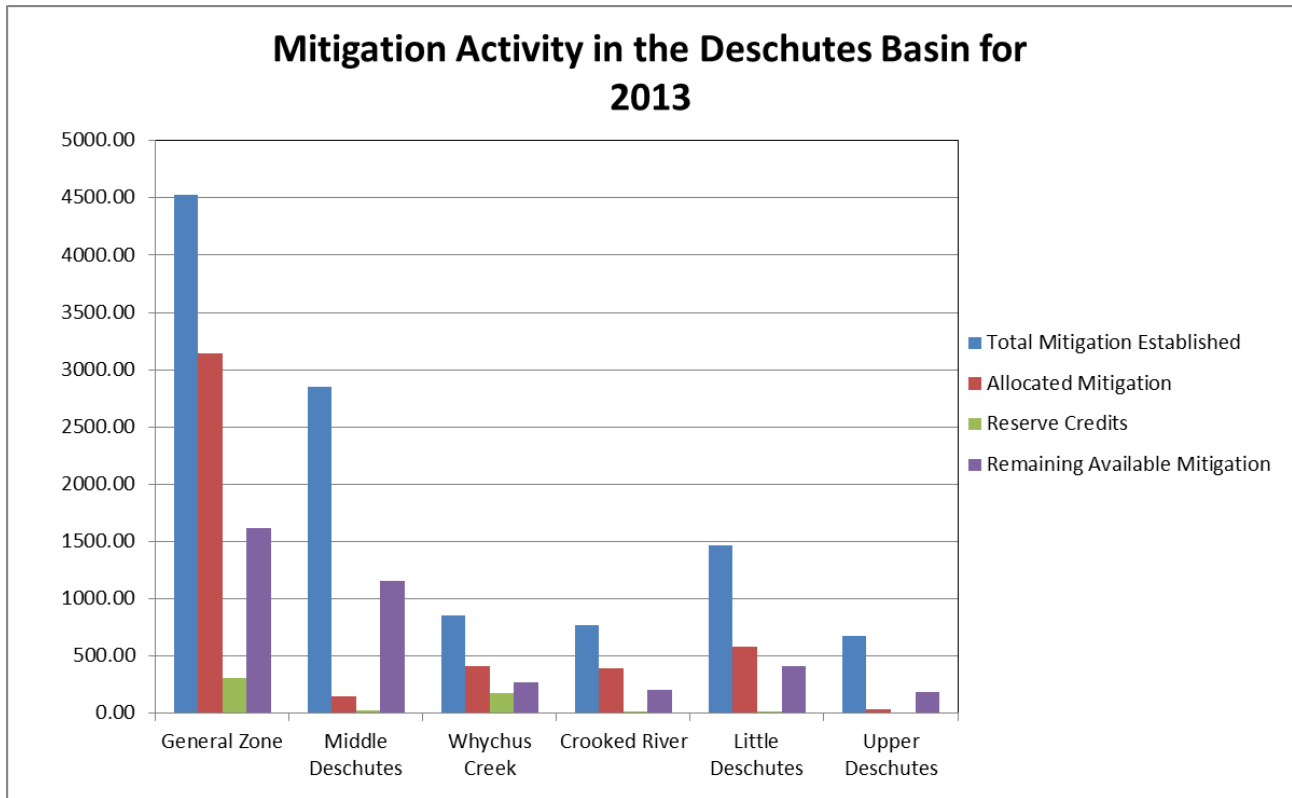
Mitigation Water Established and Used in 2013



Summary of Mitigation Obligations and Use Levels for 2013



Summary of Mitigation Activity for 2013



**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Mouth

Time: 12.41

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	93.20	93.10	-0.11
February	90.80	90.40	-0.35
March	95.30	95.10	-0.22
April	99.90	99.60	-0.33
May	99.10	99.10	0.00
June	98.00	98.70	+0.67
July	91.00	92.70	+1.72
August	100.00	100.00	0.00
September	98.10	98.10	0.00
October	97.40	97.40	0.00
November	99.90	99.90	0.00
December	91.70	91.10	-0.64
Annual	96.20	96.30	+0.06

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Mouth

Time: 12.41

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	6910.00	6890.00	-24.30	-0.35
February	7080.00	7050.00	-24.30	-0.34
March	7250.00	7220.00	-24.30	-0.34
April	6640.00	6630.00	-9.78	-0.15
May	5800.00	5810.00	+7.33	+0.13
June	5200.00	5220.00	+22.10	+0.42
July	4590.00	4620.00	+26.60	+0.58
August	4380.00	4410.00	+25.80	+0.58
September	4430.00	4450.00	+17.20	+0.39
October	4710.00	4710.00	+6.23	+0.13
November	5390.00	5370.00	-24.00	-0.45
December	6190.00	6160.00	-24.30	-0.40
Annual	5710.00	5700.00	-2.03	-0.04

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River below Pelton Dam

Time: 12:33

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	64.70	64.10	-0.64
February	63.00	62.20	-0.83
March	67.80	66.90	-0.97
April	71.40	70.70	-0.78
May	58.80	62.30	+3.44
June	55.60	59.10	+3.56
July	41.00	43.90	+2.90
August	98.20	99.00	+0.86
September	66.80	67.60	+0.78
October	81.10	81.10	0.00
November	97.20	97.20	0.00
December	66.10	65.50	-0.64
Annual	69.30	70.00	+0.65

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River below Pelton Dam

Time: 12:40

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	5240.00	5220.00	-24.30	-0.47
February	5190.00	5170.00	-24.30	-0.47
March	5520.00	5500.00	-24.30	-0.44
April	5130.00	5120.00	-9.78	-0.19
May	4420.00	4430.00	+7.33	+0.17
June	4230.00	4250.00	+22.10	+0.52
July	4020.00	4050.00	+26.60	+0.66
August	3940.00	3960.00	+25.80	+0.65
September	3980.00	3990.00	+17.20	+0.43
October	4190.00	4200.00	+6.23	+0.15
November	4680.00	4660.00	-24.00	-0.51
December	5030.00	5010.00	-24.30	-0.49
Annual	4630.00	4630.00	-2.03	-0.04

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2013

Metolius River at Lake Billy Chinook

Time: 12:42

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	97.70	97.70	0.00
February	99.20	99.20	0.00
March	99.80	99.80	0.00
April	100.00	100.00	0.00
May	100.00	100.00	0.00
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	100.00	100.00	0.00
October	100.00	100.00	0.00
November	100.00	100.00	0.00
December	100.00	100.00	0.00
Annual	99.70	99.70	0.00

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2013

Metolius River at Lake Billy Chinook

Time: 12:42

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	1510.00	1510.00	0.00	0.00
February	1560.00	1560.00	0.00	0.00
March	1560.00	1560.00	0.00	0.00
April	1520.00	1520.00	0.00	0.00
May	1560.00	1560.00	0.00	0.00
June	1590.00	1590.00	0.00	0.00
July	1490.00	1490.00	0.00	0.00
August	1400.00	1400.00	0.00	0.00
September	1350.00	1350.00	0.00	0.00
October	1330.00	1330.00	0.00	0.00
November	1370.00	1370.00	0.00	0.00
December	1450.00	1450.00	0.00	0.00
Annual	1470.00	1470.00	0.00	0.00

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Lake Billy Chinook

Time: 12:43

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	100.00	100.00	0.00
February	100.00	100.00	0.00
March	100.00	100.00	0.00
April	97.10	99.60	+2.44
May	100.00	100.00	0.00
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	100.00	100.00	0.00
October	94.40	99.80	+5.38
November	100.00	100.00	0.00
December	100.00	100.00	0.00
Annual	99.30	99.90	+0.66

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Lake Billy Chinook

Time: 12:43

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	1300.00	1290.00	-7.01	-0.54
February	1320.00	1310.00	-7.01	-0.53
March	1300.00	1290.00	-7.01	-0.54
April	843.00	850.00	+7.53	+0.89
May	552.00	575.00	+23.10	+4.01
June	606.00	642.00	+35.40	+5.51
July	550.00	590.00	+39.70	+6.74
August	519.00	558.00	+38.90	+6.96
September	537.00	568.00	+30.30	+5.34
October	725.00	745.00	+19.90	+2.67
November	1130.00	1120.00	-7.01	-0.63
December	1220.00	1210.00	-7.01	-0.58
Annual	881.00	894.00	+13.40	+1.50

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Lower Bridge

Time: 12:43

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	60.50	59.00	-1.51
February	63.80	62.50	-1.30
March	68.30	67.80	-0.43
April	23.60	24.10	+0.56
May	1.29	1.29	0.00
June	2.11	3.11	+1.00
July	0.11	0.54	+0.43
August	0.86	1.40	+0.54
September	3.67	4.00	+0.33
October	13.00	14.20	+1.18
November	52.20	50.90	-1.33
December	56.30	55.90	-0.43
Annual	28.60	28.60	-0.07

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Lower Bridge

Time: 12:44

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	683.00	682.00	-1.42	-0.21
February	705.00	704.00	-1.42	-0.20
March	714.00	712.00	-1.42	-0.20
April	299.00	312.00	+13.10	+4.21
May	51.20	79.00	+27.90	+35.30
June	50.50	87.20	+36.70	+42.10
July	42.60	82.10	+39.50	+48.10
August	46.20	85.10	+39.00	+45.80
September	61.00	91.60	+30.60	+33.40
October	222.00	243.00	+21.40	+8.81
November	551.00	549.00	-1.42	-0.26
December	614.00	613.00	-1.42	-0.23
Annual	335.00	352.00	+16.90	+4.80

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River above Diversion Dam at Bend

Time: 12:45

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	37.30	37.20	-0.11
February	40.00	39.60	-0.47
March	42.90	42.30	-0.64
April	73.20	73.40	+0.22
May	97.00	97.50	+0.54
June	100.00	100.00	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	97.00	97.80	+0.78
October	54.60	56.20	+1.61
November	29.00	28.80	-0.22
December	35.70	35.50	-0.22
Annual	67.40	67.50	+0.13

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River above Diversion Dam at Bend

Time: 12:45

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	712.00	711.00	-1.39	-0.19
February	738.00	737.00	-1.39	-0.19
March	781.00	779.00	-1.39	-0.18
April	877.00	881.00	+4.38	+0.50
May	1180.00	1190.00	+11.20	+0.94
June	1360.00	1370.00	+15.40	+1.12
July	1440.00	1450.00	+18.30	+1.26
August	1290.00	1310.00	+17.70	+1.36
September	1090.00	1110.00	+14.20	+1.28
October	721.00	729.00	+8.56	+1.17
November	590.00	589.00	-1.39	-0.24
December	650.00	648.00	-1.39	-0.21
Annual	953.00	960.00	+6.95	+0.72

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River at Benham Falls

Time: 12:45

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	43.40	43.30	-0.11
February	54.50	54.50	0.00
March	32.50	31.40	-1.08
April	69.60	69.30	-0.22
May	78.10	78.10	0.00
June	92.60	92.60	0.00
July	96.80	96.80	0.00
August	94.50	94.60	+0.11
September	67.80	67.90	+0.11
October	54.00	54.00	0.00
November	35.90	35.70	-0.22
December	44.60	44.60	0.00
Annual	63.70	63.60	-0.12

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2012

Deschutes River at Benham Falls

Time: 12:46

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	814.00	813.00	-1.34	-0.16
February	845.00	844.00	-1.34	-0.16
March	901.00	900.00	-1.34	-0.15
April	1240.00	1240.00	-1.34	-0.11
May	1850.00	1850.00	+0.597	+0.03
June	2100.00	2100.00	+1.82	+0.09
July	2200.00	2210.00	+4.73	+0.22
August	2040.00	2040.00	+4.18	+0.20
September	1730.00	1740.00	+3.65	+0.21
October	1000.00	1010.00	+3.08	+0.31
November	685.00	684.00	-1.34	-0.19
December	752.00	750.00	-1.34	-0.18
Annual	1350.00	1350.00	+0.855	+0.06

CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2013

Little Deschutes River at mouth

Time: 12:48

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	22.90	20.80	-2.15
February	37.30	34.60	-2.72
March	27.40	27.10	-0.32
April	45.20	44.90	-0.33
May	55.90	55.80	-0.11
June	56.60	57.20	+0.67
July	85.10	87.50	+2.47
August	93.90	94.30	+0.43
September	72.00	73.30	+1.33
October	11.60	12.90	+1.29
November	14.70	14.00	-0.67
December	20.30	19.70	-0.64
Annual	45.30	45.20	-0.05

CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE

Effective Date: 9/30/2013

Little Deschutes River at mouth

Time: 12:49

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	162.00	161.00	-1.33	-0.83
February	183.00	182.00	-1.33	-0.73
March	219.00	218.00	-1.33	-0.61
April	262.00	261.00	-1.33	-0.51
May	329.00	329.00	+0.602	+0.18
June	298.00	300.00	+1.82	+0.61
July	230.00	235.00	+4.74	+2.02
August	200.00	204.00	+4.18	+2.05
September	144.00	147.00	+3.66	+2.49
October	76.70	79.80	+3.09	+3.87
November	108.00	107.00	-1.33	-1.24
December	142.00	141.00	-1.33	-0.94
Annual	196.00	197.00	+0.861	+0.44

**CHANGE IN PERCENT OF TIME INSTREAM REQUIREMENTS ARE MET
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2013

Deschutes River above Little Deschutes River

Time: 12:50

Date: 01/09/2015

Month	Base Line Percentage	Mitigated Percentage	Change in Percent
January	29.70	29.70	0.00
February	30.10	30.10	0.00
March	33.50	33.50	0.00
April	68.40	68.40	0.00
May	97.80	97.80	0.00
June	98.80	98.80	0.00
July	100.00	100.00	0.00
August	100.00	100.00	0.00
September	99.80	99.80	0.00
October	56.80	56.80	0.00
November	20.90	20.90	0.00
December	24.70	24.70	0.00
Annual	63.50	63.50	0.00

**CHANGE IN MEAN STREAM FLOW (CFS)
IN THE DESCHUTES BASIN AS A RESULT OF MITIGATED GROUNDWATER USE**

Effective Date: 9/30/2014

Deschutes River above Little Deschutes River

Time: 12:51

Date: 01/09/2015

Month	Base Line CFS	Mitigated CFS	Change in CFS	Percent Change
January	329.00	329.00	0.00	0.00
February	331.00	331.00	0.00	0.00
March	319.00	319.00	0.00	0.00
April	654.00	654.00	0.00	0.00
May	1220.00	1220.00	0.00	0.00
June	1500.00	1500.00	0.00	0.00
July	1690.00	1690.00	0.00	0.00
August	1530.00	1530.00	0.00	0.00
September	1260.00	1260.00	0.00	0.00
October	561.00	561.00	0.00	0.00
November	246.00	246.00	0.00	0.00
December	280.00	280.00	0.00	0.00
Annual	829.00	829.00	0.00	0.00