

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES

PETITION TO THE NEBRASKA DEPARTMENT OF NATURAL RESOURCES
FOR LEAVE TO FILE OR CONSIDER AN APPLICATION FOR A NEW
SURFACE WATER APPROPRIATION WITHIN A MORATORIUM OR STAY AREA
UNDER TITLE 457 N.A.C. CHAPTER 23

<p>Complete items 1 through 5 by printing in ink or typing the appropriate information and by placing an X in the appropriate box. Attach supporting documentation and a \$10 non-refundable filing fee.</p>	<p>For Department Use Only</p>
<p>1. Name and address of petitioner: Central Platte Natural Resources District 215 N. Kaufman Avenue Grand Island, NE 68803</p> <p>E-mail address: <u>RBishop@cpnrd.org</u> Telephone No. (<u>308</u>) <u>385-6282</u></p>	<p>Modification No.: <u>VAR-2144</u> Date Filed: <u>August 8, 2011</u> Time Filed: <u>3:47 PM</u> SW Appropriation No.: _____ (if applicable) Right ID No.: _____ (if applicable) Water Division: <u>1-A</u> Receipt No.: <u>A-3302</u> Amount: <u>10.00(30.00)</u></p>
<p>2. Check the situation that applies:</p> <p><input type="checkbox"/> Application Already Filed Application Number: _____</p> <p><input checked="" type="checkbox"/> Application Not Filed (Enclose copy of proposed application)</p>	
<p>3. Description of proposed project:</p> <p><u>Applicant proposes to divert excess water from the Platte River during periods of high flow. Diverted flows will be conducted into canals leased from Cozad Ditch Company to provide the beneficial use of recharge to groundwater. Recharged groundwater will then be used to passively augment the flows of the Platte River though discharge back to the river.</u></p>	
<p>4. The Proposed Project — (Check all that apply):</p> <p><input checked="" type="checkbox"/> 001.01 — Is a non-consumptive use</p> <p><input type="checkbox"/> 001.02 — Will replace (offset) any consumptive use (Attach Offset Plan)</p> <p><input checked="" type="checkbox"/> 001.03 — Is for possible unappropriated water (Attach Analysis)</p> <p><input type="checkbox"/> 001.04 — Existed before the stay or moratorium (Attach Proof)</p> <p><input type="checkbox"/> 001.05 — Addresses a public safety issue (Attach Explanation)</p> <p><input type="checkbox"/> 001.06 — Is a temporary use for public construction (<10 AF)</p>	
<p>5. Other reason why a variance should be granted:</p> <p><u>Granting the variance will allow the Applicant to provide broad benefits to local, regional and state interests. Specifically, the augmented flows will provide habitat for species as intended by the multi-state Platte River Cooperative Agreement. Augmented flows will further assist the Applicant, Tri-Basin NRD, Twin Platte NRD and the State of Nebraska in meeting their agreed water management obligations under the Platte River Recovery Implementation Plan and LB 962 to return river flows to 1997 levels.</u></p>	
<p><u>August 4, 2011</u> Date <u>[Signature]</u> Signature of Applicant (or authorized agent)</p>	

Send to the following address (along with \$10 non-refundable filing fee):

State of Nebraska
Department of Natural Resources
301 Centennial Mall South / PO Box 94676
Lincoln, Nebraska 68509-4676
(402) 471-2363

man - 08082011 - 2144 - Pdf VAR - 2144

**STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
APPLICATION FOR A PERMIT TO APPROPRIATE WATER**

Complete items 1 through 10 by printing in ink or typing the appropriate information and by placing an X in the appropriate box.

For Department Use Only

1. Name and address of owner of land under proposed project. Names must be exactly as described on the deed or document transferring ownership of property. Landowner must sign the application.

Cozad Ditch Company
PO Box 286
Cozad, Nebraska 69130

Filed in the office of the Department of
Natural Resources at _____ a.m./p.m.

on _____

E-mail address: rstear@cozadtel.net Telephone No. (308) 325-0843

Application No. _____

2. Name, address, and telephone number of applicant if different than landowner.

Central Platte Natural Resources District
215 Kaufman Avenue (lease holder)
Grand Island, Nebraska 68803

Map No. _____

Water Division _____

Receipt No. _____ Amount _____

Right ID _____

E-mail address: bishop@cpnrd.org Telephone No. (308) 385-6282

3a. A permit is sought to:

Use natural flow Use impounded water*

Permanent

3b. A permit is sought for the purpose of:

Irrigation Manufacturing Domestic

Other recharge to enhance Platte flows

Temporary** Permanent

4a. Identify the source of water (name of stream or reservoir).

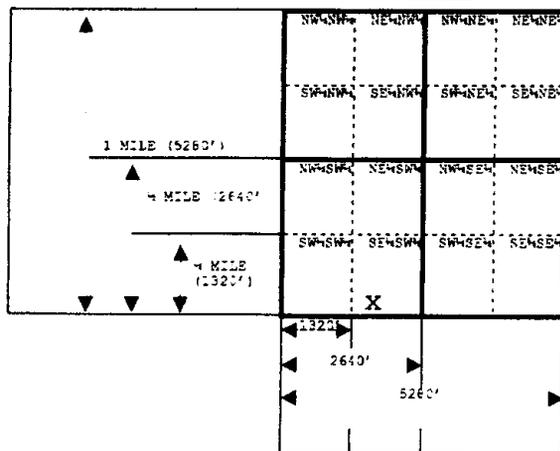
Platte River

4b. If applicable, identify the facility name for transporting water from the source (portable pump, name of canal or pipeline).

Cozad Canal

5. Identify the location of the Headgate Pump

Section 15, Township 11 North, Range 25 E W County Dawson



The box at left represents one square mile (section). Place an X within each appropriate 40-acre tract to indicate the location(s) of each headgate or pump.

If applicable, indicate the height, in feet, of any diversion or check dams on the line below.

* A separate permit to impound water must be obtained.

** A temporary permit maybe granted for a maximum of one year.

6. If applicable, identify the location of lands by 40-acre subdivisions that will be irrigated.

LEGAL SUBDIVISIONS	Sec.	Twp.	Rge.	No. of Acres	LEGAL SUBDIVISIONS	Sec.	Twp.	Rge.	No. of Acres
TOTAL NUMBER OF ACRES TO BE IRRIGATED:									0.0

Enclosed is an aerial photograph that I have marked to show the approximate location of land to be irrigated as described above.

7. State the approximate quantity of water desired for appropriation. 100

- Gallons per minute
- Cubic feet per second
- Acre-feet (impounded water)

8a. State the estimated time required for completion of all water diversion facilities.
facilities already exist

8b. State the earliest date when water will have been used for beneficial purposes.
September 15, 2011

9. Will this project be constructed under a federal program, receive federal funding, or have federal planning assistance?

No Yes If yes, explain: _____

10. I certify that am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate.

 Date Signature of owner or owner's authorized agent (with proper documentation)

A final project map may accompany this application or must be filed within six months following departmental approval of this application, drawn in accordance with NAC Title 457 – Rules for Surface Water, Chapter 10, (http://dnr.ne.gov/SurfaceWater/Title_457_0608.pdf). At the request of the applicant, the Department will assist with preparation of the project map.

This form must be completed in full. An incomplete or defective application will be returned with 90 days being allowed for resubmission. Failure to resubmit a corrected application within this period shall cause dismissal of the application and consequent loss of priority and fees.

A non-refundable filing fee, payable to the Department of Natural Resources, computed from the table below must accompany this application. Forward this application and applicable fees to:

State of Nebraska
 Department of Natural Resources
 301 Centennial Mall South / P.O. Box 94676
 Lincoln, Nebraska 68509-4676
 (402) 471-2363

Nature of Use	Cost	Nature of Use	Cost
Domestic.....	\$10	Manufacturing	
Agricultural		General.....	\$10
Irrigation from Stream		Power Generation for each theoretical 50 horsepower.....	\$5
0-1,000 acres.....	\$200	Other.....	\$10
Each additional 1,000 acre unit.....	\$100		
or portion thereof in excess of the first 1,000 acre unit			
Irrigation from Storage Reservoir			
0-1,000 acres.....	\$50		
or portion thereof in excess of the first 1,000 acre unit			
Each additional 1,000 acre unit.....	\$25		
or portion thereof in excess of the first 1,000 acre unit			

NOTE: This application is for a permanent right since LB 962 requires a permanent return to 1997 levels and a permanent return to fully appropriated).

NARRATIVE
ON
PUBLIC INTEREST BENEFIT

The water appropriation being sought is for a permanent right to provide the public interest benefits enumerated below. The flows being sought are flows considered "excess" to the flows identified in the Platte River Recovery Implementation Agreement to which the State of Nebraska is a party. A listing of the divertible flows and an explanation of where the numbers came from is attached to this application.

The water right will be used for recharge through the Cozad Canal and laterals to feed back to the Platte River in order to enhance stream flows. The operational plan will be to begin taking water as early in the spring as available and is practical in order to avoid possible ice problems and then continue, subject to availability, until irrigation season begins. If inadequate water was available prior to irrigation, diversions would continue after irrigation season concludes or demand drops off sufficient to allow the canals to have enough capacity to carry the recharge water. The total annual diversion volumes will vary depending upon flows and availability. Some years there may be little or no availability, but the requested maximum annual diversion from this application is 15,000 acre feet.

The Central Platte NRD has conducted seepage runs on both the Cozad Canal and the Thirty – mile Canal with an early indication that the amounts applied for can be recharged through the Canals and laterals without constructing any additional recharge pits or reservoirs . Attached is the results from the Cozad Canal seepage run. Please note that one station that should show a loss, actually shows a gain. (We're making water) It is probably due to inflow from runoff of Gothenburg Canal water or a drain entering the Cozad Canal in that section. Were it not for runoff entering the Canal, we would expect a loss of 15 to twenty cfs in that section, which would make the total seepage loss in excess of the 100 cfs applied for. The enhanced stream flows will help return at least two and perhaps three Natural Resources Districts back to 1997 levels of depletions in the Platte River as called for in LB 962 and as agreed to by the State of Nebraska in their agreement with Colorado, Wyoming, and the Department of Interior (PRRIP). The State of Nebraska (Department of Natural Resources) is a party to an inter-local cooperative agreement with the Basin's NRDs that calls for a 60% State, 40% NRD cost-sharing on efforts to return the basin to 1997 levels of depletion.

Enhancing flows through recharge created from "excess" flows is a much more economical way for the State and the NRDs to help get back to 1997 levels than is the retirement of irrigated acres. Retirement of irrigated acres, not only has a much larger initial cost, but also has a long-term detrimental economic impact to the communities and to the tax base for local and State governments..

The enhanced flows to the Platte River will also help Central Platte NRD and the State of Nebraska return the area between the Lincoln County line and Elm Creek, Nebraska back to fully appropriated as called for in the Basin's and Central Platte NRD's Integrated Management Plans and the State's Groundwater Management and Protection Act.

The "**Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin, Nebraska**" has, as Objective 6 of Goal 1, the requirement that each 'NRD's IMP "identify management options that will help to achieve the Goals and Objectives of the Basin Plan" and states, among other things, that "Other options that are not regulatory include, but are not limited to, **augmentation/retiming projects; alternate management of canals; etc., etc.**"

The "**Integrated Plan** Jointly developed by the Central Platte Natural Resources and the Nebraska Department of Natural Resources" specifically outlines programs that may be used to meet the needs

of Integrated Management of Water and the Platte River Recovery Program requirements to include **“(1) transfer existing surface water appropriations within the District to instream flow appropriations; (2) transfer existing surface water appropriations or apply for new appropriations for intentional recharge, and recovery when applicable, in existing canals during irrigation or non-irrigation seasons; and (3) develop new infrastructure (e.g. dams or canals) that may include intentional recharge projects, and recovery when applicable; and (4) groundwater projects for the purpose of providing net accretions to the river; and (5) contractual agreements between water users.”**

In the same section, the IMP goes on to say that the process for Implementing these other programs will include: **“Determine if unappropriated surface water is available at the necessary time, in the right location, and in the correct amount, or determine if it can be appropriately relocated or retimed.”**

To summarize, the permanent appropriation will be used for recharge to the regional ground water supplies through the Cozad Canal and laterals in order to flow back to, and enhance, the Platte River flows that will:

- Help return Central Platte NRD to 1997 levels of depletion in the Platte River, and
- Help return Twin Platte NRD to 1997 levels of depletion in the section of the river between the Tri-County Diversion and the Dawson County line (see support letter), and
- Potentially assist Tri-Basin NRD in returning to 1997 levels of depletion in the Platte River, and
- Assist the State of Nebraska (DNR) with their commitment to assist (financially and other) in returning the Platte River to 1997 levels of depletion, and
- Increase fish and wildlife habitat in the Platte River by increasing flows during times of need, and
- Allow Central Platte and the State (DNR) to meet their commitments to return the Dawson County and western Buffalo County areas to “fully” appropriated from their current “over appropriated” condition, and
- Assist with the PRRIP’s efforts to increase flows in the Platte River to assist the threatened and endangered species and their associated habitat (see support letter), and,
- Improve the flows of the Platte River as it passes the wellfields of Kearney, Grand Island, Fremont, Lincoln, Omaha and other smaller communities, and
- Reduce considerably the number of irrigated acres that would have to be retired in order to meet the flow requirements, and thereby
- Greatly lessen any detrimental impacts on the economy of the basin, it’s communities and industries whose well-being depends directly or indirectly upon irrigated agriculture, and
- Greatly lessen the detrimental impact on the local tax base that supports the cities, counties, schools, NRDs, and other local forms of government, and
- Lessens the economic impact upon the State of Nebraska by limiting the detrimental impact from lost irrigated acres on reduced sales and income tax.

The water right requested in this application not only provides the economic, environmental and social benefits outlined above, it is compatible with the Basin and the Central Platte NRD’s Integrated Management Plans.

For these reasons, and because the project, along with the other two canal project applications accompanying this application will provide a greater and broader economic, environmental and social benefit than any other use of the water, it is in the public’s interest to grant a permanent appropriation.

LEASE AND MANAGEMENT AGREEMENT

This Lease and Management Agreement is made and entered into on this ___ day of ____, 2011, between the Central Platte Natural Resources District ("CPNRD"), a political subdivision of the State of Nebraska, and the Cozad Ditch Company ("Company"), a Nebraska nonprofit corporation, collectively referred to herein as the "Parties."

RECITALS

WHEREAS, CPNRD is a political subdivision of the State of Nebraska, duly authorized to lease real and personal property and provide irrigation water within said State;

WHEREAS, CPNRD also is charged, pursuant to the Platte River Cooperative Agreement, with providing water to the Platte River for state and local purposes;

WHEREAS, Company is a Nebraska nonprofit corporation, in good standing, that owns certain real and personal property and holds certain valid, active water appropriations and rights issued by the State of Nebraska;

WHEREAS, this Agreement establishes the rights, duties, obligations and responsibilities of CPNRD and Company for the future operation, maintenance and repair of Company's water diversion works, irrigation canals, laterals and ditches and general water use;

WHEREAS, Company desires to lease to CPNRD the water appropriations as set forth on Exhibit A, attached hereto and incorporated herein by this reference; and

WHEREAS, CPNRD desires to lease a one-half (50%) interest in Company's real and personal property and water delivery systems in order to assist with continued operations to deliver surface water for irrigation and groundwater recharge as well as to provide enhanced stream flows to the Platte River for State and local purposes, including but not limited to, the Platte River Recovery Implementation Plan, the Platte River Basin-wide Integrated Management Plan, and the CPNRD Platte River Integrated Management Plan, including the return to fully appropriated for the areas in Dawson County and western Buffalo County designated as over-appropriated;

WHEREAS, Company desires to lease CPNRD the use of its irrigation canals and laterals in order for CPNRD to create ground water recharge and flow augmentation to the Platte River;

NOW, THEREFORE, in consideration of the mutual consideration, covenants and representations contained herein, the receipt and sufficiency of which both parties acknowledge, the Parties agree as follows:

1. **RECITALS.** The above recitals are true and correct and have been relied upon by the Parties hereto.

2. **LEASE.** Company hereby leases to CPNRD the water appropriations as set forth on Exhibit A.

3. **LEASE AMOUNT.** CPNRD shall pay Company the amounts set forth on Exhibit B, attached hereto and incorporated herein by this reference as payment for leasing the water appropriations set forth on Exhibit A and CPNRD's share of the operation and maintenance costs set forth in Paragraph 4 herein.

4. **OPERATION AND MAINTENANCE PAYMENTS.** Each Party to this Agreement shall be responsible for one-half (50%) of the net actual costs incurred by the Parties as necessary to allow Parties to conduct their operations as contemplated in this Agreement. It is anticipated that Company shall initially incur all such costs and CPNRD shall then reimburse company for one-half (50%) of such net costs. The methodology for calculations of such net costs shall be set forth on Exhibit B.

5. **FIRST RIGHT OF REFUSAL.** Company hereby grants to CPNRD a first right of refusal to purchase any of Company's water appropriations in the event that Company ever desires to sell such appropriations or rights, or if such appropriations or rights are sold or transferred, whether voluntarily or involuntarily, for such price and upon such terms as Company would be willing to accept for the sale or transfer of such property to a bona fide third party purchaser. In the event that Company desires to transfer such property at any time and receives a bona fide offer to purchase which Company is willing to accept, or in the event that the property is subject to any type of involuntary sale, Company shall give CPNRD written notice setting forth the terms of such offer or proposed transfer of the property. CPNRD shall have thirty (30) days from receipt of said written notice of proposed sale to exercise the right of first refusal by written acceptance of the terms of said notice delivered to Company. In the event that CPNRD exercises this right of first refusal within such thirty (30) day period, the parties shall proceed to close the sale upon the terms of the agreement. Failure to file the exercise of the first right of refusal within the thirty (30) day period shall automatically extinguish the right of first refusal for the transaction, subject to the reinstatement set forth below. If CPNRD does not exercise the right of first refusal, Company shall have a period of ninety (90) days thereafter to execute a written purchase agreement with a third party under the terms contained in the earlier written notice delivered to CPNRD. If such a purchase agreement is not executed within said time period, and if the closing of said purchase agreement is not completed within one year after the execution of the written purchase agreement, the entire right of first refusal procedure shall be reinstated.

6. **CLOSING.** Closing on this Agreement shall occur on or before December 31st, 2011 provided the following conditions precedent to Closing have been satisfied:

- a. The Parties' respective Boards of Directors have officially approved this Agreement through lawful Board action; and
- b. Company has executed all documents reasonably required by CPNRD to effectuate the lease identified in Paragraph 2 above.

7. **GOVERNING LAW.** This Agreement shall be construed under the laws of the State of Nebraska and may not be modified except in writing by both parties hereto.

8. **SUCCESSORS AND ASSIGNS.** This Agreement shall be binding on all successors and assigns of the Parties. This Agreement may be assigned only upon prior, written consent of the other Party.

9. **CONTINGENCY.** This Agreement is expressly made contingent upon Company executing a long term storage water contract with NPPD or NPPD's successor on terms acceptable to Company on or before the date of closing.

10. OPERATION OF FACILITIES AND USE OF WATER.

CPNRD shall assume lead responsibility for the following activities:

- Transfer water right uses
- Secure water rights for excess flows
- Negotiate leases with PRRIP and others
- Handle finances and bookkeeping
- Handle Payroll
- Conduct annual Audit
- Develop and submit application for Rehab Grant
- Develop Requests for Proposals - Consultants
- Develop Construction Contracts (Rehab, etc.)
- Report to Company on all matters on which CPNRD has lead responsibility.

Company shall assume lead responsibility for the following activities:

- Hire and fire employees
- Supervise employee(s) day to day
- Direct/Oversee irrigation diversions and deliveries
- Report to DNR on irrigation
- Oversee Recharge Diversions
- Report to CPNRD on all matters on which Company has lead responsibility.

CPNRD and Company shall assume joint responsibility for the following activities:

- Oversee/Handle normal O&M and approve Outside Contractor
- Determine Maintenance Needs
- Oversee Rehabilitation of Canal
- Select Contractor (for construction contracts)

11. **MANAGEMENT DECISIONS.** CPNRD and Company intend to operate jointly on all matters. In matters of management that require a vote, Company shall have a total of one (1) vote. CPNRD shall likewise have a total of one (1) vote. Unless otherwise required by law, all matters voted upon shall be deemed approved by a simple majority vote.

12. **FUTURE LIABILITY.** Company and CPNRD agree to share equally (50%-50%) any and all liability associated with future claims or actions arising out of operation of the diversion works and canals following Closing. Parties shall, at all times maintain such insurance coverage as necessary to indemnify and hold harmless the other party for any and all liability arising from claims or actions that exceed 50% of the total liability of such claim or action.

13. **MODIFICATION OF AGREEMENT.** This Agreement shall be reviewed by the Parties on an annual basis. Parties may change portions of the Agreement by a majority vote.

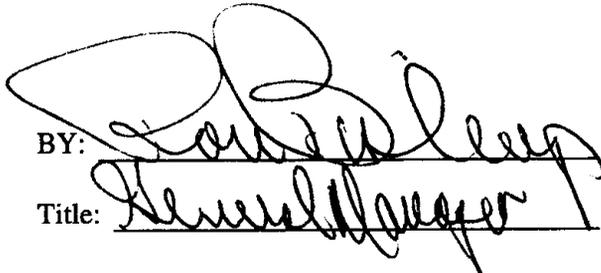
14. **REQUISITE FILINGS.** As soon as practicable following Closing, CPNRD and Company shall submit any and all necessary documentation to the Nebraska Department of Natural Resources ("DNR") regarding the lease set forth in Paragraph 2 herein.

15. **TERM OF AGREEMENT.** This Agreement shall terminate on December 31, 2042 unless terminated earlier by mutual agreement of the parties hereto.

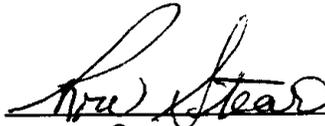
IN WITNESS WHEREOF, the Parties have executed this Agreement on this date set forth above.

Central Platte Natural Resources District,
a political subdivision of the State of
Nebraska

Cozad Ditch Company, a Nebraska
Nonprofit Corporation

BY: 

Title: General Manager

BY: 

Title: Pres

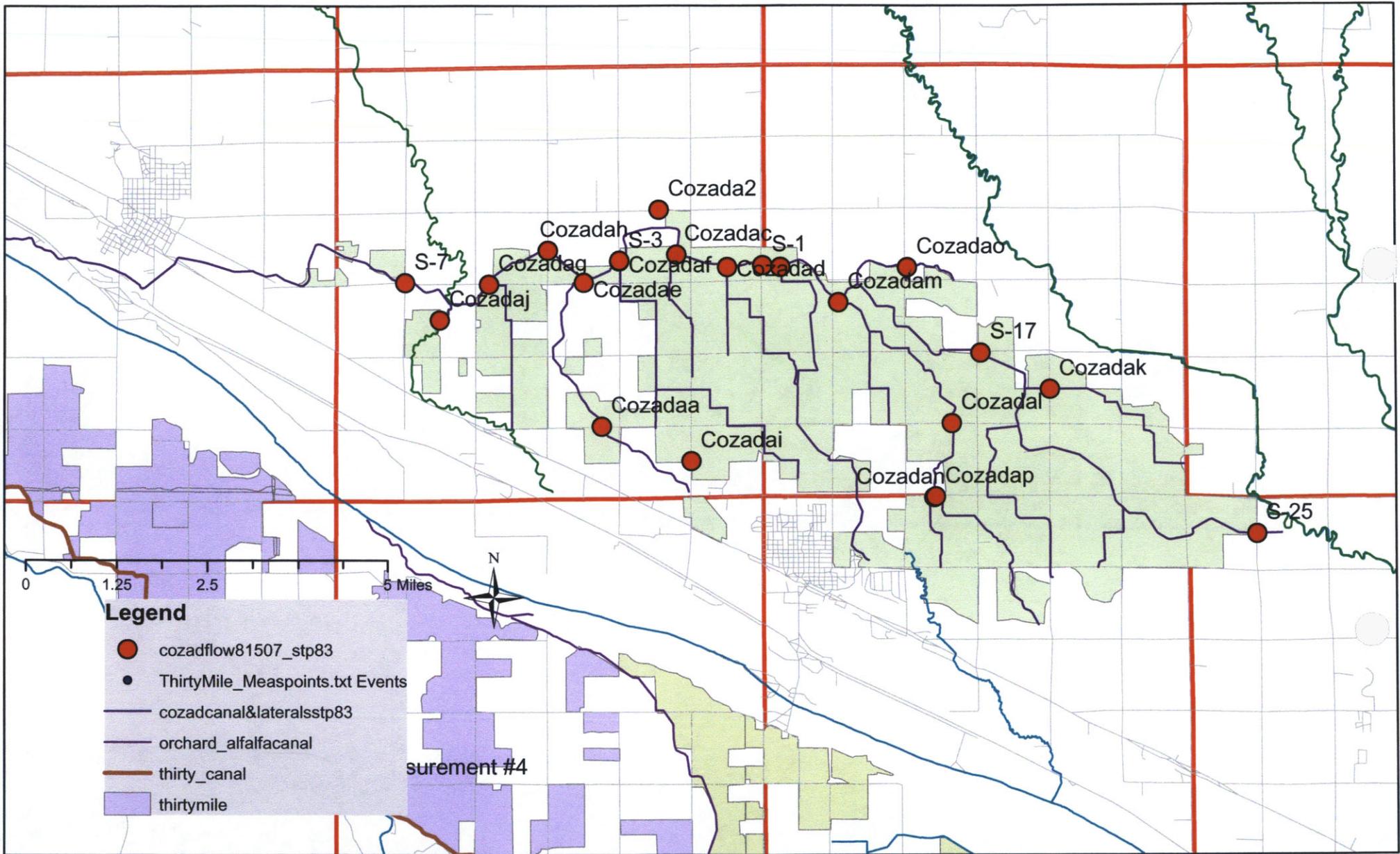
Exhibit A
To
Lease and Management Agreement

1. The equivalent of 117.22 cfs of water appropriations and rights shall be leased under this Agreement. The exact appropriation numbers and rights shall be determined by mutual agreement of the parties hereto.
2. The use of all irrigation canals and laterals *provided* such use is accomplished in a manner that does not interfere with active irrigation.

Exhibit B
To
Lease and Management Agreement

1. Lease payments to the Company for appropriation rights will be $\frac{1}{2}$ of the amount of any sublease payment received by CPNRD with regard to said appropriations rights. In the event CPNRD does not sublease the appropriation rights but elects to use them in furtherance of CPNRD's water management goals and objectives, CPNRD shall pay Company $\frac{1}{2}$ CPNRD's then standard leasing rate.
2. If CPNRD uses the irrigation canals and laterals for appropriations CPNRD may acquire after July 30, 2011, CPNRD will pay Company $\frac{1}{2}$ of any sublease payment it receives for river flow augmentation arising from the use of said canals and laterals.
3. Lease payments for appropriations and water rights shall be due on July 1st of each year of this agreement.
4. CPNRD shall reimburse Company for Operation and Maintenance Payments described in Paragraph 4 of the Agreement, calculated as follows:
 - a. Starting with all receipts of Company (except the lease payments set forth in Paragraph 1 of this Exhibit B) and specifically including all grants received by Company;
 - b. Less all expenses and maintenance costs and capital improvements incurred by Company;
 - c. Divided by two (2).
5. The payments calculated in accordance with Paragraph 3 of this Exhibit B shall be due and payable no less frequently than semi-annually.

Map of Cozad Canal seepage run measurements



FID	Shape *	LOCATION	SITE_	WIDTH	SECTIONS	AREA	VELOCITY
0	Point	S-1	1	17	32	8.47	1.06
1	Point	S-3	3	19.5	25	6.44	1.09
2	Point	S-7	7	31.5	23	1.4	0.75
3	Point	S-17	17	14	15	2.42	1.39
4	Point	S-25	25	15	16	2.49	0.63
5	Point	Cozadaa	26	4.7	17	3.265	0.956350428
6	Point	Cozadab	27	9.5	17	8.3	0.503746127
7	Point	Cozada2	2	2.5	17	1.0375	1.279986189
8	Point	Cozadac	30	3.7	17	0.87	0.497512896
9	Point	Cozadad	31	11	17	11.75	0.27939171
10	Point	Cozadae	4	7	17	7	0.778003571
11	Point	Cozadaf	32	0	17	0	#DIV/0!
12	Point	Cozadag	10	6	17	6.4	0.709501552
13	Point	Cozadah	5	0	17	0	#DIV/0!
14	Point	Cozadai	28	0	17	0	#DIV/0!
15	Point	Cozadaj	29	0	17	0	#DIV/0!
16	Point	Cozadak	18	8.5	17	8.075	1.064427245
17	Point	Cozadal	12	11	17	20.35	0.596142506
18	Point	Cozadam	12	14	17	22.65	1.296048565
19	Point	Cozadan	12	6	17	3.5	0.778
20	Point	Cozadao	16	5	17	3.4	0.252058824
21	Point	Cozadap	12	8	17	7.3	1.183150685

cozadflow81507_stp83, 8/5/2011, Page 1-2

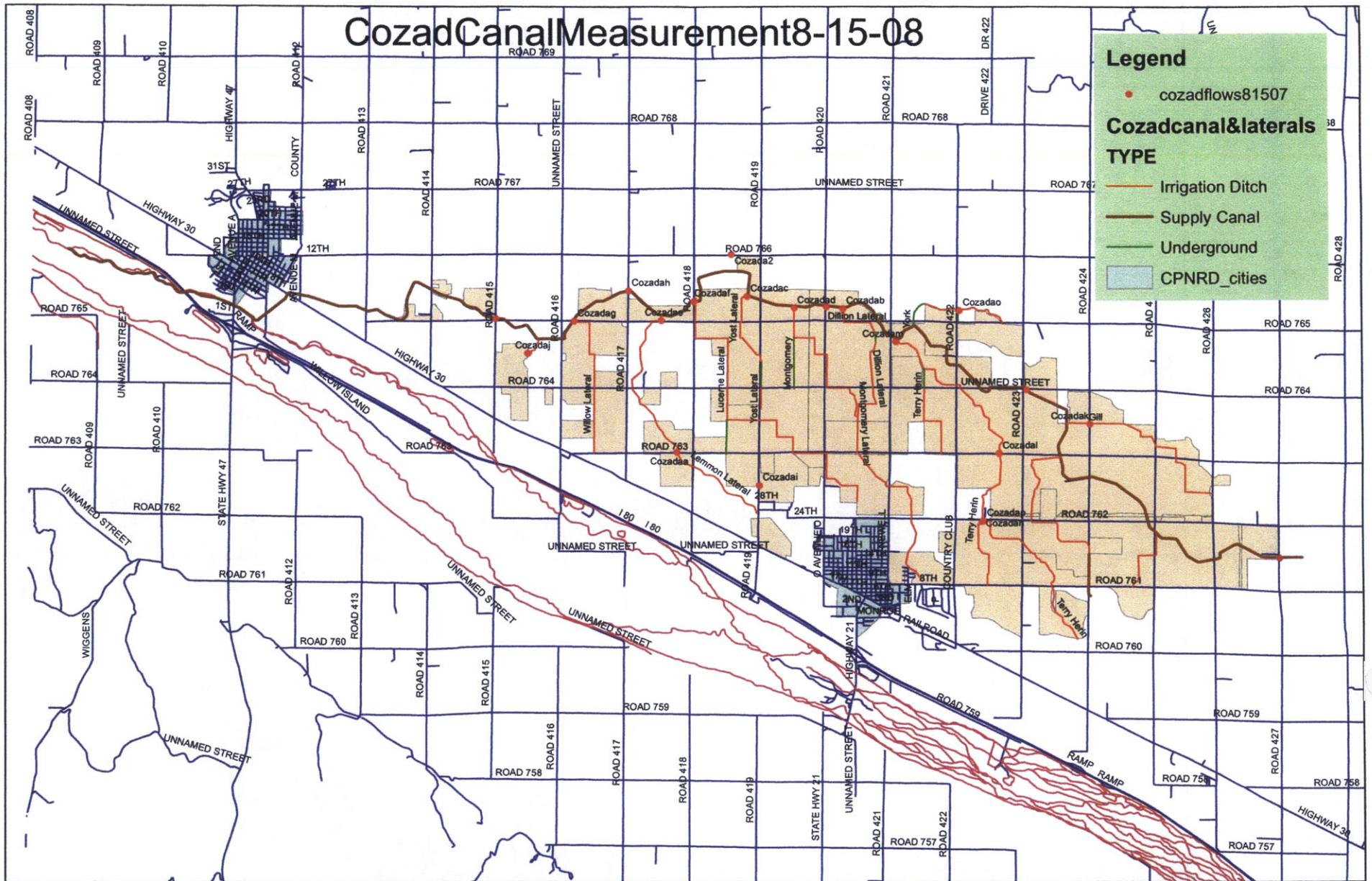
DISCHARGE	RATING	TWN	RNG	SEC	X	Y	QUARTER	ROAD
89.5	poor	11	23	18	416177	4530441	sw	420
69.9	fair	11	24	14	412969	4530565	sw	418
1.05	fair	11	24	17	408152	4530136	sw	415
33.6	good	11	23	27	421026	4528413	NW	764
16.4	good	10	22	6	427161	4524263	NE	427
3.12	good	11	24	27	412532	4526867	SE	763
6.57	good	11	23	18	416572	4530397	SW	765
1.33	good	11	24	14	413874	4531711	NE	766
0.43	good	11	24	14	414250	4530700	SE	419
3.28	good	11	24	13	415389	4530411	S	765
5.45	good	11	24	15	412171	4530095	SW	765
0	good	11	24	14	412975	4530580	SW	418
4.54	good	11	24	21	410057	4530080	NW	765
1.6	good	11	24	15	411377	4530821	SW	417
2.04	good	11	24	36	414527	4526065	NW SW	419
2.67	good	11	24	20	408928	4529293	NW	415
8.6	good	11	23	26	422560	4527574	NWSW	424
12.13	good	11	23	28	420357	4526842	SE	763
29.36	good	11	23	20	417861	4529585	NW	421
2.72	good	10	23	4	419939	4525179	NW	762
0.86	good	11	23	16	419405	4530347	SW	422
8.64	good	10	23	4	419975	4525198	NW	762

DESCRIPTIO

Main Canal
Main Canal
Main Canal
Main Canal
Lemmon Lat
Dillon Lat
Lateral 6 Gothenburg spill
Yost Lat
Montgomery Lat
Lemmon Lat
Lucerne Lat
Willow Lat

Lemmon Lat
Turnout
Gill Lat
Terry Herin Lat
Terry Herin Lat
Terry Herin Lat
York Lat
Terry Herin Lat

Cozad Canal Measurement 8-15-08



Legend

- cozadflows81507

Cozad canal & laterals

TYPE

- Irrigation Ditch
- Supply Canal
- Underground
- CPNRD_cities

Excess at Cozad

Water Available

	March	April	May	June	September	October	November	Total		
Years	Acre-feet									
1947	5,770	19,172	10,937	81,404	0	5,490	19,954	142,727		
1948	67,634	5,723	0	3,186	0	0	5,320	81,864		
1949	31,880	38,553	19,948	151,281	2,479	8,083	11,849	264,074		
1950	9,940	744	14,796	0	303	12,491	4,780	43,054		
1951	296	488	12,053	18,428	98,420	24,867	24,151	178,702		
1952	89,663	59,121	9,895	0	0	0	4,771	163,451		
1953	11,978	20,269	20,009	36	0	0	11,552	63,843		
1954	895	809	12,296	0	0	0	5,734	19,734		
1955	4,284	0	86	385	0	0	1,908	6,663		
1956	0	0	0	0	0	0	845	845		
1957	0	516	70,518	84,988	3,370	7,419	11,107	177,918		
1958	16,445	17,222	32,350	26,442	0	0	8,949	101,409		
1959	27,243	35,907	35,442	60	0	0	12,516	111,168		
1960	33,717	10,062	13,545	3,929	0	0	6,750	68,003		
1961	6,710	2,475	23,490	45,376	0	0	17,088	95,139		
1962	21,076	2,444	0	39,259	0	0	6,719	69,498		
1963	14,612	11,294	3,824	3,466	6,726	0	7,620	47,542		
1964	5,921	15,211	13,031	0	0	0	2,571	36,734		
1965	266	0	2,652	47,407	23,792	25,765	14,027	113,909		
1966	8,962	2,281	2,861	0	0	0	3,917	18,022		
1967	0	0	0	31,051	0	0	5,978	37,029		
1968	0	0	1,434	3,429	0	1,208	6,202	12,273		
1969	11,179	936	15,527	39,749	434	3,146	20,227	91,199		
1970	6,139	15,923	19,369	38,711	6	0	5,542	85,690		
1971	5,443	12,555	24,670	237,286	14	129	23,851	303,949		
1972	9,837	11,496	18,973	0	19	0	11,855	52,180		
1973	3,951	78,411	585,576	494,826	6,345	161,776	93,566	1,424,451		
1974	58,896	208,346	40,850	793	0	0	11,339	320,224		
1975	3,122	0	3,159	21,388	71	0	5,556	33,296		
1976	11,254	13,035	8,926	2	696	0	4,205	38,119		
1977	0	11,300	6,855	294	0	0	7,666	26,114		
1978	19,521	4,816	6,865	0	0	0	1,624	32,826		
1979	11,730	56	5,028	91,759	0	0	6,724	115,297		
1980	29,431	2,511	293,024	180,881	0	0	5,687	511,533		
1981	0	0	6,775	28	798	0	7,107	14,708		
1982	855	0	518	111	184	2,445	9,602	13,715		
1983	10,257	38,527	288,980	942,813	8,164	129,691	25,214	1,443,645		
1984	86,709	296,999	805,961	508,203	29,663	68,095	113,385	1,909,015		
1985	32,654	79,702	15,582	10,334	7,948	6,526	6,729	159,474		
1986	10,446	32,926	56,553	161,472	10,941	20,406	22,044	314,787		
1987	57,675	104,348	38,860	58,116	12,272	5,146	15,826	292,244		
1988	7,675	180	14,636	0	2,001	0	9,239	33,731		
1989	2,809	0	1,423	0	12,327	0	1,609	18,168		
1990	0	0	4,606	0	0	0	0	4,606		
1991	1,716	0	9,519	14,140	0	0	6,301	31,676		
1992	0	0	0	0	0	0	79	79		
1993	42,916	345	2,398	2,442	7,486	0	6,892	62,479		
1994	4,923	0	2,096	0	0	0	6,984	14,003		
Total	786,430	1,154,703	2,575,895	3,343,474	234,460	482,682	623,164	9,200,807		
Average	16,384	24,056	53,664	69,656	4,885	10,056	12,983	191,683		

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet							
1947	347	942	744	496	0	843	1,190	4,562
1948	992	545	0	298	0	0	397	2,231
1949	893	1,240	694	744	496	793	1,140	6,000
1950	744	248	694	0	198	1,537	496	3,917
1951	149	99	496	545	1,488	1,537	1,140	5,455
1952	1,190	1,388	694	0	0	0	545	3,818
1953	793	1,488	1,537	36	0	0	992	4,846
1954	149	99	1,537	0	0	0	744	2,529
1955	298	0	86	198	0	0	248	829
1956	0	0	0	0	0	0	248	248
1957	0	99	1,041	1,488	942	793	992	5,355
1958	645	694	793	942	0	0	694	3,769
1959	1,289	1,488	1,537	60	0	0	992	5,366
1960	694	397	744	397	0	0	744	2,975
1961	347	347	1,091	1,488	0	0	1,289	4,562
1962	793	149	0	893	0	0	744	2,579
1963	1,041	793	1,537	1,041	496	0	744	5,653
1964	446	1,339	1,537	0	0	0	496	3,818
1965	50	0	149	496	1,388	1,140	744	3,967
1966	793	347	694	0	0	0	645	2,479
1967	0	0	0	1,091	0	0	744	1,835
1968	0	0	248	347	0	149	744	1,488
1969	595	198	645	496	248	446	1,388	4,017
1970	595	893	744	347	6	0	645	3,229
1971	595	694	694	1,488	14	50	1,289	4,824
1972	793	595	545	0	19	0	744	2,697
1973	397	1,488	1,537	1,488	893	1,537	1,488	8,826
1974	793	1,488	942	99	0	0	744	4,066
1975	347	0	942	496	71	0	744	2,600
1976	843	1,339	1,537	2	397	0	545	4,663
1977	0	496	545	149	0	0	744	1,934
1978	595	298	942	0	0	0	248	2,083
1979	793	50	694	496	0	0	744	2,777
1980	1,091	545	1,537	1,488	0	0	645	5,306
1981	0	0	744	28	248	0	744	1,764
1982	99	0	149	50	50	298	744	1,388
1983	645	1,488	1,537	1,488	744	1,537	1,388	8,826
1984	1,537	1,488	1,537	1,488	1,289	1,240	1,488	10,066
1985	1,091	1,488	744	397	1,140	843	595	6,298
1986	744	1,190	942	1,388	1,091	1,091	1,140	7,587
1987	793	1,488	992	1,388	1,388	992	992	8,033
1988	446	149	843	0	744	0	744	2,926
1989	248	0	446	0	1,488	0	496	2,678
1990	0	0	595	0	0	0	0	595
1991	248	0	397	1,041	0	0	843	2,529
1992	0	0	0	0	0	0	79	79
1993	1,041	50	347	397	893	0	545	3,273
1994	298	0	446	0	0	0	744	1,488
Total	26,281	27,124	36,879	24,771	15,730	14,826	37,220	182,831
Average	548	565	768	516	328	309	775	3,809

Water divertable at 50 CFS

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet							
1947	694	1,884	1,488	992	0	1,686	2,380	9,124
1948	1,983	1,091	0	595	0	0	793	4,463
1949	1,785	2,479	1,388	1,488	992	1,587	2,281	12,000
1950	1,488	496	1,388	0	303	3,074	992	7,741
1951	296	198	992	1,091	2,975	3,074	2,281	10,907
1952	2,380	2,777	1,388	0	0	0	1,091	7,636
1953	1,587	2,975	3,074	36	0	0	1,983	9,656
1954	298	198	3,074	0	0	0	1,488	5,058
1955	595	0	86	385	0	0	496	1,561
1956	0	0	0	0	0	0	496	496
1957	0	198	2,083	2,975	1,884	1,587	1,983	10,711
1958	1,289	1,388	1,587	1,884	0	0	1,388	7,537
1959	2,579	2,975	3,074	60	0	0	1,983	10,672
1960	1,388	793	1,488	793	0	0	1,488	5,950
1961	694	694	2,182	2,975	0	0	2,579	9,124
1962	1,587	298	0	1,785	0	0	1,488	5,157
1963	2,083	1,587	3,074	2,083	992	0	1,488	11,306
1964	893	2,678	3,074	0	0	0	992	7,636
1965	99	0	298	992	2,777	2,281	1,488	7,934
1966	1,587	694	1,388	0	0	0	1,289	4,959
1967	0	0	0	2,182	0	0	1,488	3,669
1968	0	0	496	694	0	298	1,488	2,975
1969	1,190	397	1,289	992	434	893	2,777	7,972
1970	1,190	1,785	1,488	694	6	0	1,289	6,452
1971	1,190	1,388	1,388	2,975	14	99	2,579	9,634
1972	1,587	1,190	1,091	0	19	0	1,488	5,374
1973	793	2,975	3,074	2,975	1,785	3,074	2,975	17,653
1974	1,587	2,975	1,884	198	0	0	1,488	8,132
1975	694	0	1,884	992	71	0	1,488	5,129
1976	1,686	2,678	3,074	2	696	0	1,091	9,227
1977	0	992	1,091	294	0	0	1,488	3,864
1978	1,190	595	1,884	0	0	0	496	4,165
1979	1,587	56	1,388	992	0	0	1,488	5,510
1980	2,182	1,091	3,074	2,975	0	0	1,289	10,612
1981	0	0	1,488	28	496	0	1,488	3,500
1982	198	0	298	99	99	595	1,488	2,777
1983	1,289	2,975	3,074	2,975	1,488	3,074	2,777	17,653
1984	3,074	2,975	3,074	2,975	2,579	2,479	2,975	20,132
1985	2,182	2,975	1,488	793	2,281	1,686	1,190	12,595
1986	1,488	2,380	1,884	2,777	2,182	2,182	2,281	15,174
1987	1,587	2,975	1,983	2,777	2,777	1,983	1,983	16,066
1988	893	180	1,686	0	1,488	0	1,488	5,734
1989	496	0	893	0	2,975	0	992	5,356
1990	0	0	1,190	0	0	0	0	1,190
1991	496	0	793	2,083	0	0	1,686	5,058
1992	0	0	0	0	0	0	79	79
1993	2,083	99	694	793	1,785	0	1,091	6,545
1994	595	0	893	0	0	0	1,488	2,975
Total	52,560	54,087	73,672	49,400	31,098	29,653	74,360	364,830
Average	1,095	1,127	1,535	1,029	648	618	1,549	7,601

Water divertable at 75 CFS

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
1947	1,041	2,826	2,231	1,488	0	2,529	3,570	13,686
1948	2,975	1,636	0	893	0	0	1,190	6,694
1949	2,678	3,719	2,083	2,231	1,488	2,380	3,421	18,000
1950	2,231	744	2,083	0	303	4,612	1,488	11,460
1951	296	298	1,488	1,636	4,463	4,612	3,421	16,213
1952	3,570	4,165	2,083	0	0	0	1,636	11,455
1953	2,380	4,463	4,612	36	0	0	2,975	14,465
1954	446	298	4,612	0	0	0	2,231	7,587
1955	893	0	86	385	0	0	744	2,107
1956	0	0	0	0	0	0	744	744
1957	0	298	3,124	4,463	2,826	2,380	2,975	16,066
1958	1,934	2,083	2,380	2,826	0	0	2,083	11,306
1959	3,868	4,463	4,612	60	0	0	2,975	15,978
1960	2,083	1,190	2,231	1,190	0	0	2,231	8,926
1961	1,041	1,041	3,273	4,463	0	0	3,868	13,686
1962	2,380	446	0	2,678	0	0	2,231	7,736
1963	3,124	2,380	3,824	3,124	1,488	0	2,231	16,171
1964	1,339	4,017	4,612	0	0	0	1,488	11,455
1965	149	0	446	1,488	4,165	3,421	2,231	11,901
1966	2,380	1,041	2,083	0	0	0	1,934	7,438
1967	0	0	0	3,273	0	0	2,231	5,504
1968	0	0	744	1,041	0	446	2,231	4,463
1969	1,785	595	1,934	1,488	434	1,339	4,165	11,740
1970	1,785	2,678	2,231	1,041	6	0	1,934	9,676
1971	1,785	2,083	2,083	4,463	14	129	3,868	14,424
1972	2,380	1,785	1,636	0	19	0	2,231	8,052
1973	1,190	4,463	4,612	4,463	2,678	4,612	4,463	26,479
1974	2,380	4,463	2,826	298	0	0	2,231	12,198
1975	1,041	0	2,826	1,488	71	0	2,231	7,658
1976	2,529	4,017	4,612	2	696	0	1,636	13,491
1977	0	1,488	1,636	294	0	0	2,231	5,649
1978	1,785	893	2,826	0	0	0	744	6,248
1979	2,380	56	2,083	1,488	0	0	2,231	8,237
1980	3,273	1,636	4,612	4,463	0	0	1,934	15,918
1981	0	0	2,231	28	744	0	2,231	5,235
1982	298	0	446	111	149	893	2,231	4,128
1983	1,934	4,463	4,612	4,463	2,231	4,612	4,165	26,479
1984	4,612	4,463	4,612	4,463	3,868	3,719	4,463	30,198
1985	3,273	4,463	2,231	1,190	3,421	2,529	1,785	18,893
1986	2,231	3,570	2,826	4,165	3,273	3,273	3,421	22,760
1987	2,380	4,463	2,975	4,165	4,165	2,975	2,975	24,099
1988	1,339	180	2,529	0	2,001	0	2,231	8,281
1989	744	0	1,339	0	4,463	0	1,488	8,033
1990	0	0	1,785	0	0	0	0	1,785
1991	744	0	1,190	3,124	0	0	2,529	7,587
1992	0	0	0	0	0	0	79	79
1993	3,124	149	1,041	1,190	2,678	0	1,636	9,818
1994	893	0	1,339	0	0	0	2,231	4,463
Total	78,692	81,013	109,678	73,659	45,645	44,459	111,501	544,648
Average	1,639	1,688	2,285	1,535	951	926	2,323	11,347

Water divertable at 100 CFS

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
1947	1,388	3,769	2,975	1,983	0	3,372	4,760	18,248
1948	3,967	2,182	0	1,190	0	0	1,587	8,926
1949	3,570	4,959	2,777	2,975	1,983	3,174	4,562	24,000
1950	2,975	744	2,777	0	303	6,149	1,983	14,932
1951	296	397	1,983	2,182	5,950	6,149	4,562	21,519
1952	4,760	5,554	2,777	0	0	0	2,182	15,273
1953	3,174	5,950	6,149	36	0	0	3,967	19,275
1954	595	397	6,149	0	0	0	2,975	10,116
1955	1,190	0	86	385	0	0	992	2,652
1956	0	0	0	0	0	0	845	845
1957	0	397	4,165	5,950	3,370	3,174	3,967	21,023
1958	2,579	2,777	3,174	3,769	0	0	2,777	15,074
1959	5,157	5,950	6,149	60	0	0	3,967	21,283
1960	2,777	1,587	2,975	1,587	0	0	2,975	11,901
1961	1,388	1,388	4,364	5,950	0	0	5,157	18,248
1962	3,174	595	0	3,570	0	0	2,975	10,314
1963	4,165	3,174	3,824	3,466	1,983	0	2,975	19,587
1964	1,785	5,355	6,149	0	0	0	1,983	15,273
1965	198	0	595	1,983	5,554	4,562	2,975	15,868
1966	3,174	1,388	2,777	0	0	0	2,579	9,917
1967	0	0	0	4,364	0	0	2,975	7,339
1968	0	0	992	1,388	0	595	2,975	5,950
1969	2,380	793	2,579	1,983	434	1,785	5,554	15,509
1970	2,380	3,570	2,975	1,388	6	0	2,579	12,899
1971	2,380	2,777	2,777	5,950	14	129	5,157	19,184
1972	3,174	2,380	2,182	0	19	0	2,975	10,730
1973	1,587	5,950	6,149	5,950	3,570	6,149	5,950	35,306
1974	3,174	5,950	3,769	397	0	0	2,975	16,264
1975	1,388	0	3,159	1,983	71	0	2,975	9,577
1976	3,372	5,355	6,149	2	696	0	2,182	17,756
1977	0	1,983	2,182	294	0	0	2,975	7,434
1978	2,380	1,190	3,769	0	0	0	992	8,331
1979	3,174	56	2,777	1,983	0	0	2,975	10,965
1980	4,364	2,182	6,149	5,950	0	0	2,579	21,223
1981	0	0	2,975	28	798	0	2,975	6,777
1982	397	0	518	111	184	1,190	2,975	5,375
1983	2,579	5,950	6,149	5,950	2,975	6,149	5,554	35,306
1984	6,149	5,950	6,149	5,950	5,157	4,959	5,950	40,264
1985	4,364	5,950	2,975	1,587	4,562	3,372	2,380	25,190
1986	2,975	4,760	3,769	5,554	4,364	4,364	4,562	30,347
1987	3,174	5,950	3,967	5,554	5,554	3,967	3,967	32,132
1988	1,785	180	3,372	0	2,001	0	2,975	10,314
1989	992	0	1,423	0	5,950	0	1,609	9,974
1990	0	0	2,380	0	0	0	0	2,380
1991	992	0	1,587	4,165	0	0	3,372	10,116
1992	0	0	0	0	0	0	79	79
1993	4,165	198	1,388	1,587	3,570	0	2,182	13,091
1994	1,190	0	1,785	0	0	0	2,975	5,950
Total	104,824	107,691	143,886	97,208	59,071	59,236	148,120	720,036
Average	2,184	2,244	2,998	2,025	1,231	1,234	3,086	15,001

Water divertable at 150 CFS

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
1947	2,083	5,653	4,463	2,975	0	5,058	7,140	27,372
1948	5,950	3,273	0	1,785	0	0	2,380	13,388
1949	5,355	7,438	4,165	4,463	2,479	4,760	6,843	35,504
1950	4,463	744	4,165	0	303	9,223	2,975	21,874
1951	296	488	2,975	3,273	8,926	9,223	6,843	32,023
1952	7,140	8,331	4,165	0	0	0	3,273	22,909
1953	4,760	8,926	9,223	36	0	0	5,950	28,895
1954	893	595	9,223	0	0	0	4,463	15,174
1955	1,785	0	86	385	0	0	1,488	3,743
1956	0	0	0	0	0	0	845	845
1957	0	516	6,248	8,926	3,370	4,760	5,950	29,770
1958	3,868	4,165	4,760	5,653	0	0	4,165	22,612
1959	7,736	8,926	9,223	60	0	0	5,950	31,895
1960	4,165	2,380	4,463	2,380	0	0	4,463	17,851
1961	2,083	2,083	6,545	8,926	0	0	7,736	27,372
1962	4,760	893	0	5,355	0	0	4,463	15,471
1963	6,248	4,760	3,824	3,466	2,975	0	4,463	25,736
1964	2,678	8,033	9,223	0	0	0	2,571	22,504
1965	266	0	893	2,975	8,331	6,843	4,463	23,770
1966	4,760	2,083	2,861	0	0	0	3,868	13,572
1967	0	0	0	6,545	0	0	4,463	11,008
1968	0	0	1,434	2,083	0	893	4,463	8,872
1969	3,570	936	3,868	2,975	434	2,678	8,331	22,792
1970	3,570	5,355	4,463	2,083	6	0	3,868	19,345
1971	3,570	4,165	4,165	8,926	14	129	7,736	28,705
1972	4,760	3,570	3,273	0	19	0	4,463	16,085
1973	2,380	8,926	9,223	8,926	5,355	9,223	8,926	52,959
1974	4,760	8,926	5,653	595	0	0	4,463	24,397
1975	2,083	0	3,159	2,975	71	0	4,463	12,751
1976	5,058	8,033	8,926	2	696	0	3,273	25,988
1977	0	2,975	3,273	294	0	0	4,463	11,004
1978	3,570	1,785	5,653	0	0	0	1,488	12,496
1979	4,760	56	4,165	2,975	0	0	4,463	16,419
1980	6,545	2,511	9,223	8,926	0	0	3,868	31,073
1981	0	0	4,463	28	798	0	4,463	9,752
1982	595	0	518	111	184	1,785	4,463	7,656
1983	3,868	8,926	9,223	8,926	4,463	9,223	8,331	52,959
1984	9,223	8,926	9,223	8,926	7,736	7,438	8,926	60,397
1985	6,545	8,926	4,463	2,380	6,843	5,058	3,570	37,785
1986	4,463	7,140	5,653	8,331	6,545	6,545	6,843	45,521
1987	4,760	8,926	5,950	8,331	8,331	5,146	5,950	47,394
1988	2,678	180	5,058	0	2,001	0	4,463	14,380
1989	1,488	0	1,423	0	8,926	0	1,609	13,445
1990	0	0	3,570	0	0	0	0	3,570
1991	1,488	0	2,380	6,248	0	0	5,058	15,174
1992	0	0	0	0	0	0	79	79
1993	6,248	298	2,083	2,380	5,355	0	3,273	19,636
1994	1,785	0	2,096	0	0	0	4,463	8,344
Total	157,057	159,844	209,088	143,621	84,162	87,986	220,508	1,062,266
Average	3,272	3,330	4,356	2,992	1,753	1,833	4,594	22,131

Water divertable at 200 CFS

	March	April	May	June	Sept	October	November	Total
Years	Acre-feet							
1947	2,777	7,537	5,950	3,967	0	5,490	9,521	35,242
1948	7,934	4,364	0	2,380	0	0	3,174	17,851
1949	7,140	9,917	5,554	5,950	2,479	6,347	9,124	46,512
1950	5,950	744	5,554	0	303	12,298	3,967	28,816
1951	296	488	3,967	4,364	11,901	12,298	9,124	42,436
1952	9,521	11,107	5,554	0	0	0	4,364	30,545
1953	6,347	11,901	12,298	36	0	0	7,934	38,515
1954	895	793	12,296	0	0	0	5,734	19,718
1955	2,380	0	86	385	0	0	1,908	4,759
1956	0	0	0	0	0	0	845	845
1957	0	516	8,331	11,901	3,370	6,347	7,934	38,398
1958	5,157	5,554	6,347	7,537	0	0	5,554	30,149
1959	10,314	11,901	12,298	60	0	0	7,934	42,507
1960	5,554	3,174	5,950	3,174	0	0	5,950	23,802
1961	2,777	2,475	8,727	11,901	0	0	10,314	36,194
1962	6,347	1,190	0	7,140	0	0	5,950	20,628
1963	8,331	6,347	3,824	3,466	3,967	0	5,950	31,885
1964	3,570	10,711	12,298	0	0	0	2,571	29,149
1965	266	0	1,190	3,967	11,107	9,124	5,950	31,605
1966	6,347	2,281	2,861	0	0	0	3,917	15,407
1967	0	0	0	8,727	0	0	5,950	14,678
1968	0	0	1,434	2,777	0	1,190	5,950	11,351
1969	4,760	936	5,157	3,967	434	3,146	11,107	29,508
1970	4,760	7,140	5,950	2,777	6	0	5,157	25,791
1971	4,760	5,554	5,554	11,901	14	129	10,314	38,225
1972	6,347	4,760	4,364	0	19	0	5,950	21,441
1973	3,174	11,901	12,298	11,901	6,345	12,298	11,901	69,816
1974	6,347	11,901	7,537	793	0	0	5,950	32,529
1975	2,777	0	3,159	3,967	71	0	5,556	15,530
1976	6,744	10,711	8,926	2	696	0	4,205	31,284
1977	0	3,967	4,364	294	0	0	5,950	14,575
1978	4,760	2,380	6,865	0	0	0	1,624	15,629
1979	6,347	56	5,028	3,967	0	0	5,950	21,348
1980	8,727	2,511	12,298	11,901	0	0	5,157	40,594
1981	0	0	5,950	28	798	0	5,950	12,727
1982	793	0	518	111	184	2,380	5,950	9,937
1983	5,157	11,901	12,298	11,901	5,950	12,298	11,107	70,612
1984	12,298	11,901	12,298	11,901	10,314	9,917	11,901	80,529
1985	8,727	11,901	5,950	3,174	7,948	6,526	4,760	48,986
1986	5,950	9,521	7,537	11,107	8,727	8,727	9,124	60,694
1987	6,347	11,901	7,934	11,107	11,107	5,146	7,934	61,477
1988	3,570	180	6,744	0	2,001	0	5,950	18,446
1989	1,983	0	1,423	0	11,901	0	1,609	16,916
1990	0	0	4,606	0	0	0	0	4,606
1991	1,716	0	3,174	8,331	0	0	6,301	19,521
1992	0	0	0	0	0	0	79	79
1993	8,331	345	2,398	2,442	7,140	0	4,364	25,019
1994	2,380	0	2,096	0	0	0	5,950	10,427
Total	208,659	210,466	268,940	189,302	106,786	113,660	289,424	1,387,237
Average	4,347	4,385	5,603	3,944	2,225	2,368	6,030	28,901

Excess instream flow at Cozad														Divertable at 25 cfs						Divertable at 50 cfs			
Table contains sum of excess days in month																							
Sum of DaysExcess	Month													March	April	May	June	Sept	October	November	Total	March	April
Year	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	Grand Total	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	
1947	28.0	16.0	7.0	19.0	15.0	10.0	31.0	6.0	0.0	17.0	24.0	31.0	204.0	347	942	744	496	0	843	1,190	4,562	694	1,884
1948	28.0	18.0	20.0	11.0	0.0	6.0	6.0	3.0	0.0	0.0	8.0	26.0	126.0	992	545	0	298	0	0	397	2,231	1,983	1,091
1949	30.0	3.0	18.0	25.0	14.0	15.0	31.0	0.0	10.0	16.0	23.0	26.0	211.0	893	1,240	694	744	496	793	1,140	6,000	1,785	2,479
1950	31.0	19.0	15.0	5.0	14.0	0.0	12.0	1.0	4.0	31.0	10.0	23.0	165.0	744	248	694	0	198	1,537	496	3,917	1,488	496
1951	27.0	10.0	3.0	2.0	10.0	11.0	30.0	2.0	30.0	31.0	23.0	31.0	210.0	149	99	496	545	1,488	1,537	1,140	5,455	298	198
1952	31.0	15.0	24.0	28.0	14.0	0.0	7.0	0.0	0.0	0.0	11.0	31.0	161.0	1,190	1,388	694	0	0	0	545	3,818	2,380	2,777
1953	31.0	15.0	16.0	30.0	31.0	18.0	0.0	0.0	0.0	0.0	20.0	28.0	189.0	793	1,488	1,537	893	0	0	992	5,702	1,587	2,975
1954	31.0	20.0	3.0	2.0	31.0	0.0	0.0	4.0	0.0	0.0	15.0	27.0	133.0	149	99	1,537	0	0	0	744	2,529	298	198
1955	27.0	3.0	6.0	0.0	5.0	4.0	0.0	0.0	0.0	0.0	5.0	11.0	61.0	298	0	248	198	0	0	248	992	595	0
1956	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	15.0	45.0	0	0	0	0	0	0	248	248	0	0
1957	4.0	6.0	0.0	2.0	21.0	30.0	31.0	0.0	19.0	16.0	20.0	30.0	179.0	0	99	1,041	1,488	942	793	992	5,355	0	198
1958	31.0	0.0	13.0	14.0	16.0	19.0	22.0	0.0	0.0	0.0	14.0	20.0	149.0	645	694	793	942	0	0	694	3,769	1,289	1,388
1959	17.0	11.0	26.0	30.0	31.0	30.0	4.0	0.0	0.0	0.0	20.0	31.0	200.0	1,289	1,488	1,537	1,488	0	0	992	6,793	2,579	2,975
1960	23.0	14.0	14.0	8.0	15.0	8.0	2.0	0.0	0.0	0.0	15.0	24.0	123.0	694	397	744	397	0	0	744	2,975	1,388	793
1961	31.0	16.0	7.0	7.0	22.0	30.0	4.0	5.0	0.0	0.0	26.0	26.0	174.0	347	347	1,091	1,488	0	0	1,289	4,562	694	694
1962	28.0	15.0	16.0	3.0	0.0	18.0	22.0	9.0	0.0	0.0	15.0	18.0	144.0	793	149	0	893	0	0	744	2,579	1,587	298
1963	31.0	27.0	21.0	16.0	31.0	21.0	0.0	0.0	10.0	0.0	15.0	26.0	198.0	1,041	793	1,537	1,041	496	0	744	5,653	2,083	1,587
1964	31.0	13.0	9.0	27.0	31.0	0.0	0.0	0.0	0.0	0.0	10.0	20.0	141.0	446	1,339	1,537	0	0	0	496	3,818	893	2,678
1965	1.0	0.0	1.0	0.0	3.0	10.0	31.0	2.0	28.0	23.0	15.0	31.0	145.0	50	0	149	496	1,388	1,140	744	3,967	99	0
1966	21.0	16.0	16.0	7.0	14.0	0.0	0.0	0.0	0.0	0.0	13.0	13.0	100.0	793	347	694	0	0	0	645	2,479	1,587	694
1967	23.0	5.0	0.0	0.0	0.0	22.0	23.0	4.0	0.0	0.0	15.0	24.0	116.0	0	0	0	1,091	0	0	744	1,835	0	0
1968	23.0	9.0	0.0	0.0	5.0	7.0	3.0	6.0	0.0	3.0	15.0	12.0	83.0	0	0	248	347	0	149	744	1,488	0	0
1969	30.0	2.0	12.0	4.0	13.0	10.0	31.0	0.0	5.0	9.0	28.0	29.0	173.0	595	198	645	496	248	446	1,388	4,017	1,190	397
1970	31.0	19.0	12.0	18.0	15.0	7.0	13.0	0.0	14.0	0.0	13.0	11.0	153.0	595	893	744	347	694	0	645	3,917	1,190	1,785
1971	19.0	7.0	12.0	14.0	14.0	30.0	17.0	0.0	7.0	1.0	26.0	31.0	178.0	595	694	694	1,488	347	50	1,289	5,157	1,190	1,388
1972	15.0	27.0	16.0	12.0	11.0	0.0	0.0	12.0	1.0	0.0	15.0	17.0	126.0	793	595	545	0	50	0	744	2,727	1,587	1,190
1973	31.0	20.0	8.0	30.0	31.0	30.0	15.0	5.0	18.0	31.0	30.0	31.0	280.0	397	1,488	1,537	1,488	893	1,537	1,488	8,826	793	2,975
1974	31.0	28.0	16.0	30.0	19.0	2.0	0.0	0.0	0.0	0.0	15.0	20.0	161.0	793	1,488	942	99	0	0	744	4,066	1,587	2,975
1975	27.0	3.0	7.0	0.0	19.0	10.0	5.0	4.0	4.0	0.0	15.0	31.0	125.0	347	0	942	496	198	0	744	2,727	694	0
1976	31.0	23.0	17.0	27.0	31.0	7.0	0.0	0.0	8.0	0.0	11.0	20.0	175.0	843	1,339	1,537	347	397	0	545	5,008	1,686	2,678
1977	0.0	0.0	0.0	10.0	11.0	3.0	0.0	0.0	0.0	0.0	15.0	22.0	61.0	0	496	545	149	0	0	744	1,934	0	992
1978	0.0	0.0	12.0	6.0	19.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	42.0	595	298	942	0	0	0	248	2,083	1,190	595
1979	1.0	0.0	16.0	1.0	14.0	10.0	24.0	5.0	0.0	0.0	15.0	30.0	116.0	793	50	694	496	0	0	744	2,777	1,587	99
1980	23.0	18.0	22.0	11.0	31.0	30.0	5.0	3.0	9.0	0.0	13.0	14.0	179.0	1,091	545	1,537	1,488	446	0	645	5,752	2,182	1,091
1981	31.0	1.0	0.0	0.0	15.0	26.0	4.0	13.0	5.0	0.0	15.0	23.0	133.0	0	0	744	1,289	248	0	744	3,025	0	0
1982	6.0	0.0	2.0	0.0	3.0	1.0	0.0	0.0	1.0	6.0	15.0	31.0	65.0	99	0	149	50	50	298	744	1,388	198	0
1983	31.0	19.0	13.0	30.0	31.0	30.0	31.0	1.0	15.0	31.0	28.0	26.0	286.0	645	1,488	1,537	1,488	744	1,537	1,388	8,826	1,289	2,975
1984	31.0	29.0	31.0	30.0	31.0	30.0	18.0	0.0	26.0	25.0	30.0	31.0	312.0	1,537	1,488	1,537	1,488	1,289	1,240	1,488	10,066	3,074	2,975
1985	28.0	25.0	22.0	30.0	15.0	8.0	5.0	6.0	23.0	17.0	12.0	31.0	222.0	1,091	1,488	744	397	1,140	843	595	6,298	2,182	2,975

Excess instream flow at Cozad														Divertable at 25 cfs							Divertable at 50 cfs		
Table contains sum of excess days in month																							
Sum of DaysExcess	Month													March	April	May	June	Sept	October	November	Total	March	April
Year	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	Grand Total	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	
1986	31.0	18.0	15.0	24.0	19.0	28.0	12.0	0.0	22.0	22.0	23.0	31.0	245.0	744	1,190	942	1,388	1,091	1,091	1,140	7,587	1,488	2,380
1987	31.0	14.0	16.0	30.0	20.0	28.0	23.0	0.0	28.0	20.0	20.0	25.0	255.0	793	1,488	992	1,388	1,388	992	992	8,033	1,587	2,975
1988	31.0	27.0	9.0	3.0	17.0	0.0	13.0	8.0	15.0	0.0	15.0	28.0	166.0	446	149	843	0	744	0	744	2,926	893	298
1989	23.0	0.0	5.0	0.0	9.0	6.0	15.0	2.0	30.0	0.0	10.0	4.0	104.0	248	0	446	298	1,488	0	496	2,975	496	0
1990	31.0	1.0	0.0	0.0	12.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	45.0	0	0	595	0	0	0	0	595	0	0
1991	24.0	12.0	5.0	0.0	8.0	21.0	0.0	2.0	0.0	0.0	17.0	27.0	116.0	248	0	397	1,041	0	0	843	2,529	496	0
1992	17.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	2.0	18.0	43.0	0	0	0	0	0	0	99	99	0	0
1993	29.0	0.0	21.0	1.0	7.0	8.0	25.0	16.0	18.0	0.0	11.0	20.0	156.0	1,041	50	347	397	893	0	545	3,273	2,083	99
1994	12.0	0.0	6.0	0.0	9.0	0.0	16.0	0.0	0.0	0.0	15.0	13.0	71.0	298	0	446	0	0	0	744	1,488	595	0
Grand Total	1,148.0	544.0	530.0	547.0	747.0	584.0	537.0	120.0	350.0	299.0	751.0	1,088.0	7,245.0	26,281	27,124	37,041	28,959	17,355	14,826	37,240	188,826	52,562	54,248

						75											100				
						Divertable at 75 cfs											Divertable at 100 cfs				
May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	
Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet						
1,488	992	0	1,686	2,380	18,248	1,041	2,826	2,231	1,488	0	2,529	3,570	13,686	1,388	3,769	2,975	1,983	0	3,372	4,760	
0	595	0	0	793	8,926	2,975	1,636	0	893	0	0	1,190	6,694	3,967	2,182	0	1,190	0	0	1,587	
1,388	1,488	992	1,587	2,281	24,000	2,678	3,719	2,083	2,231	1,488	2,380	3,421	18,000	3,570	4,959	2,777	2,975	1,983	3,174	4,562	
1,388	0	397	3,074	992	15,669	2,231	744	2,083	0	595	4,612	1,488	11,752	2,975	992	2,777	0	793	6,149	1,983	
992	1,091	2,975	3,074	2,281	21,818	446	298	1,488	1,636	4,463	4,612	3,421	16,364	595	397	1,983	2,182	5,950	6,149	4,562	
1,388	0	0	0	1,091	15,273	3,570	4,165	2,083	0	0	0	1,636	11,455	4,760	5,554	2,777	0	0	0	2,182	
3,074	1,785	0	0	1,983	22,810	2,380	4,463	4,612	2,678	0	0	2,975	17,107	3,174	5,950	6,149	3,570	0	0	3,967	
3,074	0	0	0	1,488	10,116	446	298	4,612	0	0	0	2,231	7,587	595	397	6,149	0	0	0	2,975	
496	397	0	0	496	3,967	893	0	744	595	0	0	744	2,975	1,190	0	992	793	0	0	992	
0	0	0	0	496	992	0	0	0	0	0	0	744	744	0	0	0	0	0	0	992	
2,083	2,975	1,884	1,587	1,983	21,421	0	298	3,124	4,463	2,826	2,380	2,975	16,066	0	397	4,165	5,950	3,769	3,174	3,967	
1,587	1,884	0	0	1,388	15,074	1,934	2,083	2,380	2,826	0	0	2,083	11,306	2,579	2,777	3,174	3,769	0	0	2,777	
3,074	2,975	0	0	1,983	27,174	3,868	4,463	4,612	4,463	0	0	2,975	20,380	5,157	5,950	6,149	5,950	0	0	3,967	
1,488	793	0	0	1,488	11,901	2,083	1,190	2,231	1,190	0	0	2,231	8,926	2,777	1,587	2,975	1,587	0	0	2,975	
2,182	2,975	0	0	2,579	18,248	1,041	1,041	3,273	4,463	0	0	3,868	13,686	1,388	1,388	4,364	5,950	0	0	5,157	
0	1,785	0	0	1,488	10,314	2,380	446	0	2,678	0	0	2,231	7,736	3,174	595	0	3,570	0	0	2,975	
3,074	2,083	992	0	1,488	22,612	3,124	2,380	4,612	3,124	1,488	0	2,231	16,959	4,165	3,174	6,149	4,165	1,983	0	2,975	
3,074	0	0	0	992	15,273	1,339	4,017	4,612	0	0	0	1,488	11,455	1,785	5,355	6,149	0	0	0	1,983	
298	992	2,777	2,281	1,488	15,868	149	0	446	1,488	4,165	3,421	2,231	11,901	198	0	595	1,983	5,554	4,562	2,975	
1,388	0	0	0	1,289	9,917	2,380	1,041	2,083	0	0	0	1,934	7,438	3,174	1,388	2,777	0	0	0	2,579	
0	2,182	0	0	1,488	7,339	0	0	0	3,273	0	0	2,231	5,504	0	0	0	4,364	0	0	2,975	
496	694	0	298	1,488	5,950	0	0	744	1,041	0	446	2,231	4,463	0	0	992	1,388	0	595	2,975	
1,289	992	496	893	2,777	16,066	1,785	595	1,934	1,488	744	1,339	4,165	12,050	2,380	793	2,579	1,983	992	1,785	5,554	
1,488	694	1,388	0	1,289	15,669	1,785	2,678	2,231	1,041	2,083	0	1,934	11,752	2,380	3,570	2,975	1,388	2,777	0	2,579	
1,388	2,975	694	99	2,579	20,628	1,785	2,083	2,083	4,463	1,041	149	3,868	15,471	2,380	2,777	2,777	5,950	1,388	198	5,157	
1,091	0	99	0	1,488	10,909	2,380	1,785	1,636	0	149	0	2,231	8,182	3,174	2,380	2,182	0	198	0	2,975	
3,074	2,975	1,785	3,074	2,975	35,306	1,190	4,463	4,612	4,463	2,678	4,612	4,463	26,479	1,587	5,950	6,149	5,950	3,570	6,149	5,950	
1,884	198	0	0	1,488	16,264	2,380	4,463	2,826	298	0	0	2,231	12,198	3,174	5,950	3,769	397	0	0	2,975	
1,884	992	397	0	1,488	10,909	1,041	0	2,826	1,488	595	0	2,231	8,182	1,388	0	3,769	1,983	793	0	2,975	
3,074	694	793	0	1,091	20,033	2,529	4,017	4,612	1,041	1,190	0	1,636	15,025	3,372	5,355	6,149	1,388	1,587	0	2,182	
1,091	298	0	0	1,488	7,736	0	1,488	1,636	446	0	0	2,231	5,802	0	1,983	2,182	595	0	0	2,975	
1,884	0	0	0	496	8,331	1,785	893	2,826	0	0	0	744	6,248	2,380	1,190	3,769	0	0	0	992	
1,388	992	0	0	1,488	11,107	2,380	149	2,083	1,488	0	0	2,231	8,331	3,174	198	2,777	1,983	0	0	2,975	
3,074	2,975	893	0	1,289	23,008	3,273	1,636	4,612	4,463	1,339	0	1,934	17,256	4,364	2,182	6,149	5,950	1,785	0	2,579	
1,488	2,579	496	0	1,488	12,099	0	0	2,231	3,868	744	0	2,231	9,074	0	0	2,975	5,157	992	0	2,975	
298	99	99	595	1,488	5,554	298	0	446	149	149	893	2,231	4,165	397	0	595	198	198	1,190	2,975	
3,074	2,975	1,488	3,074	2,777	35,306	1,934	4,463	4,612	4,463	2,231	4,612	4,165	26,479	2,579	5,950	6,149	5,950	2,975	6,149	5,554	
3,074	2,975	2,579	2,479	2,975	40,264	4,612	4,463	4,612	4,463	3,868	3,719	4,463	30,198	6,149	5,950	6,149	5,950	5,157	4,959	5,950	
1,488	793	2,281	1,686	1,190	25,190	3,273	4,463	2,231	1,190	3,421	2,529	1,785	18,893	4,364	5,950	2,975	1,587	4,562	3,372	2,380	

						75					100										
						Divertable at 75 cfs					Divertable at 100 cfs										
May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	
Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet						
1,884	2,777	2,182	2,182	2,281	30,347	2,231	3,570	2,826	4,165	3,273	3,273	3,421	22,760	2,975	4,760	3,769	5,554	4,364	4,364	4,562	
1,983	2,777	2,777	1,983	1,983	32,132	2,380	4,463	2,975	4,165	4,165	2,975	2,975	24,099	3,174	5,950	3,967	5,554	5,554	3,967	3,967	
1,686	0	1,488	0	1,488	11,702	1,339	446	2,529	0	2,231	0	2,231	8,777	1,785	595	3,372	0	2,975	0	2,975	
893	595	2,975	0	992	11,901	744	0	1,339	893	4,463	0	1,488	8,926	992	0	1,785	1,190	5,950	0	1,983	
1,190	0	0	0	0	2,380	0	0	1,785	0	0	0	0	1,785	0	0	2,380	0	0	0	0	
793	2,083	0	0	1,686	10,116	744	0	1,190	3,124	0	0	2,529	7,587	992	0	1,587	4,165	0	0	3,372	
0	0	0	0	198	397	0	0	0	0	0	0	298	298	0	0	0	0	0	0	397	
694	793	1,785	0	1,091	13,091	3,124	149	1,041	1,190	2,678	0	1,636	9,818	4,165	198	1,388	1,587	3,570	0	2,182	
893	0	0	0	1,488	5,950	893	0	1,339	0	0	0	2,231	4,463	1,190	0	1,785	0	0	0	2,975	
74,083	57,917	34,711	29,653	74,479	755,305	78,843	81,372	111,124	86,876	52,066	44,479	111,719	566,479	105,124	108,496	148,165	115,835	69,421	59,306	148,959	

	150								200							
	Divertable at 150 cfs								Divertable at 200 cfs							
Total	March	April	May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	Total
Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
18,248	2,083	5,653	4,463	2,975	0	5,058	7,140	27,372	2,777	7,537	5,950	3,967	0	6,744	9,521	36,496
8,926	5,950	3,273	0	1,785	0	0	2,380	13,388	7,934	4,364	0	2,380	0	0	3,174	17,851
24,000	5,355	7,438	4,165	4,463	2,975	4,760	6,843	36,000	7,140	9,917	5,554	5,950	3,967	6,347	9,124	48,000
15,669	4,463	1,488	4,165	0	1,190	9,223	2,975	23,504	5,950	1,983	5,554	0	1,587	12,298	3,967	31,339
21,818	893	595	2,975	3,273	8,926	9,223	6,843	32,727	1,190	793	3,967	4,364	11,901	12,298	9,124	43,636
15,273	7,140	8,331	4,165	0	0	0	3,273	22,909	9,521	11,107	5,554	0	0	0	4,364	30,545
22,810	4,760	8,926	9,223	5,355	0	0	5,950	34,215	6,347	11,901	12,298	7,140	0	0	7,934	45,620
10,116	893	595	9,223	0	0	0	4,463	15,174	1,190	793	12,298	0	0	0	5,950	20,231
3,967	1,785	0	1,488	1,190	0	0	1,488	5,950	2,380	0	1,983	1,587	0	0	1,983	7,934
992	0	0	0	0	0	0	1,488	1,488	0	0	0	0	0	0	1,983	1,983
21,421	0	595	6,248	8,926	5,653	4,760	5,950	32,132	0	793	8,331	11,901	7,537	6,347	7,934	42,843
15,074	3,868	4,165	4,760	5,653	0	0	4,165	22,612	5,157	5,554	6,347	7,537	0	0	5,554	30,149
27,174	7,736	8,926	9,223	8,926	0	0	5,950	40,760	10,314	11,901	12,298	11,901	0	0	7,934	54,347
11,901	4,165	2,380	4,463	2,380	0	0	4,463	17,851	5,554	3,174	5,950	3,174	0	0	5,950	23,802
18,248	2,083	2,083	6,545	8,926	0	0	7,736	27,372	2,777	2,777	8,727	11,901	0	0	10,314	36,496
10,314	4,760	893	0	5,355	0	0	4,463	15,471	6,347	1,190	0	7,140	0	0	5,950	20,628
22,612	6,248	4,760	9,223	6,248	2,975	0	4,463	33,917	8,331	6,347	12,298	8,331	3,967	0	5,950	45,223
15,273	2,678	8,033	9,223	0	0	0	2,975	22,909	3,570	10,711	12,298	0	0	0	3,967	30,545
15,868	298	0	893	2,975	8,331	6,843	4,463	23,802	397	0	1,190	3,967	11,107	9,124	5,950	31,736
9,917	4,760	2,083	4,165	0	0	0	3,868	14,876	6,347	2,777	5,554	0	0	0	5,157	19,835
7,339	0	0	0	6,545	0	0	4,463	11,008	0	0	0	8,727	0	0	5,950	14,678
5,950	0	0	1,488	2,083	0	893	4,463	8,926	0	0	1,983	2,777	0	1,190	5,950	11,901
16,066	3,570	1,190	3,868	2,975	1,488	2,678	8,331	24,099	4,760	1,587	5,157	3,967	1,983	3,570	11,107	32,132
15,669	3,570	5,355	4,463	2,083	4,165	0	3,868	23,504	4,760	7,140	5,950	2,777	5,554	0	5,157	31,339
20,628	3,570	4,165	4,165	8,926	2,083	298	7,736	30,942	4,760	5,554	5,554	11,901	2,777	397	10,314	41,256
10,909	4,760	3,570	3,273	0	298	0	4,463	16,364	6,347	4,760	4,364	0	397	0	5,950	21,818
35,306	2,380	8,926	9,223	8,926	5,355	9,223	8,926	52,959	3,174	11,901	12,298	11,901	7,140	12,298	11,901	70,612
16,264	4,760	8,926	5,653	595	0	0	4,463	24,397	6,347	11,901	7,537	793	0	0	5,950	32,529
10,909	2,083	0	5,653	2,975	1,190	0	4,463	16,364	2,777	0	7,537	3,967	1,587	0	5,950	21,818
20,033	5,058	8,033	9,223	2,083	2,380	0	3,273	30,050	6,744	10,711	12,298	2,777	3,174	0	4,364	40,066
7,736	0	2,975	3,273	893	0	0	4,463	11,603	0	3,967	4,364	1,190	0	0	5,950	15,471
8,331	3,570	1,785	5,653	0	0	0	1,488	12,496	4,760	2,380	7,537	0	0	0	1,983	16,661
11,107	4,760	298	4,165	2,975	0	0	4,463	16,661	6,347	397	5,554	3,967	0	0	5,950	22,215
23,008	6,545	3,273	9,223	8,926	2,678	0	3,868	34,512	8,727	4,364	12,298	11,901	3,570	0	5,157	46,017
12,099	0	0	4,463	7,736	1,488	0	4,463	18,149	0	0	5,950	10,314	1,983	0	5,950	24,198
5,554	595	0	893	298	298	1,785	4,463	8,331	793	0	1,190	397	397	2,380	5,950	11,107
35,306	3,868	8,926	9,223	8,926	4,463	9,223	8,331	52,959	5,157	11,901	12,298	11,901	5,950	12,298	11,107	70,612
40,264	9,223	8,926	9,223	8,926	7,736	7,438	8,926	60,397	12,298	11,901	12,298	11,901	10,314	9,917	11,901	80,529
25,190	6,545	8,926	4,463	2,380	6,843	5,058	3,570	37,785	8,727	11,901	5,950	3,174	9,124	6,744	4,760	50,380

	150								200							
	Divertable at 150 cfs								Divertable at 200 cfs							
Total	March	April	May	June	Sept	October	November	Total	March	April	May	June	Sept	October	November	Total
Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
30,347	4,463	7,140	5,653	8,331	6,545	6,545	6,843	45,521	5,950	9,521	7,537	11,107	8,727	8,727	9,124	60,694
32,132	4,760	8,926	5,950	8,331	8,331	5,950	5,950	48,198	6,347	11,901	7,934	11,107	11,107	7,934	7,934	64,264
11,702	2,678	893	5,058	0	4,463	0	4,463	17,554	3,570	1,190	6,744	0	5,950	0	5,950	23,405
11,901	1,488	0	2,678	1,785	8,926	0	2,975	17,851	1,983	0	3,570	2,380	11,901	0	3,967	23,802
2,380	0	0	3,570	0	0	0	0	3,570	0	0	4,760	0	0	0	0	4,760
10,116	1,488	0	2,380	6,248	0	0	5,058	15,174	1,983	0	3,174	8,331	0	0	6,744	20,231
397	0	0	0	0	0	0	595	595	0	0	0	0	0	0	793	793
13,091	6,248	298	2,083	2,380	5,355	0	3,273	19,636	8,331	397	2,777	3,174	7,140	0	4,364	26,182
5,950	1,785	0	2,678	0	0	0	4,463	8,926	2,380	0	3,570	0	0	0	5,950	11,901
755,305	157,686	162,744	222,248	173,752	104,132	88,959	223,438	1,132,958	210,248	216,992	296,330	231,669	138,843	118,612	297,917	1,510,611

Cozad Canal Measurements 8-15-07											
Measurement Point	Flow (cfs)	Avg Flow	Lateral or Turnout	Flow (cfs)	Reach Loss (cfs)	Approx avg top width (ft)	Reach Length (ft)	Approx avg wet perim (ft)	Evaporative Loss (cfs)	Seepage Loss (cfs)	Unit Seep Loss (cfs/10,000 sq ft)
Diversion	123										
		114			18.0	31.5	40,533	40.4	0.1	17.9	0.109
S-7	105										
			Cozadaj	2.67							
			Cozadag	4.54							
		87	Cozadah	1.60	20.8	25.5	19,540	33.2	0.1	20.8	0.320
			Cozadae	5.45							
			Cozadaf	0.00							
				14.26							
S-3	69.9										
			Cozada2	1.33							
			Cozadac	0.43							
		80	Cozadad	3.28	-22.0	18.3	14,481	26.5	0.0	-22.0	-0.573
				2.39							
S-1	89.5										
			Cozadab	6.57							
			Cozadam	29.36							
		62	Cozadao	0.86	19.1	23.8	21,187	30.5	0.1	19.1	0.295
				36.78							
S-17	33.6										
		25	Cozadak	8.60	8.6	15.0	30,564	17.9	0.0	8.6	0.156
S-25	16.4										
Total					44.6					44.3 % loss in canal	0.36
Willow Lat			Cozadag	4.54		6.00	12,140	8.13	0.0		
Lemmon Lat			Cozadae	5.45		7.00	22,100	9.00	0.0		
			Cozadaa	3.12	2.32	4.70					
			Cozadai	2.04	1.08	0.00					
Lucerne Lat			Cozadaf	0.00		0.00	28,825	0.00	0.0		
Yost Lat			Cozadac	0.43		3.70	10,230	4.17	0.0		
Montgomery Lat			Cozadad	3.28		11.00	30,164	13.14	0.0		
Dillon Lat			Cozadab	6.57		9.50	12,392	11.25	0.0		
Terry Herin Lat			Cozadam	29.36		14.00	47,329	17.24	0.1		
			Cozadal	12.13	17.22	11.00					
			Cozadan	2.72		6.00					
			Cozadap	8.64	0.77	8.00					
Gill Lat			Cozadak	8.60		8.50	15,708	10.40	0.0		



TWIN PLATTE

NATURAL RESOURCES DISTRICT

August 5, 2011

Ron Bishop
General Manager
Central Platte Natural Resources District
215 N Kaufman Avenue
Grand Island, NE 68803

RE: Cozad Canal

Dear Ron

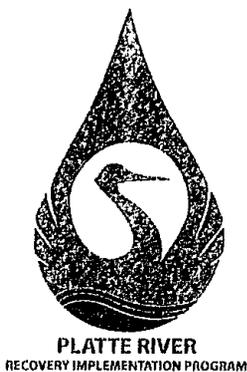
The Twin Platte Natural Resources District (TPNRD) would like to enter into a long term lease with the Central Platte Natural Resources District for 700 acre-feet of water annually from the Cozad Canal.

The TPNRD Integrated Management Plan (IMP) requires the TPNRD to implement measures within the first ten year increment to offset an average annual depletion rate of 7,700 acre-feet to the river for the period 2043-2048 for depletions due to water use initiated after July 1, 1997.

The 700 acre-feet of water annually would provide for the TPNRD 50% of the offset water required below the city of North Platte, NE.

Sincerely

Kent O. Miller, P.E.
General Manager



Office of the Executive Director
4111 4th Avenue, Suite 6
Kearney, NE 68847
Phone: (308) 237-5728
Fax: (308) 237-4651

August 4, 2011

Mr. Ron Bishop
General Manager
Central Platte Natural Resources District
215 N. Kaufman Avenue
Grand Island, NE 68803

RE: Potential water leasing arrangements between Central Platte Natural Resources District (CPNRD) and the Platte River Recovery Implementation Program (Program)

Dear Mr. Bishop:

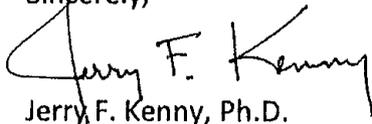
This letter is to serve as a follow-up to a series of meetings that you and I and other members of our respective staffs have had over roughly the past 12 to 15 months. The most recent of which was on July 21, 2011 in your offices.

This letter provides written confirmation that the Program is very interested in pursuing leasing arrangements with CPNRD for water currently diverted from the Platte River and used for agricultural purposes. Specific ditches that have been discussed include the Cozad, Orchard-Alfalfa, and Thirty Mile Canals. I understand that several steps must be accomplished between CPNRD and the canal companies before detailed discussions can productively occur between CPNRD and the Program. Among these steps are the following: contractual arrangements between CPNRD and some or all of these canals must be finalized, approvals of the contracts granted by your Board and theirs, and applications for water rights use transfers must be filed with the Nebraska Department of Natural Resources (NDNR). Further, that an application may be made to the NDNR for a leave to file a variance to allow diversion of excess flows available at certain times of the year at these canals for environmental purposes.

The Program continues to have a strong interest in developing a long-term leasing arrangement that would provide revenue to CPNRD and the canal companies in exchange for water delivered to the river. The water could be returned in the form of diverted water that was immediately returned to the river during the normal diversion season and/or water that was intentionally recharged through seepage from the canals and made its way back to the river as additional groundwater gain or was actively pumped into the river.

While many steps and many details are yet to be worked through, the Program remains strongly interested in working with CPNRD to reach a mutually beneficial leasing arrangement. I look forward to continuing to work with you and your staff to accomplish this.

Sincerely,



Jerry F. Kenny, Ph.D.

Executive Director

Platte River Recovery Implementation Program



Determining Divertible Flow Excess at Brady and Cozad

The excess flows for the stream gaging stations at Brady, NE and Cozad, NE were developed by the Platte River program for the 1947 thru 1994 period. This period was used by the Platte River program to determine water available for planning program projects. The OPSTUDY tool was used for determining the water accounting of projects in the Platte Basin. Recorded daily flows at Grand Island, Overton, Odessa, Cozad, Brady and North Platte were adjusted based on OPSTUDY baseline conditions.

Assumptions use in determining excess flows include

Hydrology	OPStudy Adjusted Present Condition w/Three States Projects w/out pulse
Period	1947-1994
Timestep	Daily Analysis
Excesses Calculated As	Flows in excess of the maximum of Program target flows and the Nebraska Game and Parks and central Platte NRD instream flows
Targets	Appendix A-5 "cfs" (col 4)

To determine divertible water at 25, 50, 75, 100, 150, and 200 CFS on monthly bases we counted the number of days in each month from 1947 thru 1994 that water was in excess. The number of days was then multiplied by diversion rate and converted to a volume in acre feet. If the diversion volume was greater than the excess flow volume available that month the divertible volume was limited to the excess volume.

Excess at Cozad

Water Available								
	March	April	May	June	September	October	November	Total
Years	Acre-feet							
Average	16,384	24,056	53,664	69,656	4,885	10,056	12,983	191,683
Water Divertable at 25 cfs								
Average	548	565	768	516	328	309	775	3,809
Water divertable at 50 CFS								
Average	1,095	1,127	1,535	1,029	648	618	1,549	7,601
Water divertable at 75 CFS								
Average	1,639	1,688	2,285	1,535	951	926	2,323	11,347
Water divertable at 100 CFS								
Average	2,184	2,244	2,998	2,025	1,231	1,234	3,086	15,001
Water divertable at 150 CFS								
Average	3,272	3,330	4,356	2,992	1,753	1,833	4,594	22,131
Water divertable at 200 CFS								
Average	4,347	4,385	5,603	3,944	2,225	2,368	6,030	28,901

Excess at Brady

Water Available								
	March	April	May	June	September	October	November	Total
Years	Acre-feet							
Average	13,670	22,312	51,035	66,661	3,979	9,045	11,154	177,856
Water Divertable at 25 cfs								
Average	548	565	647	472	267	309	775	3,583
Water divertable at 50 CFS								
Average	1,095	1,127	1,262	943	534	618	1,549	7,127
Water divertable at 75 CFS								
Average	1,637	1,688	1,871	1,404	776	926	2,322	10,625
Water divertable at 100 CFS								
Average	2,180	2,244	2,444	1,850	984	1,234	3,082	14,017
Water divertable at 150 CFS								
Average	3,264	3,329	3,482	2,711	1,308	1,775	4,443	20,312
Water divertable at 200 CFS								
Average	4,330	4,371	4,471	3,571	1,579	2,169	5,482	25,972



**CENTRAL PLATTE
NATURAL RESOURCES DISTRICT**
215 Kaufman Avenue
Grand Island, Nebraska 68803
(308) 385-6282 FAX (308) 385-6285
www.cpnrd.org

February 8, 2013

RECEIVED

FEB 13 2013

DEPARTMENT OF
NATURAL RESOURCES

Beth Eckles
Nebraska Department of Natural Resources
PO Box 94676
301 Centennial Mall South
Lincoln, Nebraska 68509-4676

Dear Beth:

This is in response to your inquiry regarding our water rights applications for excess Platte River flows and how we would assure that the water rights would not be used for irrigation.

The excess flows will be available and diverted for recharge predominately during the non-irrigation season, either pre-or-post. To the extent there are excess flows available to divert during the irrigation season, we will utilize recharge cells to store those diversions of excess flows and measure the inflows into the cells to account for these diversions and assure they are not being utilized for irrigation.

I hope this answers any questions you may have regarding the use of diverted excess flows from our pending water rights applications.

Sincerely,

Ron Bishop
General Manager

Cc: Mike Thompson
Jim Schneider

SW- 02132013 - (11147 - 11148 - 11149) - 205



**CENTRAL PLATTE
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March 26, 2014

Mr. Mike Thompson
Nebraska Department of Natural Resources
301 Centennial Mall South PO Box 94676
Lincoln, NE 68509-4676

Dear Mike;

This letter provides supplemental information to the Central Platte NRD's three excess flow permits Application No. A-18922, A-18923, and A-18924. The supplemental information includes an operations agreement for Platte River flow management for each canal. This agreement with DNR is an attachment to the Project Agreement that CPNRD has with DNR for funding and management of the canals. These agreements discuss how CPNRD and DNR will work together to operate the canals systems to manage Platte River flows to help improve the time USFWS Target flows and State protected flows are met. It includes an operational coordination committee that will meet annual to develop a operating plan for the next year. It includes discussion on the tracking and accounting that will be done to quantify water diverted and returned.

The first operational committee meeting was held November 12, 2013 with DNR, CPNRD, and canal company operators. The 2014 Annual Operation and Monitoring Plan was discussed, developed and is attached. It discusses guidelines for 2014 operations along with excess flow diversions in 2013. It also lists the monitoring and measurement plans for 2014.

This information along with the updated divertable excess flow information for the 1946 thru 2010 time period E-mailed to Beth in December should provide the information on the items discussed at our February 28th meeting.

In addition we wanted to let you know the canal rehab is nearing completion and the operators will be working with the Bridgeport office to get gaging equipment in place next month and divert water to test the new structures and gate equipment as irrigation season gets started. If you would like to tour the canal systems in May or June just let us know.

Thanks

Duane Woodward
Duane Woodward
Engineering Hydrologist

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Department of Natural Resources

RECEIVED
MAR 28 2014
DEPARTMENT OF
NATURAL RESOURCES

**Agreement for Operations of Thirty Mile Canal
for Platte River Flow Management**

**ATTACHMENT C TO THE
THIRTY MILE CANAL
PROJECT AGREEMENT**

DNR and CPNRD agree:

- 1) Water will be supplied to the Platte River when there are shortages to the U.S. Fish and Wildlife Service (USFWS) Target Flows, as described in the current Nebraska New Depletion Plan (NNDP) or any amended future NNDP.
- 2) Water will be supplied to the Platte River when there are shortages to state-protected flows, as may be called for under DNR water administration conditions.
- 3) Operational actions carried out by the CPNRD for this project are required to conform to all applicable constraints issued in the surface water permit.
- 4) An operational coordination committee will meet annually to discuss when and how to operate the project. This meeting could be scheduled along with the annual fall Environmental Account Committee EAC meeting. The committee will consist of a staff member from the CPNRD, the DNR Integrated Water Management division, the DNR Bridgeport Field office and an operations person from the Thirty Mile Canal Company. The CPNRD staff member will be responsible for coordinating meetings including agenda and minutes of the meeting. This committee will also develop an annual operating plan and a monitoring plan to ensure the project is accomplishing the project goals.
- 5) Operations of the project will be reported by the CPNRD to the DNR via the annual reporting requirements of the current CPNRD integrated management plan (IMP) or as amended in the future.
- 6) New depletions to the Platte River or its tributaries caused by the management operations of the Thirty Mile Canal which impact USFWS Target Flows or state-protected flows will require mitigation activities which supply accretions to the Platte River or its tributaries.
- 7) All water supplied for purposes of #1 and #2 above will count toward meeting the goals and objectives of the current CPNRD IMP or as amended in the future.
- 8) The CPNRD intends to work with Thirty Mile Canal company operation personnel to operate the canal systems so Platte River flows are enhanced each year 1,000 to 8,000 AF. Diversion of Spring and Fall excess flows will recharge the groundwater aquifer increasing base flows to the River year round. The recharge of excess flow to the aquifer and increased base flow will be measured and accounted for in the CPNRD Water Banking system. This system has been developed to track certified acres and will be updated to track canal operations (surface water diversions, returns, deliveries, seepage). The Water Banking system will include ground water flow functions to track canal seepage recharge by canal reach and track that return to the Platte River as base flow. This accounting will be done on a monthly time step using a 50 year return function.

**Agreement for Operations of Thirty Mile Canal
for Platte River Flow Management**

**ATTACHMENT C TO THE
THIRTY MILE CANAL
PROJECT AGREEMENT**

Although not related to the Rehabilitation Project, The surface water rights transferred to the Platte River will likewise be tracked in the Water Banking system. The water right transfer accounting will include 3 tracking components:

- a) The diversion of transferred surface water and its return to the Platte River near the Thirty Mile Canal diversion headgate.
- b) The diversion of transferred surface water and its return to the Platte River as baseflow. This requires computing the recharge from canal seepage and use of a ground water flow function to estimate the timing and location of the return base flow.
- c) Computing the depletion effects of ground water pumping from the transferred surface water use. This depletion accounting will be done based on location of transferred tracts of land and number of years ground water was pumped. The depletion effects will be done on a monthly time step using a 50 year return function.

The 3 tracking components will then be combined in the Water Banking system to estimate net accretions to the Platte River. Calculations for each individual component, as well as the combined net accretions will be maintained by the CPNRD and provided to NDNR according to paragraph 5 of this document.

9) Operations of the Thirty Mile Canal to improve Platte River flow during times of shortage will support the CPNRD's IMP Goal 1.A.2(a) Objective of the offsetting post-1997 annual depletion values shown in Table 1. Values in Table 1 of the CPNRD IMP are subject to change based upon new data and information.

**Agreement for Operations of Orchard-Alfalfa Canal
for
Platte River Flow Management**

**ATTACHMENT C TO THE
ORCHARD-ALFALFA CANAL
PROJECT AGREEMENT**

DNR and CPNRD agree:

- 1) Water will be supplied to the Platte River when there are shortages to the U.S. Fish and Wildlife Service (USFWS) Target Flows, as described in the current Nebraska New Depletion Plan (NNDP) or any amended future NNDP.**
- 2) Water will be supplied to the Platte River when there are shortages to state-protected flows, as may be called for under DNR water administration conditions.**
- 3) Operational actions carried out by the CPNRD for this project are required to conform to all applicable constraints issued in the surface water permit.**
- 4) An operational coordination committee will meet annually to discuss when and how to operate the project. This meeting could be scheduled along with the annual fall Environmental Account Committee EAC meeting. The committee will consist of a staff member from the CPNRD, the DNR Integrated Water Management division, the DNR Bridgeport Field office and an operations person from the Orchard-Alfalfa Canal Company. The CPNRD staff member will be responsible for coordinating meetings including agenda and minutes of the meeting. This committee will also develop an annual operating plan and a monitoring plan to ensure the project is accomplishing the project goals.**
- 5) Operations of the project will be reported by the CPNRD to the DNR via the annual reporting requirements of the current CPNRD integrated management plan (IMP) or as amended in the future.**
- 6) New depletions to the Platte River or its tributaries caused by the management operations of the Orchard-Alfalfa Canal which impact USFWS Target Flows or state-protected flows will require mitigation activities which supply accretions to the Platte River or its tributaries.**
- 7) All water supplied for purposes of #1 and #2 above will count toward meeting the goals and objectives of the current CPNRD IMP or as amended in the future.**
- 8) The CPNRD intends to work with Southside Irrigation Company operation personnel to operate the canal systems so Platte River flows are enhanced each year 1,000 to 8,000 AF. Diversion of Spring and Fall excess flows will recharge the groundwater aquifer increasing base flows to the River year round. The recharge of excess flow to the aquifer and increased base flow will be measured and accounted for in the CPNRD Water Banking system. This system has been developed to track certified acres and will be updated to track canal operations (surface water diversions, returns, deliveries, seepage). The Water Banking system will include ground water flow functions to track canal seepage recharge by canal reach and track that return to the Platte River as base flow. This accounting will be done on a monthly time step using a 50 year return function.**

**Agreement for Operations of Orchard-Alfalfa Canal
for
Platte River Flow Management**

**ATTACHMENT C TO THE
ORCHARD-ALFALFA CANAL
PROJECT AGREEMENT**

Although not related to the Rehabilitation Project, The surface water rights transferred to the Platte River will likewise be tracked in the Water Banking system. The water right transfer accounting will include 3 tracking components:

- a) The diversion of transferred surface water and its return to the Platte River near the Orchard-Alfalfa Canal diversion headgate.
- b) The diversion of transferred surface water and its return to the Platte River as baseflow. This requires computing the recharge from canal seepage and use of a ground water flow function to estimate the timing and location of the return base flow.
- c) Computing the depletion effects of ground water pumping from the transferred surface water use. This depletion accounting will be done based on location of transferred tracts of land and years ground water was pumped. The depletion effects will be done on a monthly time step using a 50 year return function.

The 3 tracking components will then be combined in the Water Banking system to estimate net accretions to the Platte River. Calculations for each individual component, as well as the combined net accretions will be maintained by the CPNRD and provided to NDNR according to paragraph 5 of this document.

9) Operations of the Orchard-Alfalfa Canal to improve Platte River flow during times of shortage will support the CPNRD's IMP Goal I.A.2(a) Objective of the offsetting post-1997 annual depletion values shown in Table 1. Values in Table 1 of the CPNRD IMP are subject to change based upon new data and information.

ATTACHMENT C - Agreement for Operations of Cozad Canal for Platte River Flow Management from the Rehabilitation Project, Related Recharge Enhancement of River Flows and the Transfer of Natural Flow Rights to Flow Enhancements

DNR and CPNRD agree:

- 1) Water will be supplied to the Platte River when there are shortages to the U.S. Fish and Wildlife Service (USFWS) Target Flows, as described in the current Nebraska New Depletion Plan (NNDP) or any amended future NNDP.**
- 2) Water will be supplied to the Platte River when there are shortages to state-protected flows, as may be called for under DNR water administration conditions.**
- 3) Operational actions carried out by the CPNRD for this project will conform to all applicable constraints issued in the surface water right permit.**
- 4) An operational coordination committee will meet annually to discuss when and how to operate the project. This meeting could be scheduled along with the annual fall Environmental Account Committee (EAC) meeting. The committee will consist of a staff member from the CPNRD, the DNR Integrated Water Management division, the DNR Bridgeport Field office and an operations person from the Cozad Canal Company. The CPNRD staff member will be responsible for coordinating meetings including agenda and minutes of the meeting. This committee will also develop an annual operating plan and a monitoring plan to ensure the project is accomplishing the project goals.**
- 5) Operations of the project will be reported by the CPNRD to the DNR via the annual reporting requirements of the current CPNRD integrated management plan (IMP) or as amended in the future.**
- 6) New depletions to the Platte River or its tributaries caused by the management operations of the Cozad Canal which impact USFWS Target Flows or state-protected flows will require mitigation activities which supply accretions to the Platte River or its tributaries.**
- 7) All water supplied for purposes of #1 and #2 above will count toward meeting the goals and objectives of the current CPNRD IMP or as amended in the future.**

Attachment C - Agreement for Operations of Cozad Canal for Platte River Flow Management from the Rehabilitation Project, Related Recharge Enhancement of River Flows and the Transfer of Natural Flow Rights to Flow Enhancements

8) The CPNRD intends to work with Cozad Canal company operation personal to operate the canal systems so Platte River flows are enhanced each year 1,000 to 8,000 AF. Diversion of Spring and Fall excess flows will recharge the groundwater aquifer increasing baseflows to the River year round. The recharge of excess flow to the aquifer and increased baseflow will be calculated and accounted for in the CPNRD Water Banking system. This system has been develop to track certified acres and will be updated to track canal operations (surface water diversions, returns, deliveries, seepage). The Water Banking system will include ground water flow functions to track canal seepage recharge by canal reach and tract that return to the Platte River as baseflow. This accounting will be done on a monthly time step over time using a 50 year return function.

Although not related to the Rehabilitation Project, the surface water rights transferred to the Platte River will likewise be tracked in the Water Banking system. The water right transfer accounting will include 3 tracking components:

- a) the diversion of transferred surface water and its return to the Platte River near the Cozad Canal diversion headgate.
- b) the diversion of transferred surface water and its return to the Platte River as baseflow. This requires computing the recharge from canal seepage and use of a ground water flow function to estimate the timing and location of the return base flow.
- c) computing the depletion effects of ground water pumping from the transferred surface water use. This depletion accounting will be done based on location of transferred tracts of land and years ground water was pumped. The depletion effects will be done on a monthly time step using a 50 year return function.

The 3 tracking components will then be combined in the Water Banking system to estimate net accretions to the Platte River. Calculations for each individual component, as well as the combined net accretions will be maintained by the CPNRD and provided to NDNR according to paragraph 5 of this document.

9) Operations of the Cozad Canal to improve Platte River flow during times of shortage will support the CPNRD's IMP Goal I.A.2(a) Objective of the offsetting post-1997 annual depletion values shown in Table 1. These estimates serve as a cap on the amount of water that may be required to be supplied as mitigations to the Platte River or its tributaries. Values in Table 1 of the CPNRD IMP are subject to change based upon new data and information; any future amended version of this table will be agreed to by the CPNRD and DNR.

2014 Annual Operations and Monitoring Plan

For Thirty Mile, Cozad, and Orchard Alfalfa Canals

The purpose of the operations plan is to provide guidelines and discuss what Canal Operations will occur during 2014. All three canals will have ongoing construction during the non irrigation season this Spring and Orchard Alfalfa this Fall so canal operations to divert excess Platte River flows may be limited. This plan discusses the canal operations for 3 time periods.

1. Spring excess flow diversion for recharge and return to the river as ground water base flows. This period of operation will generally be March 1 thru May 15th. Diversions during this time period will be made by each of the canal companies based on DNR's notice of excess flow in the Platte River. Those diversions can be made in accordance with the CPNRD water rights for each canal once they are granted. The water rights are for 100 CFS on Thirty Mile and Cozad canals and 75 CFS for Orchard Alfalfa canal.
2. Irrigation season diversion for on farm delivery and delivery back to the river for in-stream use. This period of operation will generally be May 16th thru September 15. The end of irrigation season will vary based on climate conditions and the committee will decide on irrigation season dates each year. Canal diversions will be made by the canal operators as normal to prime the canal for delivery. As increased diversions begin to make farm deliveries so will deliveries back to the River for in-stream use. The volume and rate of water delivery back to the River will be made based on the number of acres transferring water to in-stream use, the consumptive use for those acres, the natural flow rights, the natural flow available, and the daily diversions.
3. Fall excess flow diversion for recharge and return to the river as ground water base flows. This period of operation will generally be September 15th thru November 30th. Diversions during this time period will be made by each of the canal companies based on DNR's notice of excess flow in the Platte River. The water rights are for 100 CFS on Thirty Mile and Cozad canals and 75 CFS for Orchard Alfalfa canal.

Fall 2013 excess flow diversion by Thirty Mile canal. The figure below shows River flow at Grand Island, Kearney, and Overton along with USFWS target flows. The table below shows Thirty Mile canal diversions, return flow, and net quantity of water recharged. The return of the recharge water thru the groundwater as base flow will be computed using groundwater return flow functions for a 50 year period.

Monitoring or measurement plan for excess flow diversions.

1. daily canal diversions (need to determine Spring and Fall dates for stage recorder installation)
2. daily spillway return flow (exchange information on equipment and readings collected)
3. Groundwater level readings (Develop well network and reading schedule for each canal recharge area)

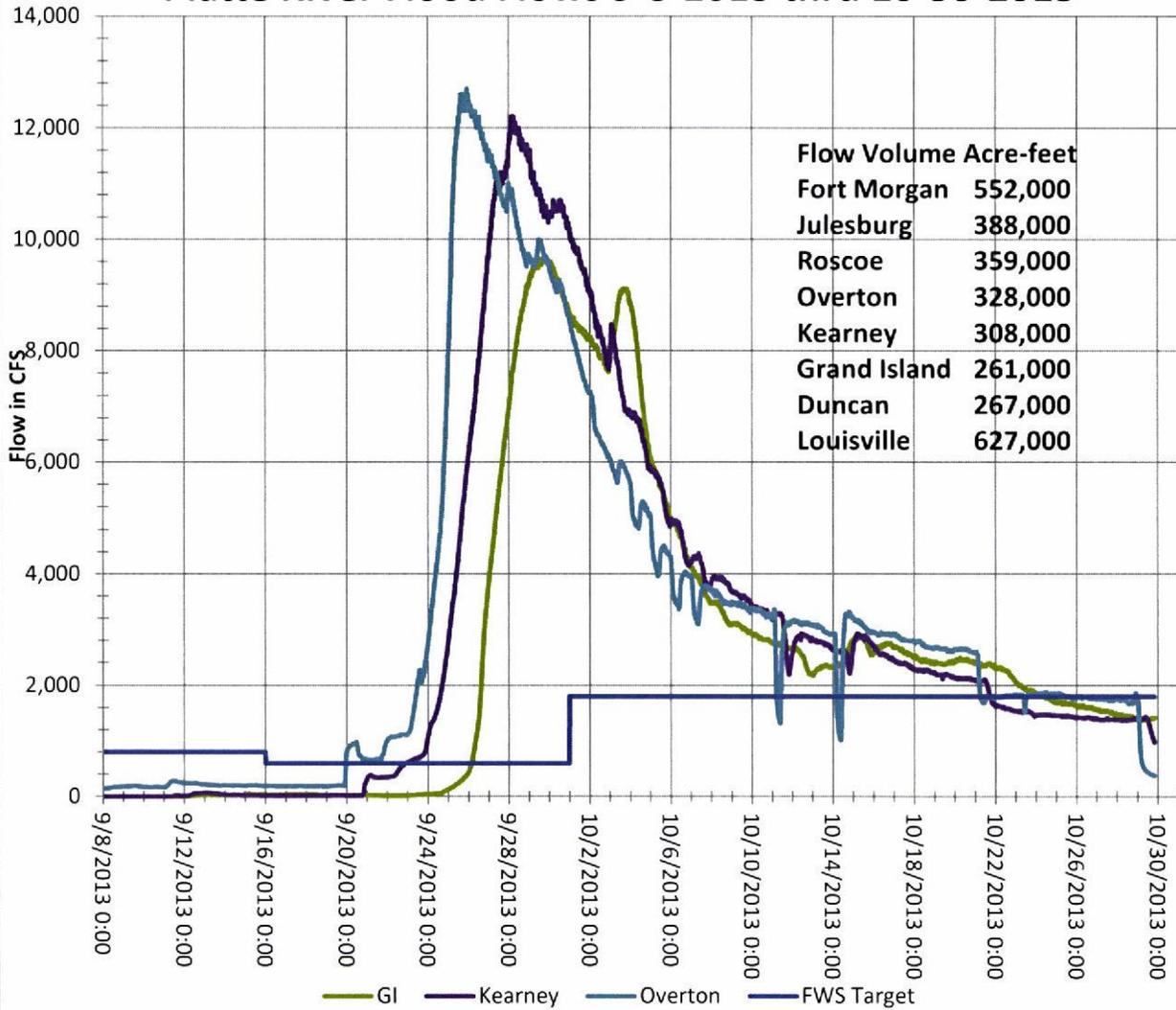
Monitoring or measurement plan for irrigation transfer to in-stream use

1. Daily canal diversion and daily river return.
2. Daily spillway return flow
3. Surface irrigated acres and groundwater irrigated acres

Other monitoring canal seepage measurements July or August.

Date	am	pm	Water diverted in AF	SPILL#1	SPILL#2	SPILL#3	RIVER	Total Spill in CFS	Total Spill in AF	Net Recharge in AF	Recharge as % of water diverted
9/21/2013	0	75	74.4	0	0	0	0	0	0.0	74.4	100%
9/22/2013	110	115	223.1	0	0	0	0	0	0.0	223.1	100%
9/23/2013	125	135	257.8	15	10	10	20	55	109.1	148.8	58%
9/24/2013	105	110	213.2	10	10	10	15	45	89.3	124.0	58%
9/25/2013	120	115	233.0	10	10	10	10	40	79.3	153.7	66%
9/26/2013	100	95	193.4	10	10	10	10	40	79.3	114.0	59%
9/27/2013	105	90	193.4	15	10	10	15	50	99.2	94.2	49%
9/28/2013	95	105	198.3	15	10	10	15	50	99.2	99.2	50%
9/29/2013	85	90	173.5	10	10	10	10	40	79.3	94.2	54%
9/30/2013	85	110	193.4	10	10	10	10	40	79.3	114.0	59%
10/1/2013	100	105	203.3	10	10	10	10	40	79.3	124.0	61%
10/2/2013	95	105	198.3	10	10	10	10	40	79.3	119.0	60%
10/3/2013	90	100	188.4	10	10	10	10	40	79.3	109.1	58%
10/4/2013	100	95	193.4	10	10	10	10	40	79.3	114.0	59%
10/5/2013	90	95	183.5	10	10	10	10	40	79.3	104.1	57%
10/6/2013	95	100	193.4	10	10	10	10	40	79.3	114.0	59%
10/7/2013	85	75	158.7	10	10	10	10	40	79.3	79.3	50%
10/8/2013	90	65	153.7	10	10	10	10	40	79.3	74.4	48%
10/9/2013	75	55	128.9	15	5	0	0	20	39.7	89.3	69%
10/10/2013	35	25	59.5	15	5	0	0	20	39.7	19.8	33%
10/11/2013	20		19.8	15	0	0	0	15	14.9	5.0	25%
			3634.6							2191.6	

Platte River Flood Flows 9-8-2013 thru 10-30-2013





**CENTRAL PLATTE
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5/14/2014

Mr. Mike Thompson
Nebraska Department of Natural Resources
301 Centennial Mall South P.O. Box 94676
Lincoln, NE 68509-4676

Dear Mike;

This letter provides supplemental information to the Central Platte NRD's three excess flow permits Application No. A-18922, A-18923, and A-18924. The information is provided in response to your 5-1-2014 E-mail discussing the need to provide the following information stated by the variance order.

If Petitioner files an application pursuant to this approval, they must propose credible methods to track, monitor and report the specific amounts of water diverted for the purpose of recharge and distinguish it from diversions for irrigation and the associated incidental underground storage.

As noted in your E-mail we are entering the new era of conjunctive water management. Conjunctive water management on the 3 canals has two management goals 1. To server the existing irrigated acres a water supply from Platte River surface water or High Plains aquifer ground water and 2. To provide improved timing of flow in the Platte River for Endangered Species that use the river. The flow permits we are requesting enable us to divert and recharge flows excess to target flows on the Platte River thus retiming the recharge water as base flow back to the Platte River. The method to track, monitor, and report specific amounts of water diverted for recharge include the following;

1. Monitor daily flows of the Platte River at Overton and Grand Island and compare them to USFWS Target flows shown in table 1 below. If the Platte River flows are greater than the target flows the target flow will be subtracted from the river flow to determine divertable excess flow.
2. If there is excess during the time periods March 1 thru June 27th or Spetember 1 thru November 30th. The canals can divert recharge water up to there water right appropriation or the capacity of the canal to recharge water. During other times of the year excess flow will not be divert for recharge because it is winter or it is during the main part of irrigation season (June 28th thru August 30th) when the canals are delivering irrigation water and being used to recharge canal seepage and on-farm losses that need to be recharged when surface water is transfered back to the river.
3. Excess flows diverted during March 1 thru June 27th or during September 1 thru November 30th will be measured at the canal diversion dam by the DNR operated gaging station daily and water spilled back to the River will be measured daily at wasteways. The difference in the two would provide the quantity of water recharged by the canal system. We could also account for the small amount of evaporation form the surface area along the canal. We would consider this the total recharge for the day.
4. The amount of water credited to excess flow recharge would be computed by subtracting from the total recharge the long term average daily canal diversion. The long term daily average canal diversion (1970 thru 2010) for the 3 canals is shown in the attached figure 1 and shown in table 1 along with the USFWS target flow.

SW-05142014-11147-11148-11149-COR

Cozad, Thirty Mile, and Orchard Alfalfa Average Canal Diversions 1970 thru 2010

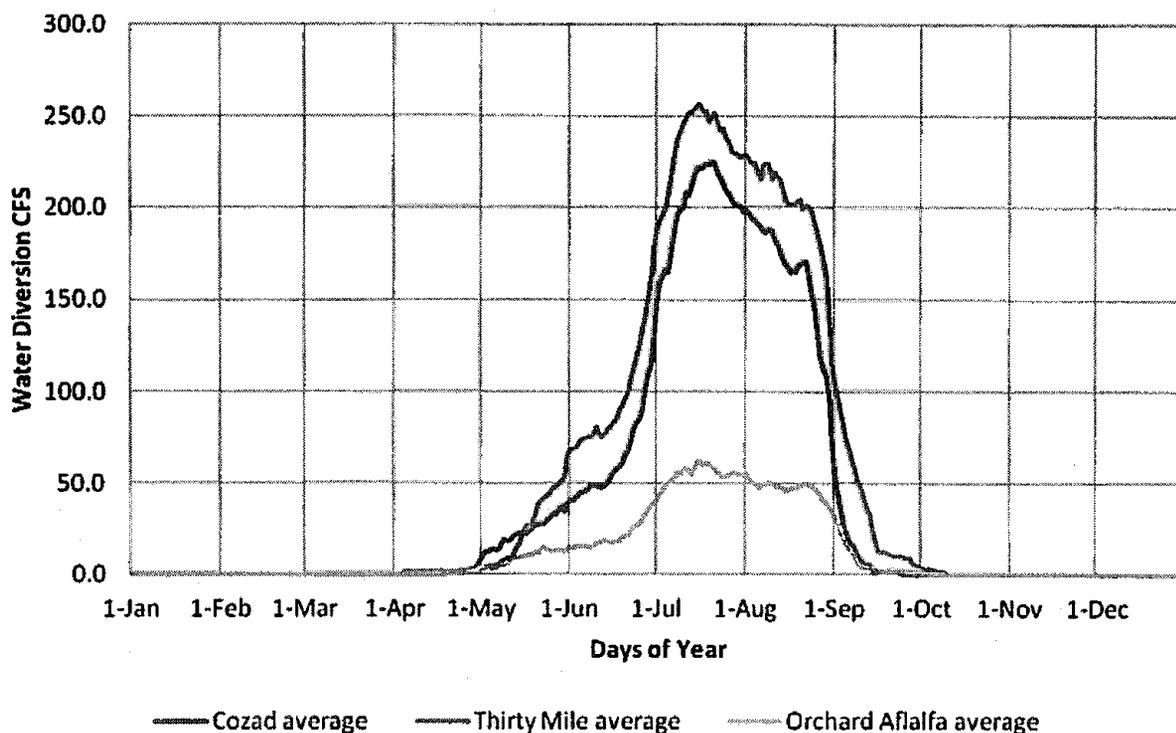


Figure 1 Average diversion by Canal.

Table 1. Determining Excess Flow Recharge for a Canals

Date	USFWS Target Flows	Excess Flow Overton & Grand Island	Ave 1970 thru 2010 Canal Diversion		
			Cozad Canal	Thirty Mile Canal	Orchard Alfalfa Canal
	CFS	CFS	CFS	CFS	CFS
1-Mar	3350		0	0	0
2-Mar	3350		0	0	0
3-Mar	3350		0	0	0
4-Mar	3350		0	0	0
5-Mar	3350		0	0	0
6-Mar	3350		0	0	0
7-Mar	3350		0	0	0
8-Mar	3350		0	0	0
9-Mar	3350		0	0	0
10-Mar	3350		0	0	0
11-Mar	3350		0	0	0
12-Mar	3350		0	0	0
13-Mar	3350		0	0	0
14-Mar	3350		0	0	0
15-Mar	3350		0	0	0
16-Mar	1800		0	0	0

17-Mar	1800	0	0	0
18-Mar	1800	0	0	0
19-Mar	1800	0	0	0
20-Mar	1800	0	0	0
21-Mar	1800	0	0	0
22-Mar	1800	0	0	0
23-Mar	2400	0	0	0
24-Mar	2400	0	0	0
25-Mar	2400	0	0	0
26-Mar	2400	0	0	0
27-Mar	2400	0	0	0
28-Mar	2400	0	0	0
29-Mar	2400	0	0	0
30-Mar	2400	0	0	0
31-Mar	2400	0	0	0
1-Apr	2400	0	0	0
2-Apr	2400	0	0	0
3-Apr	2400	0	0	0
4-Apr	2400	0	0	0
5-Apr	2400	2	0	0
6-Apr	2400	2	0	0
7-Apr	2400	2	0	0
8-Apr	2400	2	0	0
9-Apr	2400	2	0	0
10-Apr	2400	1	0	0
11-Apr	2400	1	0	0
12-Apr	2400	1	0	0
13-Apr	2400	1	0	0
14-Apr	2400	1	0	0
15-Apr	2400	1	0	0
16-Apr	2400	1	0	0
17-Apr	2400	1	0	0
18-Apr	2400	1	0	0
19-Apr	2400	1	1	0
20-Apr	2400	1	1	0
21-Apr	2400	1	1	1
22-Apr	2400	1	1	1
23-Apr	2400	2	1	1
24-Apr	2400	2	1	2
25-Apr	2400	2	1	2
26-Apr	2400	2	2	2
27-Apr	2400	3	2	2
28-Apr	2400	3	2	2
29-Apr	2400	3	2	2
30-Apr	2400	6	3	3
1-May	2400	9	4	4
2-May	2400	12	4	4
3-May	2400	13	4	4
4-May	2400	13	4	5

5-May	2400	14	4	5
6-May	2400	14	4	5
7-May	2400	14	5	6
8-May	2400	17	7	5
9-May	2400	19	8	5
10-May	2400	18	9	6
11-May	1200	19	9	8
12-May	1200	20	10	9
13-May	1200	22	14	9
14-May	1200	23	17	10
15-May	1200	23	21	10
16-May	1200	23	25	10
17-May	1200	23	27	11
18-May	1200	25	27	11
19-May	1200	26	30	11
20-May	3400	27	34	12
21-May	3400	27	39	12
22-May	3400	28	41	15
23-May	3400	28	42	15
24-May	3400	30	43	14
25-May	3400	32	45	13
26-May	3400	33	48	13
27-May	3400	33	48	13
28-May	3400	35	49	13
29-May	3400	37	51	13
30-May	3400	34	53	12
31-May	3400	39	64	14
1-Jun	3400	41	68	15
2-Jun	3400	41	69	15
3-Jun	3400	42	70	15
4-Jun	3400	44	72	15
5-Jun	3400	45	73	15
6-Jun	3400	45	74	16
7-Jun	3400	47	75	16
8-Jun	3400	48	75	15
9-Jun	3400	49	76	15
10-Jun	3400	49	81	17
11-Jun	3400	48	77	18
12-Jun	3400	48	75	18
13-Jun	3400	49	77	19
14-Jun	3400	50	79	18
15-Jun	3400	53	81	18
16-Jun	3400	55	82	17
17-Jun	3400	58	86	18
18-Jun	3400	59	90	19
19-Jun	3400	60	92	20
20-Jun	3400	65	95	21
21-Jun	1200	68	100	21
22-Jun	1200	74	108	24

23-Jun	1200	79	112	26
24-Jun	1200	83	118	27
25-Jun	1200	86	126	28
26-Jun	1200	91	134	30
27-Jun	1200	100	140	33
1-Sep	1200	56	104	32
2-Sep	1200	44	95	28
3-Sep	1200	36	88	24
4-Sep	1200	28	81	20
5-Sep	1200	23	74	17
6-Sep	1200	18	67	14
7-Sep	1200	16	62	12
8-Sep	1200	14	58	10
9-Sep	1200	11	52	7
10-Sep	1200	8	47	5
11-Sep	1200	6	42	4
12-Sep	1200	5	37	4
13-Sep	1200	5	33	4
14-Sep	1200	3	24	3
15-Sep	1200	2	19	3
16-Sep	1000	2	13	2
17-Sep	1000	2	12	1
18-Sep	1000	2	12	1
19-Sep	1000	2	12	1
20-Sep	1000	2	11	1
21-Sep	1000	2	10	1
22-Sep	1000	2	10	1
23-Sep	1000	1	10	2
24-Sep	1000	1	10	1
25-Sep	1000	0	9	1
26-Sep	1000	0	9	1
27-Sep	1000	0	9	1
28-Sep	1000	0	6	1
29-Sep	1000	0	5	1
30-Sep	1000	0	5	3
1-Oct	1800	0	4	1
2-Oct	1800	0	3	0
3-Oct	1800	0	3	0
4-Oct	1800	0	3	0
5-Oct	1800	0	3	0
6-Oct	1800	0	2	0
7-Oct	1800	0	1	0
8-Oct	1800	0	2	0
9-Oct	1800	0	1	0
10-Oct	1800	0	0	0
11-Oct	1800	0	0	0
12-Oct	1800	0	0	0
13-Oct	1800	0	0	0
14-Oct	1800	0	0	0

15-Oct	1800	0	0	0
16-Oct	1800	0	0	0
17-Oct	1800	0	0	0
18-Oct	1800	0	0	0
19-Oct	1800	0	0	0
20-Oct	1800	0	0	0
21-Oct	1800	0	0	0
22-Oct	1800	0	0	0
23-Oct	1800	0	0	0
24-Oct	1800	0	0	0
25-Oct	1800	0	0	0
26-Oct	1800	0	0	0
27-Oct	1800	0	0	0
28-Oct	1800	0	0	0
29-Oct	1800	0	0	0
30-Oct	1800	0	0	0
31-Oct	1800	0	0	0
1-Nov	1800	0	0	0
2-Nov	1800	0	0	0
3-Nov	1800	0	0	0
4-Nov	1800	0	0	0
5-Nov	1800	0	0	0
6-Nov	1800	0	0	0
7-Nov	1800	0	0	0
8-Nov	1800	0	0	0
9-Nov	1800	0	0	0
10-Nov	1800	0	0	0
11-Nov	1800	0	0	0
12-Nov	1800	0	0	0
13-Nov	1800	0	0	0
14-Nov	1800	0	0	0
15-Nov	1800	0	0	0
16-Nov	1000	0	0	0
17-Nov	1000	0	0	0
18-Nov	1000	0	0	0
19-Nov	1000	0	0	0
20-Nov	1000	0	0	0
21-Nov	1000	0	0	0
22-Nov	1000	0	0	0
23-Nov	1000	0	0	0
24-Nov	1000	0	0	0
25-Nov	1000	0	0	0
26-Nov	1000	0	0	0
27-Nov	1000	0	0	0
28-Nov	1000	0	0	0
29-Nov	1000	0	0	0
30-Nov	1000	0	0	0

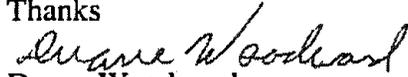
In summary we believe the operational metrics described above could be applied to the rainfall runoff example you described in the E-mail. For a rainfall runoff event during the Irrigation season April, May, June or

September and with the Platte River flow exceeding target flows diversion to the canal could be maintained at a safe rate so the canal is not clogged. The diversion minus the spill or return would provide total recharge and minus the long term average diversion would provide a number for excess flow recharge.

Applying the operational metrics as described should be conservative based on the average diversion is not being reduced for average return to the River. As we operate into the future and record spill and return-flow numbers the typical irrigation season water use will get more refined.

In formulating a plan for administering the water, determining or forecasting excess Platte River flow is a key part of the plan. Having these 3 water rights with the same date and time would be good from our prospective thus allowing flexibility in recharging water for return as base-flow in all three canal systems. From our prospective conditions on the permits could include the time period of excess flow diversion presented above.

Thanks



Duane Woodward

Engineering Hydrologist

Sum of ThirtyMile	Month												Grand Total
Year	1	2	3	4	5	6	7	8	9	10	11	12	
1945										2586	24	0	2610
1946	0	0	0	1008	4045	3600	5790	5201	2595	348	0	0	22587
1947	0	0	0	0	982	1800	1143	5880	4565	3650	693	0	18713
1948	0	0	0	0	2952	1938	2916	3544	3412	3099	0	0	17861
1949	0	0	0	0	1001	2309	4890	5965	1935	561	0	0	16661
1950	0	0	0	0	703	1864	1742	5144	2322	0	0	0	11775
1951	0	0	0	182	1046	1212	1535	5959	961	0	0	0	10895
1952	0	0	0	0	1076	4381	7898	4714	2019	1376	0	0	21464
1953	0	0	0	0	558	2604	9872	5694	4135	2474	0	0	25337
1954	0	0	0	119	1052	2197	8523	3892	2129	1164	0	0	19076
1955	0	0	0	0	1119	2745	7602	7096	0	2015	939	0	21516
1956	0	0	0	0	1166	3280	9226	3730	75	2953	0	0	20430
1957	0	0	0	0	743	1730	4952	7330	1197	0	0	0	15952
1958	0	0	0	0	0	1677	1656	6816	3014	388	0	0	13551
1959	0	0	0	0	1060	2172	6301	4285	1352	274	0	0	15444
1960	0	0	0	0	0	1672	4324	4707	899	0	0	0	11602
1961	0	0	0	0	21	1898	6231	4574	1173	71	0	0	13968
1962	0	0	0	0	1985	824	1112	5264	1098	0	0	0	10283
1963	0	0	0	0	1075	1420	6543	3839	587	0	0	0	13464
1964	0	0	0	0	582	2767	6125	4501	1464	0	0	0	15439
1965	0	0	0	0	2506	1706	3808	5575	793	0	0	0	14388
1966	0	0	0	0	0	2145	6557	4027	1478	0	0	0	14207
1967	0	0	0	346	1712	1226	3406	7024	1798	0	0	0	15512
1968	0	0	0	0	0	2006	6677	4619	1169	0	0	0	14471
1969	0	0	0	0	703	1734	5564	6312	2030	0	0	0	16343
1970	0	0	0	0	281	2544	7592	6046	1755	0	0	0	18218
1971	0	0	0	0	0	2683	7279	7709	2544	0	0	0	20215
1972	0	0	0	0	0	2980	8222	6436	3115	330	0	0	21083
1973	0	0	0	0	0	1656	7854	8222	3862	645	0	0	22239

1974	0	0	0	0	0	2848	8934	6060	2934	0	0	0	20776
1975	0	0	0	0	0	2092	7045	7472	2600	0	0	0	19209
1976	0	0	0	0	0	3078	6947	6666	2090	0	0	0	18781
1977	0	0	0	0	0	1149	8721	5590	1629	71	0	0	17160
1978	0	0	0	0	714	3526	8610	6201	2968	0	0	0	22019
1979	0	0	0	0	1985	3004	5803	5264	3084	0	0	0	19140
1980	0	0	0	0	1160	3721	9892	8330	1511	0	0	0	24614
1981	0	0	0	640	2687	3455	6038	5127	1961	0	0	0	19908
1982	0	0	0	0	1137	1997	7802	8109	2039	0	0	0	21084
1983	0	0	0	0	163	1732	6442	7261	2123	0	0	0	17721
1984	0	0	0	0	173	910	7880	8968	1444	0	0	0	19375
1985	0	0	0	0	1552	3392	8261	5722	1528	0	0	0	20455
1986	0	0	0	0	1396	3637	8775	7631	961	0	0	0	22400
1987	0	0	0	0	460	3523	8951	7379	199	0	0	0	20512
1988	0	0	0	0	658	4675	7440	6132	1081	0	0	0	19986
1989	0	0	0	0	1543	3106	8557	8429	37	0	0	0	21672
1990	0	0	0	0	864	3769	9075	6804	0	0	0	0	20512
1991	0	0	0	0	0	1963	9101	8463	60	0	0	0	19587
1992	0	0	0	0	1179	2698	7983	6383	253	0	0	0	18496
1993	0	0	0	0	689	2431	4243	4532	105	0	0	0	12000
1994	0	0	0	0	776	3490	7087	7085	61	0	0	0	18499
1995	0	0	0	0	823	2512	7560	8892	3520	0	0	0	23307
1996	0	0	0	0	802	3065	8668	6008	194	0	0	0	18737
1997	0	0	0	0	957	3367	9221	6732	73.8	0	0	0	20350.8
1998	0	0	0	0	1072.8	3743	9166	8341	18.6	0	0	0	22341.4
1999	0	0	0	0	1059.4	3059	7497	5550	304	0	0	0	17469.4
2000	0	0	0	0	1328	5808	7330	5605	0	0	0	0	20071
2001	0	0	0	0	1111	2926	7676	6690	0	0	0	0	18403
2002	0	0	0	0	1119	3334	8993	4100	0	0	0	0	17546
2003	0	0	0	0	489	2870	4621	4626	0	0	0	0	12606
2004	0	0	0	0	1771	1431	3984	3908	0	0	0	0	11094
2005	0	0	0	0	790	2492	5540	4564	0	0	0	0	13386
2006	0	0	0	0	1335.3	3017.6	5913	4162.4	0	0	0	0	14428.3

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2007	0	0	0	0	0	1706	4055	4697	0	0	0	0	10458
2008	0	0	0	0	0	1528	3716	4394	606	0	0	0	10244
2009	0	0	0	0	204	2325	4597	4365	746	0	0	0	12237
2010	0	0	0	0	0	1742.6	4217	4756	43	0	0	0	10758.6
Grand Total	0	0	0	2295	56365.5	165892.2	421681	385103.4	87649.4	22005	1656	0	1142647.5