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Hydraulics

Hydrology

Water Resources

April 30, 2003

RECEIVED
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Department of Water Resources
Southern Region

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Mr. Chris Meyer
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P.O. Box 2720
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Subject: Mitigation Plan for Bussman Dairy Transfer #68993

Dear Gentlemen:

Enclosed is a revised mitigation plan for the Bussman Dairy Transfer #68993. The application for transfer was prepared utilizing the allowable consumptive use at the time of the transfer of 3.0 acre feet per acre which would have allowed 60 af/a. Subsequent to that time, the historical consumptive use has been determined by the Department on the Larsen farm to be 2.69 af/a. With the dry up of 20 acres, the new allowed transferable consumptive use would be 53.8 af/a.

The applicant has chosen to reduce pumping on a time-graduated plan and to purchase and dry up other acres to eliminate the hydrologic impacts on the springs entering the Snake River in the Milner-King Hill reach. The specific acres for mitigation are included in the place of use for water right 37-7331 in the name of Bonnie B. and R.K. Beckley. The specific 20 acres to be purchased and dried up are in T6S 18E Section 13 NW1/4 SE1/4.

The hydrologic analysis was performed with the *Ground Water Rights Transfer Spreadsheet*. For the analysis, it was assumed that water from 205 irrigated acres would be dried up under the transfer to achieve an annual pumped transferable volume of 53.8 acre feet per year and 20 acres of Beckley land would be dried up for mitigation to allow pumping of up to 60 acre feet per year at the dairy. Both the annual pumped volume at the dairy and the number of acres dried up will be adjusted by year to achieve the required mitigation in the Milner-King Hill reach of the Snake River. The

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T68993

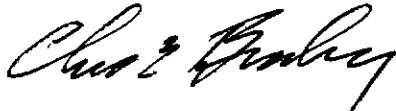
annual volume pumped would begin in 2003 at a reduced rate and increase according to the attached mitigation plan.

This analysis shows that the net effect on the Milner-King Hill springs can be mitigated by a reduced pumping schedule and additional mitigation acres with modifications yearly for the first five years and then every 5 years for the first or longer periods thereafter. This is shown on the attached mitigation plan.

I have also attached the Stipulations Regarding Mitigation with acreage dry-up schedule and graph of the achieved net depletion.

If you have any questions concerning this Mitigation plan, please don't hesitate to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Charles E. Brockway". The signature is fluid and cursive, with the first name "Charles" and last name "Brockway" clearly distinguishable.

Charles E. Brockway, P.E., Ph.D.

Enclosure: Mitigation Plan & Analysis
Stipulations Regarding Mitigation
Water Right Agreement (Idaho Water Co. & Bussman Dairy)

T68993

Mitigation Plan and Analysis

Transfer Number 68993

Applicant: John Busman, Busman Dairy

Prepared for the Applicant
by Charles E. Brockway
Brockway Engineering, P.L.L.C.

April 29, 2003

Description of transfer

This application for a water right transfer proposes to transfer 0.228 cfs and 60 acre feet per annum, of ground water right(s) currently utilized for irrigation in Section(s) 19 and 30, T8S R22E in Minidoka County to the Busman dairy in Section 7, T8S R16E in Jerome County. The Applicant is requesting the Department to transfer the entire quantity of water, but subject to the ongoing mitigation requirements outlined below as well as any other conditions imposed.

Director's Transfer Guidance

This transfer application has been prepared in accordance with the new Guidance Memorandum prepared by the Department. This guidance memorandum specifies additional requirements for documentation with respect to proof of beneficial use and non-forfeiture. All documentation required under this memoranda has been submitted to the Department.

The Administrator's Memorandum now requires a determination of historical consumptive use on irrigated land for all transfers contemplating a change in nature of use, for example, irrigation to commercial/stockwater for dairies. A determination has been made by IDWR of the historical consumptive use on the irrigated lands under water rights 36-07044, 36-02676, and 36-07158 applicable to this transfer. Based on the evaluation by Allen Merritt of the Southern Regional Office of IDWR, using FSA crop records and published consumptive use by Allen and Brockway (1983), the consumptive use on the 372 irrigated acres covered under these water rights is 2.69 af/yr. The allowable transfer volume for dairy use is equal to the average historical

consumptive use for irrigation times the number of acres proposed to be dried up under the transfer. Therefore, for this transfer, the allowed transfer volume for the 20 acres proposed to be dried up is 53.8 af/yr.

The Applicant also acknowledges that the approval of the transfer will be conditioned in accordance with various requirements spelled out in that guidance.

Impacts on Snake River and springs

The location of current water use ("FROM well") and proposed water use ("TO well") are both within the Eastern Snake Plain aquifer area. (The TO well is actually more than one well in this instance, but is referred to in this analysis as the TO well for purposes of simplicity.)

Pumping at either site will impact the discharge of springs, tributaries and underground sources reaching the various reaches of the Snake River. When a point of diversion is moved within the aquifer, impacts on each of the reaches will differ, potentially affecting other water uses.

Consequently, the applicant has undertaken a hydrologic analysis comparing the pre-transfer and post-transfer impacts of the diversion. This analysis was a dynamic one, taking into account the time delay of changes in pumping on the various reaches. The purpose of the analysis is to help craft a mitigation plan which will avoid adverse impacts on other water uses.

The analysis was performed by C.E. Brockway P.E., Brockway Engineering P.L.L.C. Brockway Engineering utilized the Groundwater Rights Transfer Spreadsheet for impacts within the Eastern Snake Plain aquifer prepared by the University of Idaho using the ESRPA Ground Water Flow Model. This spreadsheet and associated response functions simulates the effect of the proposed transfer on each of the four (4) reaches of the Snake River: Ashton to Lewisville, Near Shelley to Neeley, Neeley to Minidoka, and Milner to King Hill.

In this case, Transfer spreadsheet predicts negative impacts (that is, an increase in depletion effect compared to pre-application conditions) on the Milner to King Hill reach. Each of the remaining three reaches would experience a positive effect (that is, an reduction in depletion effect compared to pre-transfer conditions). This is consistent with the basic premise of the model, which assumes that a negative effect in any given river reach will be offset by an equal and opposite effect in one or more of the remaining reaches.

Given these results, this mitigation plan addresses only the negative impacts in the Milner-King Hill reach. No mitigation is required for any of the remaining reaches.

The spreadsheet predicts the transient impacts (that is, impacts over time) on selected reaches corresponding to pumping or recharge within specific nodes or cells within the ground water model area.

The cells corresponding to the TO well and the FROM well are selected and the volume pumped historically at the FROM well is determined from the appropriate allowed volumes from the water rights applicable to the acres to be dried up accounting for any CRP or Water Bank rental that may have occurred from these rights. The proposed future pumping volume at the TO well is entered.

The spreadsheet currently has a 150 year calculating period. It estimates impacts based on trimester (4 month) input in acre feet for the 150 year period (or 450 trimesters). The period begins on the date pumping of the first pre-transfer well was initiated. This is a sufficient time horizon for this proposed transfer.

Historic or proposed future pumping for four (4) individual wells including the TO well can be input into the spreadsheet thereby allowing the simulation of impacts from one or more individual transfer proposals and/or drying up of additional acres for mitigation of impacts. This procedure was utilized to simulate the additional positive impact of drying up additional acres at the Beckley farm to mitigate for the proposed transfer from the Larsen farm to the Busman dairy.

The allowed transfer volume per acre and the allowed volume for mitigation per acre were based on the historical consumptive use at each site. The consumptive irrigation requirement at the Larsen farm was determined by Allen Merritt of the Southern Region IDWR and the consumptive use on the Beckley farm was determined from cropping history which showed that alfalfa has been grown several years in the past on the acres proposed for mitigation. The Allen and Brockway (1983) consumptive use for alfalfa was therefore utilized to determine the allowable transfer volume for the dried up acres on the Beckley farm.

Summary of Methodology

1. For this transfer, the single cells in the ESRPA model representing the FROM point of diversion (Larsen farm, cell 9,22) and the TO point of

diversion (Busman dairy, cell 10,13) were determined. The cell location for the mitigation acres (Beckley farm , cell 14,16)

2. Historical pumping volumes for the FROM well water rights were determined based on the priorities of each rights (see Data Entry sheet attached). These rights ceased pumping after 1999. The 'Without transfer' scenario assumed that the full transferred volume continued to be pumped for the period of the simulation and the 'with transfer' scenario assumed that the historically pumped transfer volume began in 2003 with 'reduced volume pumping' for mitigation for each year or period of years as shown on the attached Mitigation Plan spreadsheet. The annual pumping volume was assumed to be distributed equally over the three trimesters for each year.

Historical pumping for the mitigation acres dried up at the Beckley farm was assumed to commence in 1974 which is the priority date of the water right and pumped continuously through 2002 at which time this pumping ceased under the 'with transfer' scenario. The base pumping (without transfer scenario) for the Beckley acres was assumed to continue for the period of the simulation.

3. The base depletion curve for the 'without transfer' is calculated by the program for each trimester for the period of simulation.

4. The depletion at each Snake River reach caused by the combination of pumping at the TO well, the residual depletion from the FROM well and the net effect of drying up the mitigation acres was determined by the spreadsheet program. This is termed the depletion 'with transfer'.

5. Pumping at the TO node and the number of acres dried up for mitigation and the resulting simulated volume of pumping at the mitigation site (Beckley) was adjusted over the period of the simulation in single years or groups of years so that the 'with transfer' depletion curve (net effects curve) for the Milner-King Hill reach was within $\pm 5\%$ of the base curve or 'without transfer' curve for the period after the commencement of pumping from the TO well. This reduced pumping volume below the transferred volume and the reduced pumping due to drying up acres for mitigation constitutes the "hydrologic mitigation" for this transfer. The reduced pumping volumes were determined by trial and error until a reasonable 'fit' to the base curve (without transfer) to within $\pm 5\%$ was accomplished for the simulation period.

6. The graphs for each of the 4 Snake River reaches show the comparison over time of the "net effect" on reach gains of the proposed transfer with the reduced pumping for mitigation. Also, the 'net percent transfer impact' for each reach is shown graphically.

7. The reduced pumping volume per year at the TO well and the acres dried up for mitigation was calculated for each year or group of years after commencement of pumping under the proposed transfer and is shown on the attached 'Mitigation Plan, Table I'

Proposed mitigation

The applicant will reduce pumping under the transferred water rights at the new points of diversion (Busman dairy) and dry up acres at the mitigation site (Beckley) in a quantity sufficient to assure that no additional impact to the Milner to King Hill reach is experienced. The quantity of reduced pumping and number of acres required to be dried up will change from time to time according to a schedule set out below. This reflects the dynamic nature of the relationship between the aquifer and the river.

The annual pumping volume proposed for mitigation and number of acres to be dried up is shown on the Mitigation Plan, Table I attached.

The 'Stipulations Regarding Mitigation' attached reflect this mitigation plan.

Stipulations Regarding Mitigation

Transfer Number 68993

John Busman-Busman Dairy

April 29, 2003

1. Mitigation

The Applicant has agreed to reduce pumping of those water rights under this water right transfer and to dry up additional previously irrigated acreage at the Beckley farm, and in a quantity sufficient to assure that no additional impact to the Milner to King Hill reach or any other reach is experienced. The quantity of reduced pumping and/or additional dry-up has been calculated and agreed to by the Parties. The reduced pumping schedule mitigates for the impact of the full annual volume applied for in the transfer application. The quantity of reduced pumping for each year and/or additional dryup is set out in the table(s) appended hereto. These mitigation requirements will be incorporated by the Department into the transfer approval and set out as permanent conditions on the affected water rights.

2. Monitoring of mitigation requirements

Discharge from the new well(s) will be monitored by the Applicant, in accordance with the Director's new water right transfer guidance or other applicable requirements as determined by the Director. The quantity of pumped volumes will be reported annually to IDWR .

3. Positive impacts on other reaches

The Department does not currently have a mechanism in place to recognize the positive impacts that a transfer may have on other river reaches within the Eastern Snake Plain Aquifer.

The Applicant and the Protestant have agreed that no "reach credits" will be recognized in conjunction with the approval of this transfer at this time. The Parties have agreed, however, that if such "reach credits" are recognized in the future by the Department or other appropriate entity, the

Applicant retains the right to apply for such credits based on this transfer. Likewise, the Protestant retains the right to oppose their recognition. If and when such credits are subsequently recognized, they will accumulate only from that point in time forward.

4. No reopening of mitigation calculation

The Applicant and the Protestant have agreed that the quantification of the mitigation obligation (as set out in the attached table(s)) will be permanent. The quantity of mitigation will not be subject to re-opening, re-examination, or re-calculation, except by mutual agreement and approval by the Department. This restriction applies even in the event that new data, new modeling or other information becomes available.

5. Substitute mitigation

As specified above, the mitigation will be provided in the form of reduced pumping and/or additional dry-up. No other method of achieving the mitigation may be substituted by the Applicant, except upon approval of the Department of an application for modification of the mitigation requirement as provided for by law. Moreover, the Protestant shall be given notice of such application.

In any event, the Protestant will not be required to accept any substitute form of mitigation that is less effective than the original mitigation. Specifically, any substitute mitigation must be "in kind" (meaning that it must provide a substitute supply of water—rather than some other kind of compensation—to make up for the depletions caused by the transfer), "in time" (meaning that the make-up water must be provided so as to reach the impacted area at the appropriate time to respond to the depletion caused by the transfer), and "in place" (meaning that the replacement must provide water to same area as the depletions are experienced). Finally, the substitute mitigation must provide water to the depleted impacted areas with the same degree of certainty and reliability as the original mitigation.

6. Consumptive use

The parties recognize that this transfer is premised upon the assumption of 100 percent consumptive use of water by the dairy. Consequently, the Applicant will be free to improve the efficiency of water

use in the future or make other changes under those rights that reduce or eliminate any return flows, without providing further mitigation.

John Busman
Busman Dairy

Bonnie B. Beckley

R. K. Beckley

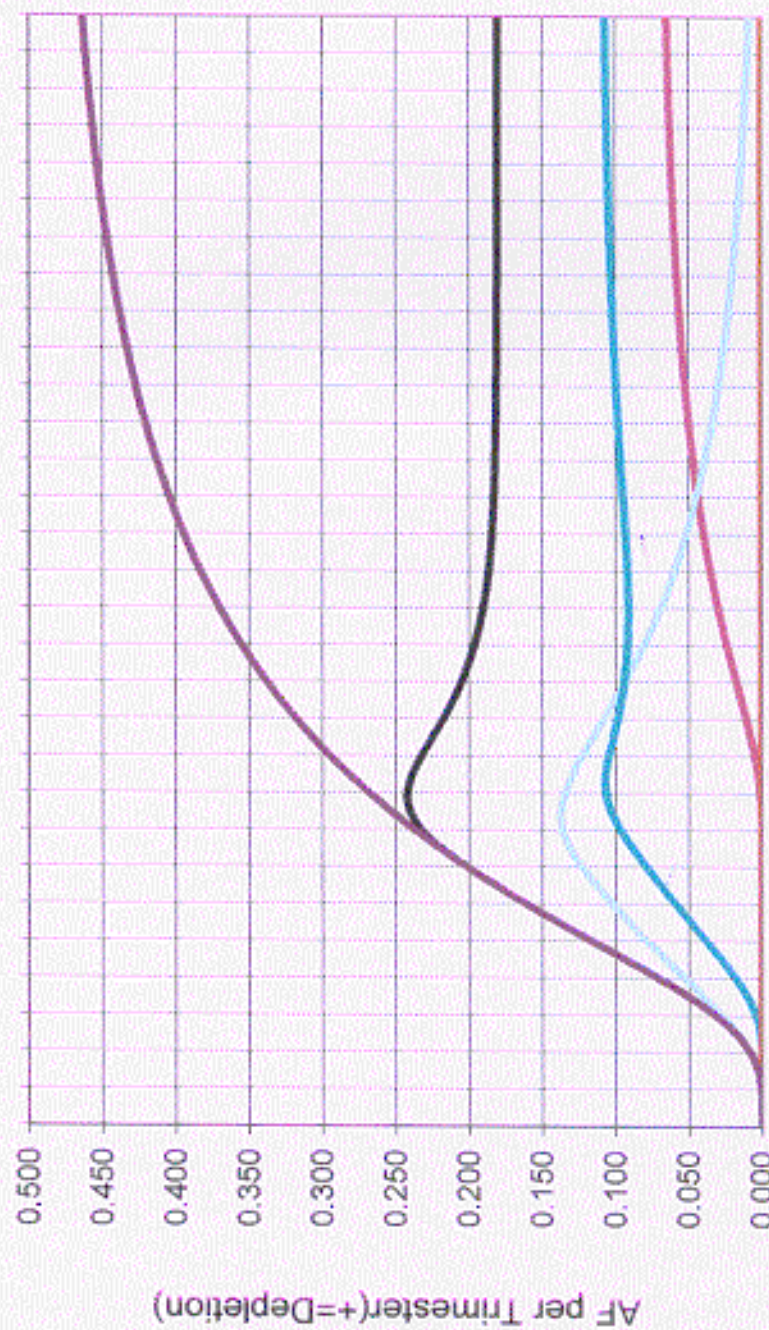
Table 1 Proposed Pumping Schedule Mitigation Plan

TRANSFER NO 1		FROM: Larsen		Model Node						
Applicant: Bussman/Larsen				9 22						
Transfer # 68993		TO: Bussman		10 13						
Acres dried up to transfer		20 acres		Larsen						
Allowed vol. transfer		2.69 af/a								
Volume Transferred:		53.8 af/year								
		17.9 af/trimester								
Desired pumping		60.0 af/year								
		20.0 af/trimester								
TRANSFER NO 2		NONE		Model Node						
Applicant:		0								
Transfer #		0								
Acres dried up to transfer		0 acres								
Allowed vol. transfer		4 af/a								
Volume Transferred:		0.0 af/year								
		0.0 af/trimester								
MITIGATION ACRES (if any)		21.1 acres		Model Node						
Additional acres dried up		2.84 af/a		14 16						
Allowed transfer		60.0 af/year								
Volume (Mitigation)		20.0 af/trimester								
ANNUAL PUMPING										
Begin	Years End	Number	%Acres	Mitigation Actual Af/yr	Transfer #1		Transfer #2			
					Bussman Pumping af/year	Percent of Max	Percent Reduction	Pumping af/year	Percent of Trans	Percent Reduction
					27.0	0.45	0.55	0.0	0	0
					48.0	0.80	0.20	0.0	0	0
					48.0	0.80	0.20	0.0	0	0
					48.0	0.80	0.20	0.0	0	0
					55.2	0.92	0.08	0.0	0	1.00
					58.8	0.98	0.02	0.0	0	1.00
					58.8	0.98	0.02	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
					60.0	1.00	0.00	0.0	0	1.00
2073 >>>>										
Mitigation for impacts to reaches of the Snake River will be achieved by drying up acres at the Beckley farm and reduced pumping at the proposed place of use according to the above table..										

Hydrologic Response--Heise/Ashton to Lewisville

Transfer No: 68993 Applicant: Bussman/Larsen

SPR 1967 SPR 1977 SPR 1987 SPR 1997 SPR 2007 SPR 2017 SPR 2027 SPR 2037 SPR 2047 SPR 2057 SPR 2067 SPR 2077 SPR 2087 SPR 2097 SPR 2107

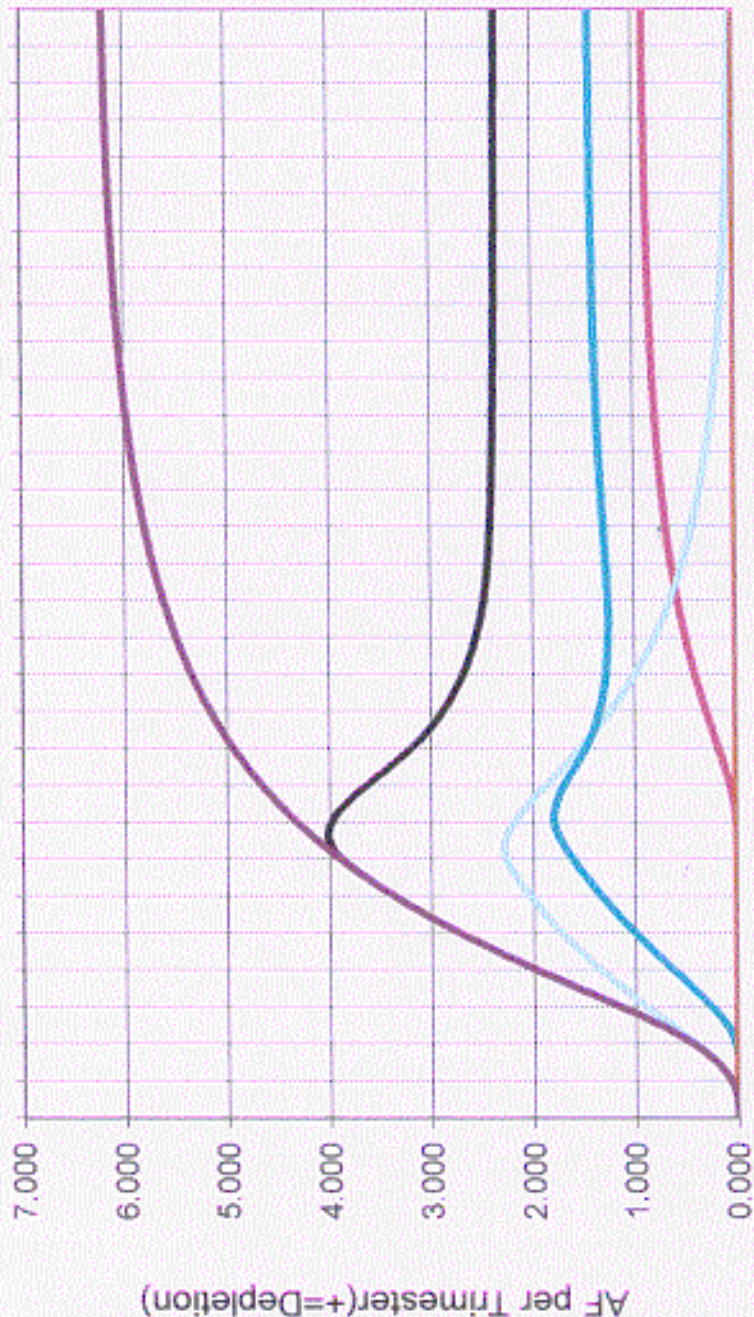


— Total Effect With Transfer — TO Well Effects — FROM1 Well
 — FROM 2 Well — FROM3 Well — Total Effect Without Transfer

Hydrologic Response--Near Shelley to Neeley Reach

Transfer No: 68993 Applicant: Bussman/Larsen

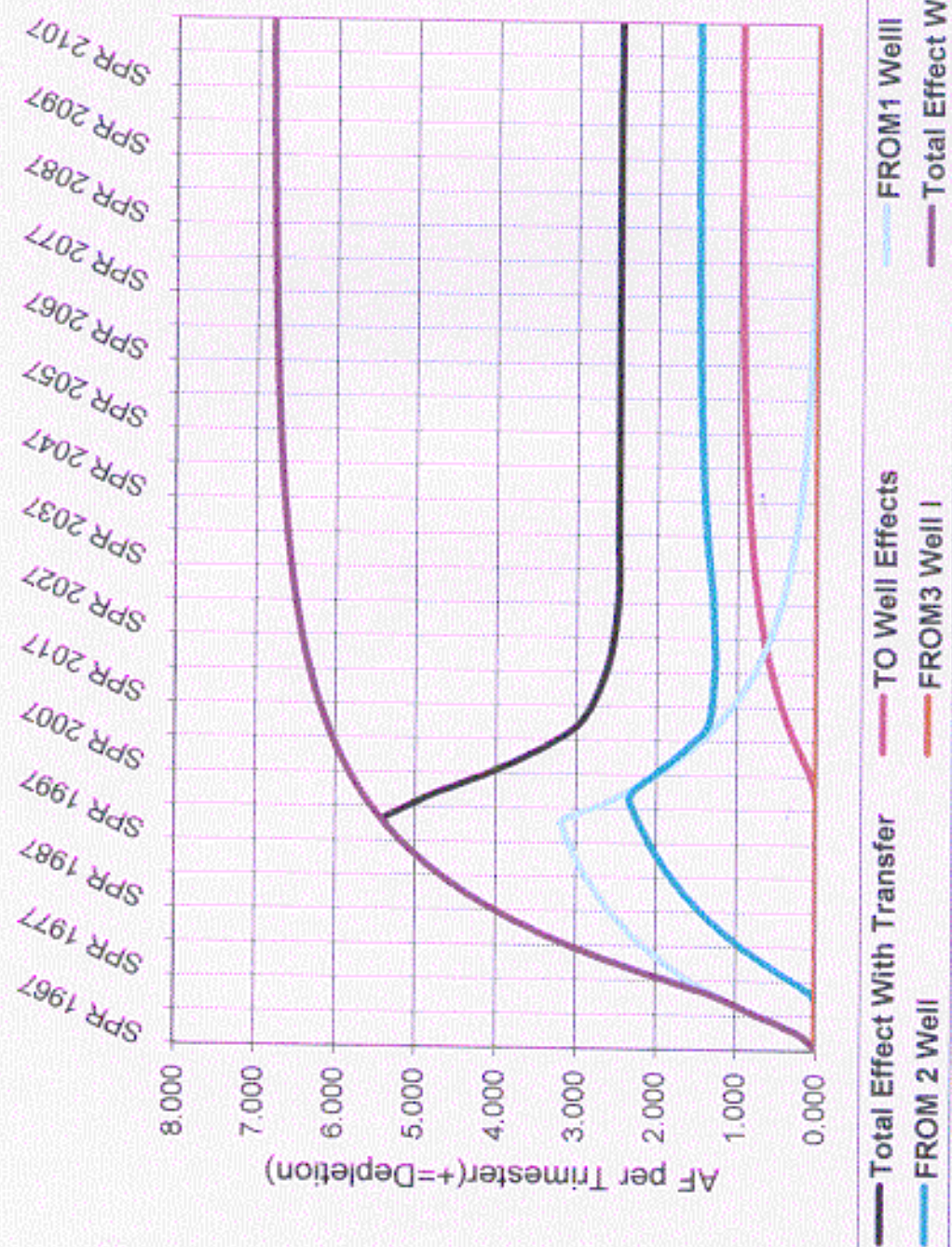
SPR 1967 SPR 1977 SPR 1987 SPR 1997 SPR 2007 SPR 2017 SPR 2027 SPR 2037 SPR 2047 SPR 2057 SPR 2067 SPR 2077 SPR 2087 SPR 2097 SPR 2107



Hydrologic Response--Neeley to Minidoka

Transfer No: 68993 **Applicant:**

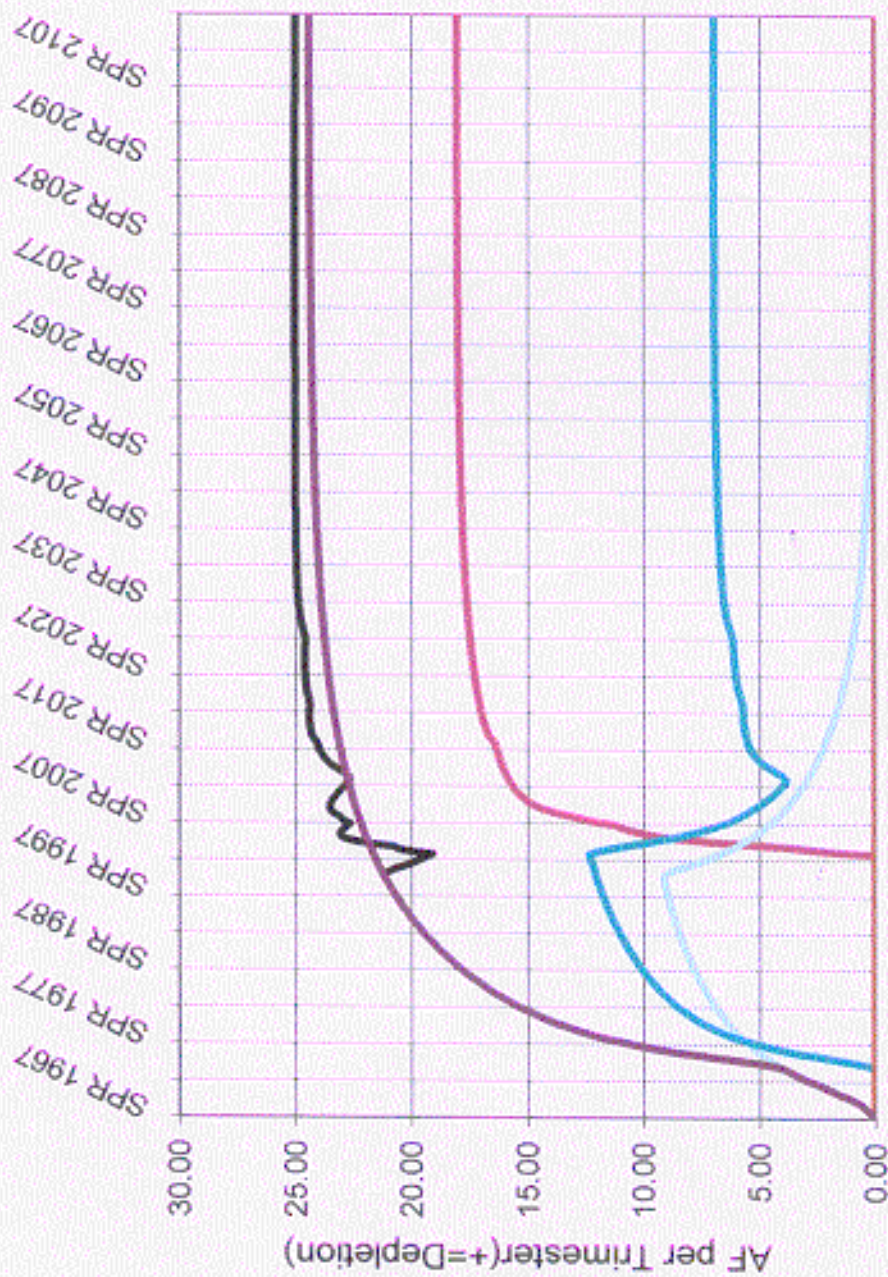
Bussman/Larsen



Hydrologic Response-- Milner to King Hill Reach

Transfer No.:68993

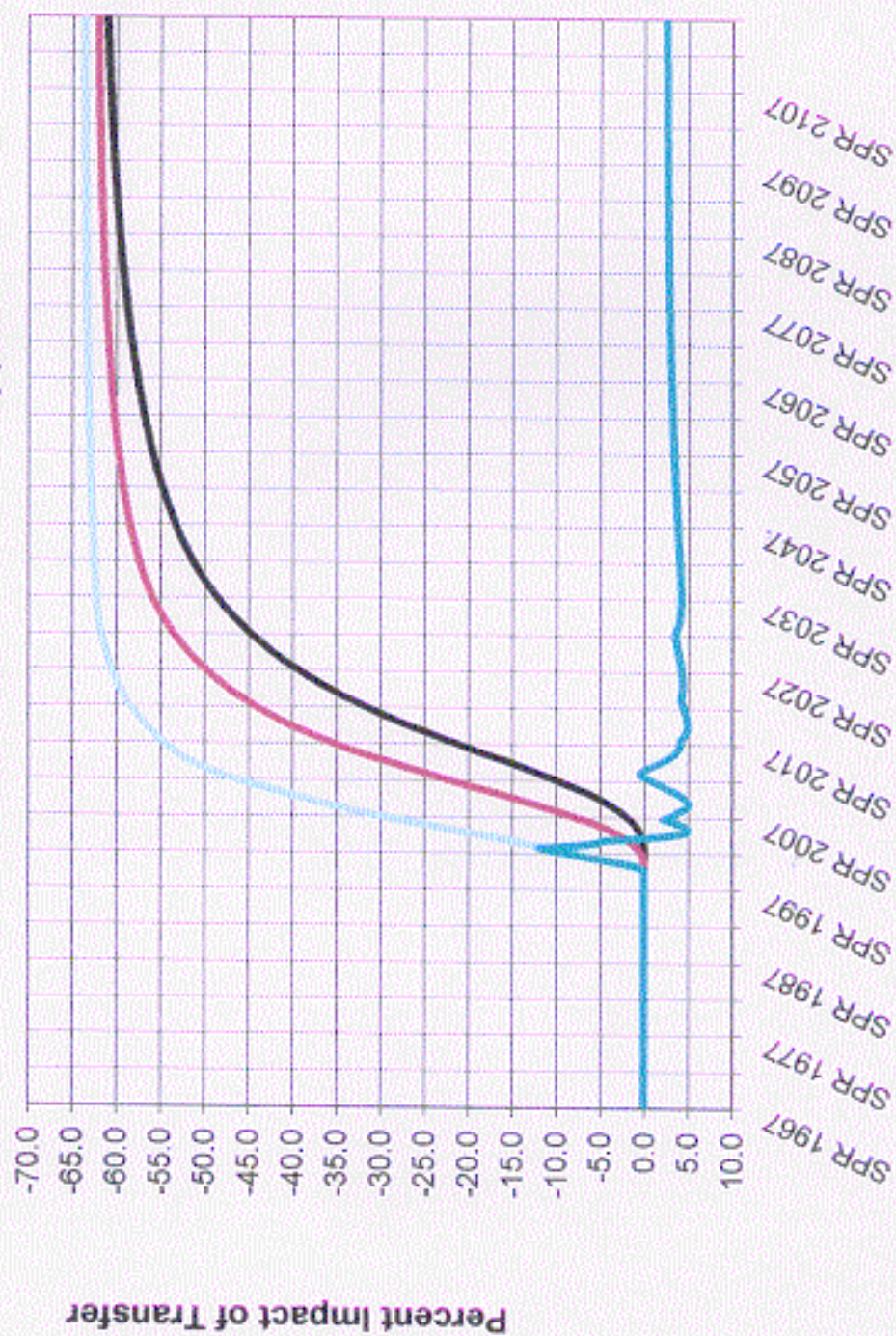
Applicant: Bussman/Larsen



Net Percent Transfer Impact

Transfer No: 68993

Applicant: Bussman/Larsen

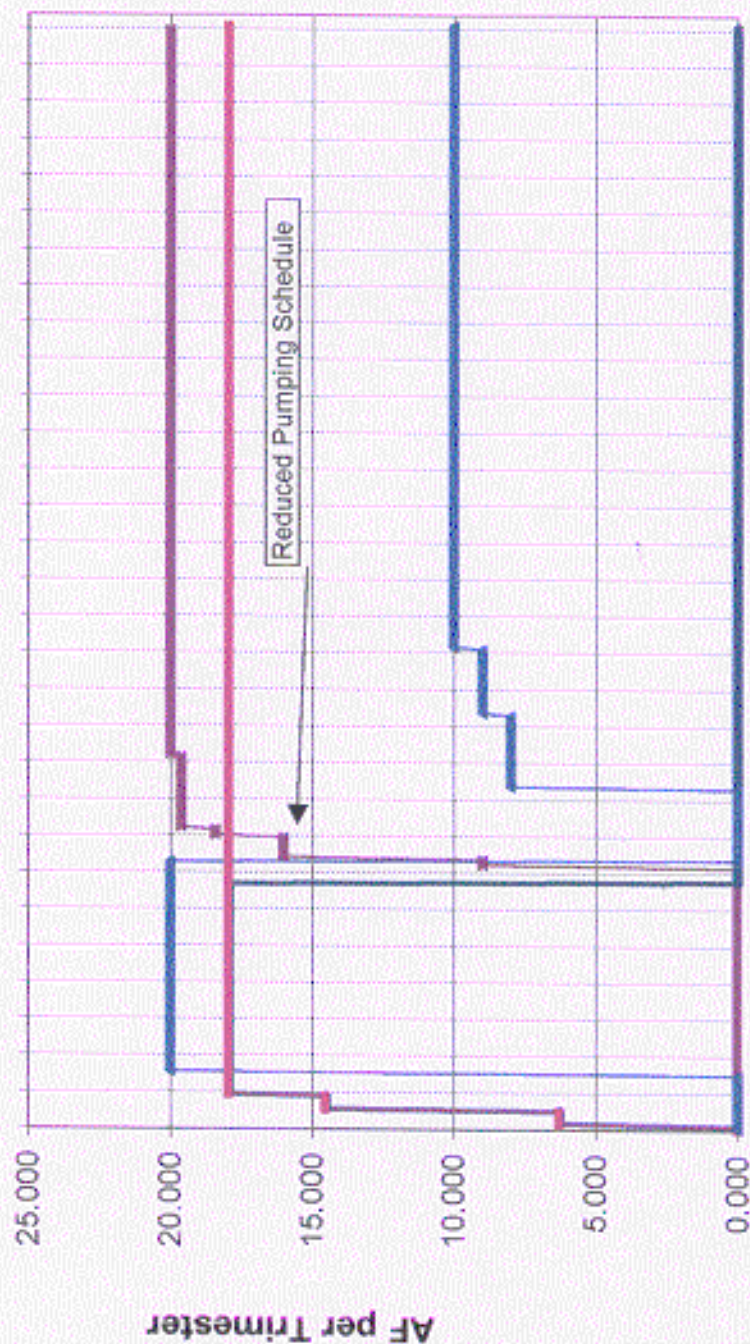


Pumping and Mitigation Schedule

Transfer No: 68993

Applicant: Bussman/Larsen

SPR 1967
SPR 1977
SPR 1987
SPR 1997
SPR 2007
SPR 2017
SPR 2027
SPR 2037
SPR 2047
SPR 2057
SPR 2067
SPR 2077
SPR 2087
SPR 2097
SPR 2107



TO Well From 1 Well w/ Transfer From 2 Well (Mitigation)