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**DEPARTMENT OF
WATER RESOURCES**

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IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT
OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re: SRBA

Case No. 39576

Subcase Nos. 63-00123D, 63-00123F &
63-00123G

**DIRECT TESTIMONY OF TERRY M.
SCANLAN, P.E., P.G.**

INTRODUCTORY TESTIMONY

Q. Please state your name.

A. Terry Scanlan.

Q. By whom are you employed and in what capacity?

A. I am a Principal Engineer and co-founder of SPF Water Engineering, LLC, an engineering firm founded in March 2004 to provide hydrologic characterization, water resource development, and water system engineering services.

Q. Prior to founding SPF Water Engineering, LLC, with whom were you employed and in what capacity?

A. I formed Scanlan Engineering in 1994 to provide engineering and hydrogeologic consulting to public and private clients. Prior to that I was a supervising hydrogeologist for

Montgomery Watson in Boise, Idaho from 1986 to 1994, where I managed and conducted investigations related to ground water development and ground water contamination

Q. What is your educational background?

A. I have a B.S., Geological Engineering and a M.S., Geological Engineering, both from the University of Idaho

Q. What professional certificates do you hold?

A. I am a registered Professional Engineer in Idaho (No. 6266, 1990) and a registered Professional Geologist in Idaho (No. 646, 1989) and Oregon (No. G1311, 1992).

Q. Briefly describe your experience in analyzing the irrigation requirement of crops.

A. I have completed evaluations of irrigation development and consumptive water use related to hundreds of water right claims, permit applications and transfers throughout southern Idaho.

Q. Have you ever been qualified as an expert witness in court proceedings?

A. Yes. I have testified as an expert witness in surface water and ground water interactions, well interference, groundwater development, and consumptive water use related to water rights in administrative proceedings before the Idaho Department of Water Resources on numerous occasions. I have provided expert witness reports related to irrigation requirements and water rights in Snake River Basin Adjudication Court proceedings. I have testified in District Court on a water right dispute.

OVERVIEW OF SUBDIVISION ACREAGE AND WATER RIGHTS

Q. Describe the nature of the work you have done for Lexington Hills Inc. in this case.

A. I was asked to estimate the quantity of water needed to irrigate the areas within the Lexington Hills Subdivision served by the HOA's pressurized irrigation system. I understand

that the service area includes all of Lexington Hills Subdivision Nos. 1-12, Lexington on the Rim, and Lexington Hills East Nos 1 and 2.

Q. In your review did you analyze the water rights historically used to irrigate the area now covered by the Subdivision?

A. Yes.

Q. Please describe what you found.

A. The entire project area is 328 acres. It is comprised of 3 different areas (collectively referred to as the Subdivision):

- 1) Lexington Hills Subdivision Nos. 1-12;
- 2) Lexington Hills East Nos. 1 and 2; and
- 3) Lexington on the Rim.

A graphic depiction of these areas as well as a summary of the total acreage in each area is included in Exhibit 1. I have been informed that 204.00 inches (4.08 cfs) is appurtenant to the Lexington Hills Subdivision Nos. 1-12 (the Jacobs Right), that 26.23 inches (0.46 cfs) of right 63-123 is appurtenant to Lexington Hills East Nos. 1 and 2, and that no water was historically appurtenant to the Lexington on the Rim Property. In addition, I have been informed that an assortment of entitlements to delivery from the Farmers Union Canal Company totaling 9.11 inches (0.18 cfs) is delivered to the Subdivision. In summary, there are a total of 239.34 inches of water appurtenant to the 328 acres included within the Subdivision. This equates to a combined duty of water of 0.73 inches per acre. Excluding Lexington Hills on the Rim, the historic duty of water is 0.78 inches per acre.

CALCULATION OF WATER DEMAND

Q. Briefly describe the approach you used to estimate the water required to irrigate the Subdivision.

A. Water is delivered to the Subdivision via the Farmer's Union Canal. There is no weir or other measuring device to measure the quantity of water. Nor is there any measuring device to measure the water actually being pumped by the pressurized irrigation system. Consequently, I had to estimate the irrigation requirement for the irrigated areas in the Subdivision.

Q. How did you make this estimate?

A. First, Scott King, P.E., and engineer at SPF Water Engineering calculated the irrigated acreage within the Subdivision under my direction. To do this, we first divided the Subdivision into four land use categories: roads, common areas, schools and residential lots. These land uses are depicted on Exhibit 2. I then used 2003 aerial imagery (provided by Ada County Assessor's office) and ESRI® ArcMap™ version 9.2 Geographic Information System (GIS) software to estimate total acreage and irrigated acreage within each land use category.

Q. How did you determine the irrigated area for roads?

A. Roads within Lexington Hills were treated as one unit. Roads cover approximately 50.4 acres and are considered non-irrigated. Small irrigated islands within roadways are included in common areas.

Q. How did you determine the irrigated area for common areas?

A. Common areas within the Lexington Hills subdivisions comprise a total of about 42.7 acres. Nearly all of the common areas are either irrigated landscape or ponds, except for limited lands covered by small structures, sidewalks, or other limited non-irrigated areas. Pond area within commons comprises about 3.7 acres.. Non-irrigated area within common areas was estimated at 3 acres based on visual approximation.

Q. How did you determine the irrigated area for schools?

A. One school is located within Lexington Hills (Seven Oaks Elementary). Approximately 5.4 acres of the 10-acre property are irrigated based on digitized area determinations using 2003 aerial imagery.

Q. How did you determine the irrigated area for residential lots?

A. Approximately 634 residential lots are included within the Subdivision. These lots range from about 0.11 to 1.62 acres in size. Irrigated area within residential lots was determined by a multi-step process. First, lots were grouped into four size categories. Second, a representative number of lots were selected from each size category. The locations of these lots are depicted on Exhibit 3. Third, irrigated area was determined for the sample lots based on detailed digitized area determinations using GIS tools and 2003 Ada County aerial imagery. A sample of digitized irrigated area is presented in Exhibit 4. Finally, the percent irrigated area within each sample group was extrapolated to determine the approximate total irrigated area within residential lots. This is summarized in Exhibit 5.

Q. What is the next step in calculating the irrigation demand?

A. I calculated the irrigation requirement based on estimated irrigation efficiency and the estimated evapotranspiration (ET) requirements. Irrigation efficiency for sprinkler irrigated landscape will vary depending on system management. For purposes of this analysis, efficiency likely varies between 50 percent for poorly managed systems to 100 percent for pond surfaces. Efficiency increases with warmer weather when consumptive irrigation requirement is higher and over watering is less likely, and decreases during cooler periods when consumption is lower and more water can infiltrate into the soil profile. A reasonable estimate of average irrigation

efficiency for solid set landscape sprinklers during periods of peak irrigation requirement is 70 percent or higher.

Q. What did you do next?

A. I estimated the precipitation deficit. The precipitation deficit (P_{def}) is the difference between the potential ET (ET_{pot}) and the amount of precipitation in the root zone. P_{def} was calculated as $ET_{pot} - P_{rz}$ where P_{rz} is the precipitation infiltrating into and residing in the root zone. P_{def} is synonymous with the net irrigation water requirement when occurring during the growing season for an irrigated crop. P_{def} represents the amount of additional water that the crop would evaporate or transpire beyond P_{rz} if that water were made available at the right time during the growing season. The precipitation deficit is generally the most appropriate "ET" parameter to use for irrigation system design.

Q. What did you find when you estimated the ET by calculating the precipitation deficit?

A. The precipitation deficit is provided for a variety of crops and weather station sites by the University of Idaho at the ET Idaho website (<http://www.kimberly.uidaho.edu/ETIdaho/>). I referenced the data from this site for four weather stations surrounding Lexington Hills at roughly equal distances. These stations are Boise, Nampa, Caldwell, and Emmett. I pulled data for three crop types: turf (lawn), orchard with ground cover, and open water. These crop types reflect potential irrigation requirements for open lawn areas, ponds and waterways, and landscape with trees and lawn. For my analysis, I assumed a representative mix of 80 percent turf, 18 percent orchard with ground cover, and 2 percent open water.

Q. Is this a variable that could affect the outcome of the analysis?

A. Yes, and my choice of this mix is conservative. For example, while the ET Idaho website precipitation deficit numbers for orchards with ground cover are relatively high, a significant

portion of the area I attribute to orchards with ground cover in my analysis is actually shrub beds that are less consumptive. Also, the precipitation deficit numbers from the ET Idaho website assume that 100 percent of the irrigated area is a thriving "crop" producing a maximum yield and is not stressed by lack of water or nutrients. In reality, a portion of the landscape area in any irrigation system consists of areas that are not growing at their maximum potential rate, and some portions are stressed by lack of water or fertilizer due to irrigation management. Consequently, the actual on-the-ground ET for these area is less than the theoretical numbers.

Q. What other variables affect the analysis?

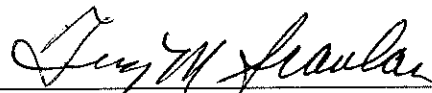
A. The ET Idaho website includes a variety of statistical precipitation deficit data. The choice of the statistical category has a large effect on the outcome. I have summarized the data in the chart that is Exhibit 6. The list of the statistical categories and a short explanation is included in Exhibit 7. The table in Exhibit 8 then summarizes my calculation of the precipitation deficit made by taking the data from Exhibit 6 and applying the 80/18/2 crop mix for the 170 irrigated acres within the Subdivision with a 70% irrigation efficiency. You can see there is a wide range in outcomes. For example, using the peak monthly mean data, the total precipitation deficit is 130.66 inches (0.77 inches per acre). Using the 20% exceedence 3-day moving average yields a total precipitation deficit of 183.38 inches (1.08 inches per acre).

Q. Based on this analysis, do you believe the homeowners and the Homeowners Association can sufficiently irrigate the irrigated areas within the Subdivision using the historic duty of water of 0.78 inches per acre?

A. Yes. My analysis shows that the peak monthly mean 15-day average equates to a duty of water of 0.78 inches per acre. On an unusual year with a string of very hot days the irrigation requirement will exceed the available water and the lawns could experience some stress, but this

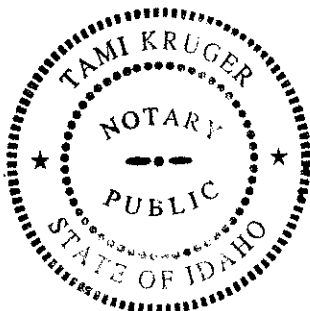
is not unusual and any permanent damage even in this exceptional circumstance is unlikely because turf grass is a resilient crop that can enter a dormant state in a drought stress situation and then can quickly recover. The pond system in the Subdivision also could serve as a storage reservoir to potentially provide some additional water to supplement through the peak demand. Moreover, as I explained earlier, the numbers from the ET Idaho website are conservative in that they assume a thriving crop that is experiencing no stress. Therefore, I have likely overestimated the consumptive irrigation requirement by assuming that water use in shrub areas is equivalent to use in orchards with ground cover.

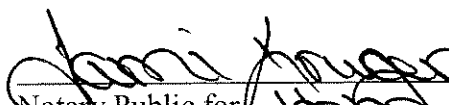
DATED this 10th day of March, 2008.


Terry M. Scanlan, P.E., P.G.

SUBSCRIBED AND SWORN TO before me this 10th day of March, 2008.

[seal]




Notary Public for Idaho
Residing at Boise, ID
My commission expires 4-25-2011

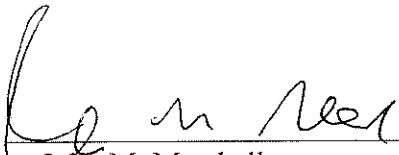
CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing document was mailed on March 11, 2008, with sufficient first-class postage to the following:

Lexington Hills Homeowners Association
2354 N. Stonecrest Place
Eagle, ID 83616
Phone: 208-364-8624

Lexington Hills Homeowners
John K. Simpson
1010 W. Jefferson Street, Ste. 102
PO Box 2139
Boise, Idaho 83701-2139
Phone: 208-336-0700

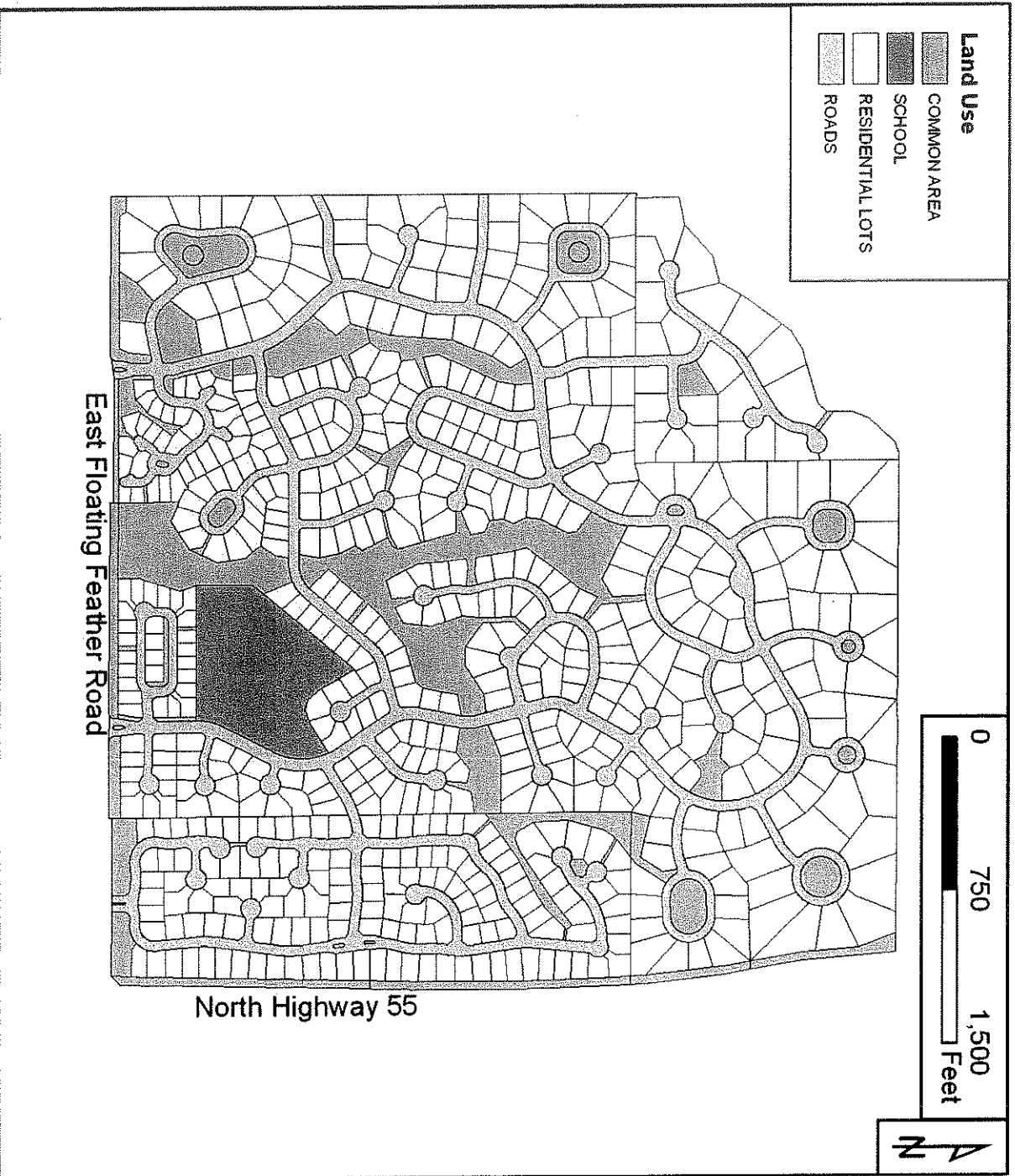
Director of IDWR
PO Box 83720
Boise, Idaho 83720-0098

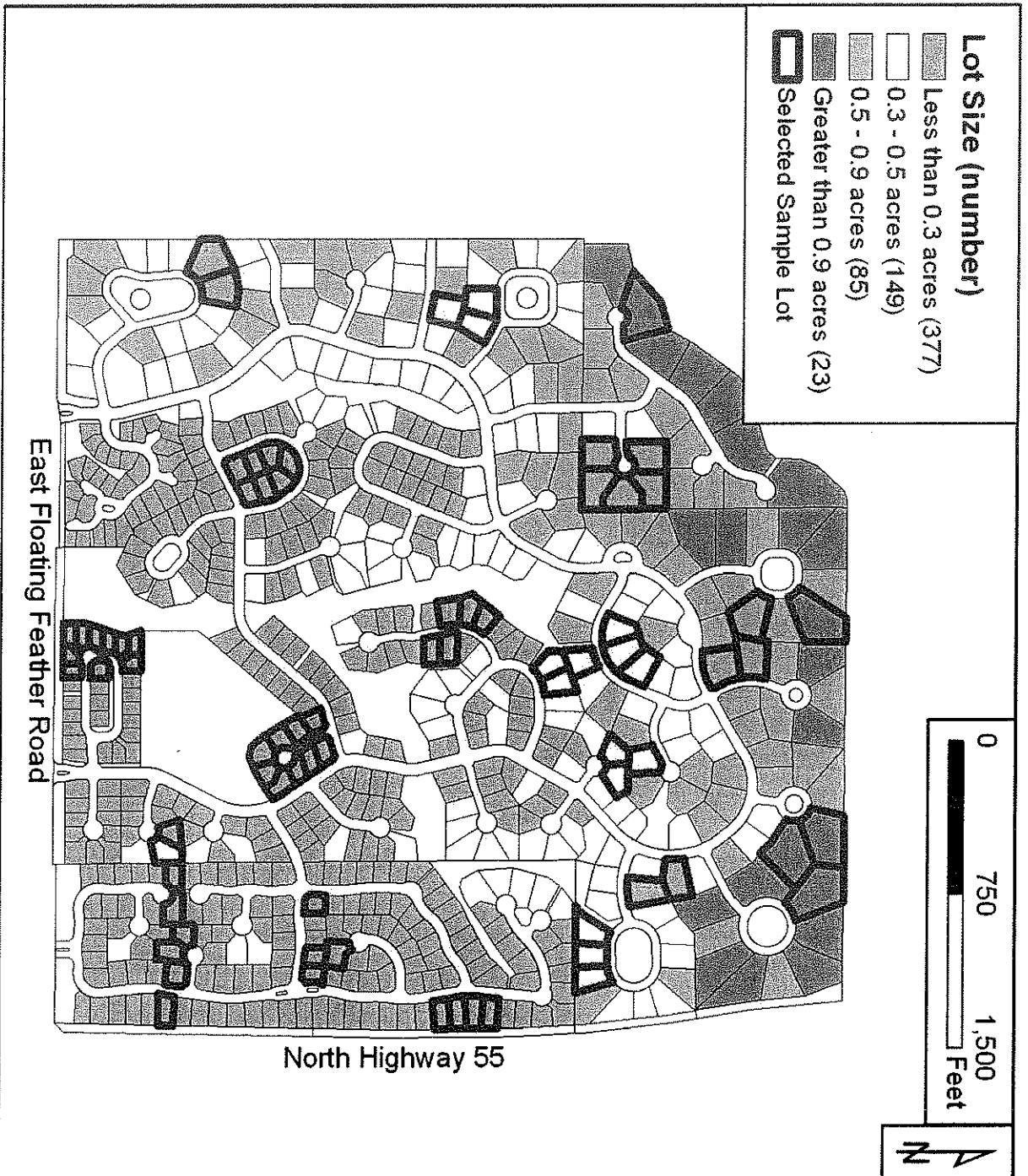
By: 
John M. Marshall



AREA	ACRES
Lexington Hills Subdivision Nos. 1-12	256.6
Lexington Hills East Nos. 1 and 2	50.0
Lexington on the Rim	21.2
Total	327.8

EXHIBIT 1





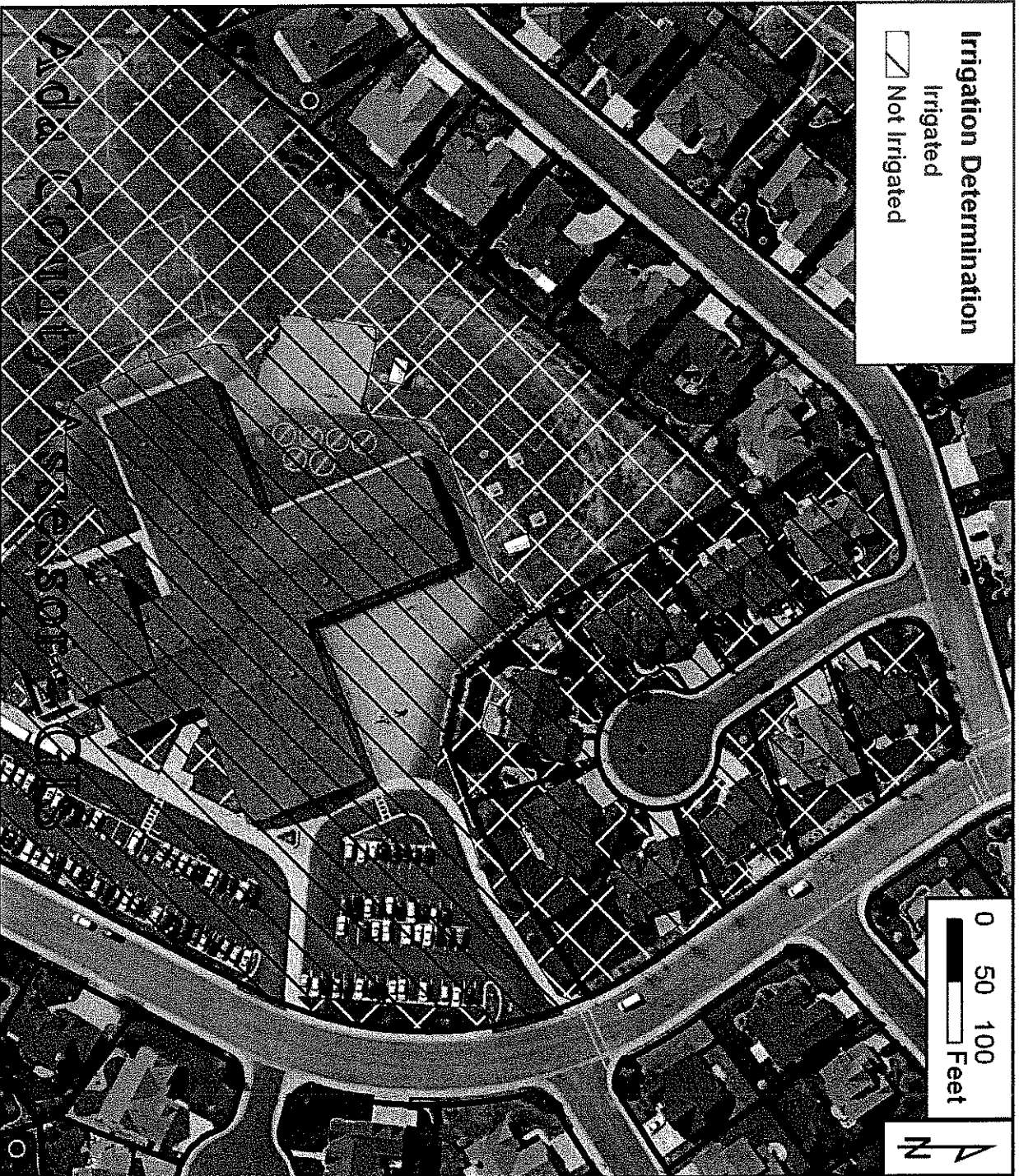


EXHIBIT 4

LAND USE ACREAGE TOTALS

Category	Number of Units	Irrigated Acres	Dry Acres	Pond Acres	Total Acres	Portion of Area Irrigated or Ponds
Roads	1	0.0	50.4	0	50.4	0%
Common Areas	55	36.0	3.0	3.7	42.7	93%
School	1	5.4	4.6	0	10.0	54%
Residential Lots	634	124.6	100.4	0	225.0	55%
Total	691	166.0	158.4	3.7	328.1	52%

RESIDENTIAL LOT ACREAGE TOTALS

Lot Size (acres)	Number of Units	Total Acres	Number of Units Selected	Irrigated Acres	Non-Irrigated Acres	Sum	% Acres Irrigated	Extrapolated Total Irrigated Acres
Less than 0.3	377	86.8	45	5.7	4.8	10.6	54%	47.1
0.3 TO 0.5	149	60.3	16	3.2	3.2	6.5	50%	30.1
0.5 TO 0.9	85	52.4	12	4.5	2.9	7.4	61%	32.0
Greater than 0.9	23	25.4	5	3.4	2.2	5.6	61%	15.4
Total	634	224.9	78.0	16.8	13.1	30.0	56%	124.6

July Precipitation Deficit Summary (mm/day)

	Caldwell			Boise			Nampa			Emmett			4-Station Average		
	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds
Peak Month Mean															
Monthly	7.11	7.09	5.15	6.55	6.90	4.70	6.61	7.07	4.78	5.69	6.05	4.03	6.49	6.78	4.67
15-day Moving Average	7.15	7.17	5.20	6.64	7.05	4.77	6.61	7.16	4.79	5.76	6.17	4.11	6.54	6.89	4.72
7-Day Moving Average	7.15	7.16	5.20	6.61	6.99	4.75	6.63	7.10	4.79	5.72	6.12	4.08	6.53	6.84	4.71
3-Day Moving Average	7.12	7.11	5.16	6.56	6.93	4.71	6.62	7.08	4.79	5.70	6.07	4.05	6.50	6.80	4.68
20% Exceedence															
Monthly	7.58	7.95	5.52	6.94	7.46	5.07	6.94	7.52	4.93	6.01	6.71	4.31	6.87	7.41	4.96
15-day Moving Average	8.13	8.82	5.81	7.62	8.54	5.48	7.49	8.37	5.43	6.43	7.27	4.67	7.42	8.25	5.35
7-Day Moving Average	8.48	9.63	6.14	8.24	9.37	5.87	8.06	8.75	5.80	6.82	7.66	4.94	7.90	8.85	5.69
3-Day Moving Average	9.59	10.51	6.57	9.18	9.98	6.40	9.44	10.18	6.38	8.04	8.37	5.29	9.06	9.76	6.16
Average Highest ET															
15-day Moving Average	7.70	7.93	5.55	7.23	7.79	5.24	7.16	8.09	5.21	6.18	6.75	4.46	7.07	7.64	5.12
7-Day Moving Average	8.17	8.65	5.89	7.80	8.55	5.61	7.80	8.71	5.63	6.51	7.27	4.70	7.57	8.30	5.46
3-Day Moving Average	9.33	9.86	6.33	8.90	9.65	6.12	8.94	9.66	6.09	7.64	8.03	5.03	8.70	9.30	5.89

July Precipitation Deficit Summary (in/day)

	Caldwell			Boise			Nampa			Emmett			4-Station Average		
	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds	Lawns	Orchard	Ponds
Peak Month Mean															
Monthly	0.28	0.28	0.20	0.26	0.27	0.19	0.26	0.28	0.19	0.22	0.24	0.16	0.26	0.27	0.18
15-day Moving Average	0.28	0.28	0.20	0.26	0.28	0.19	0.26	0.28	0.19	0.23	0.24	0.16	0.26	0.27	0.19
7-Day Moving Average	0.28	0.28	0.20	0.26	0.28	0.19	0.26	0.28	0.19	0.23	0.24	0.16	0.26	0.27	0.19
3-Day Moving Average	0.28	0.28	0.20	0.26	0.27	0.19	0.26	0.28	0.19	0.22	0.24	0.16	0.26	0.27	0.18
20% Exceedence															
Monthly	0.30	0.31	0.22	0.27	0.29	0.20	0.27	0.30	0.19	0.24	0.26	0.17	0.27	0.29	0.20
15-day Moving Average	0.32	0.35	0.23	0.30	0.34	0.22	0.29	0.33	0.21	0.25	0.29	0.18	0.29	0.32	0.21
7-Day Moving Average	0.33	0.38	0.24	0.32	0.37	0.23	0.32	0.34	0.23	0.27	0.30	0.19	0.31	0.35	0.22
3-Day Moving Average	0.38	0.41	0.26	0.36	0.39	0.25	0.37	0.40	0.25	0.32	0.33	0.21	0.36	0.38	0.24
Average Highest ET															
15-day Moving Average	0.30	0.31	0.22	0.28	0.31	0.21	0.28	0.32	0.21	0.24	0.27	0.18	0.28	0.30	0.20
7-Day Moving Average	0.32	0.34	0.23	0.31	0.34	0.22	0.31	0.34	0.22	0.26	0.29	0.19	0.30	0.33	0.21
3-Day Moving Average	0.37	0.39	0.25	0.35	0.38	0.24	0.35	0.38	0.24	0.30	0.32	0.20	0.34	0.37	0.23

Data source: <http://www.kimberly.uidaho.edu/ETIdaho/>

- Mean Monthly. The mean of the average daily value for month
- Mean 15-Day Moving Average. The mean of the fourteen 15-day period averages contained in the month
- Mean 7-Day Moving Average. The mean of the twenty three 7-day period averages contained in the month
- Mean 3-Day Moving Average. The mean of the twenty seven 3-day period averages contained in the month
- 20% Exceedance 15-Day Moving Average. The mean of the 15-day period that is higher than 4/5 of the fourteen 15-day period averages contained in the month
- 20% Exceedance 7-Day Moving Average. The mean of the 7-day period that is higher than 4/5 of the twenty three 7-day period averages contained in the month
- 20% Exceedance 3-Day Moving Average. The mean of the 3-day period that is higher than 4/5 of the twenty seven 3-day periods contained in the month.
- Average Highest ET 15-Day Moving Average. The mean of the highest 15-day period average in the month.
- Average Highest ET 7-Day Moving Average. The mean of the highest 7-day period average in the month.
- Average Highest ET 3-Day Moving Average. The mean of the highest 3-day period average in the month.

System July Irrigation Delivery Requirement (cfs/day)**		
Efficiency	70%	Per acre
Peak Month Mean	80/18/2 mix	
Monthly	2.61	0.02
15-day Moving Average	2.64	0.016
7-Day Moving Average	2.63	0.015
3-Day Moving Average	2.62	0.015
20% Exceedence		
Monthly	2.78	0.016
15-day Moving Average	3.02	0.018
7-Day Moving Average	3.22	0.019
3-Day Moving Average	3.67	0.022
Average Highest ET		
15-day Moving Average	2.86	0.02
7-Day Moving Average	3.08	0.02
3-Day Moving Average	3.52	0.02

**Irrigated area (acres) = 170

System July Irrigation Delivery Requirement (miners inches/day)**		
Efficiency	70%	Per acre
Peak Month Mean	80/18/2 mix	
Monthly	130.66	0.77
15-day Moving Average	131.88	0.78
7-Day Moving Average	131.51	0.77
3-Day Moving Average	130.90	0.77
20% Exceedence		
Monthly	139.13	0.82
15-day Moving Average	151.16	0.89
7-Day Moving Average	161.23	0.95
3-Day Moving Average	183.38	1.08
Average Highest ET		
15-day Moving Average	143.24	0.84
7-Day Moving Average	153.82	0.90
3-Day Moving Average	175.83	1.03

**Irrigated area (acres) = 170