



1 to individuals who attended the public hearing in this matter described below. A copy of this  
2 description and list is attached hereto as Exhibit A.

3           Upon determining that the Petition was signed by not less than one-fourth of the irrigation  
4 users of groundwater within the sub-basin, as required by A.R.S. § 45-435, the Department  
5 published a Notice of Initiation of Designation Procedures and Notice of Public Hearing on March  
6 18, 2015 and March 25, 2015 (“Notice”) in the Arizona Range News, a newspaper of general  
7 circulation in Cochise County, and the Eastern Arizona Courier, a newspaper of general circulation  
8 in Graham County. The first publication of the Department’s Notice triggered a prohibition on the  
9 irrigation of any land within the San Simon Valley Sub-basin that was not irrigated between March  
10 18, 2010 and March 18, 2015. The Notice advised that a public hearing would be held in Bowie,  
11 Arizona, on May 16, 2015 at 2:00 p.m. and that written comments and evidence regarding the  
12 proposed INA would be received by the Department until May 22, 2015 at 5:00 p.m.

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14           **II. Public Hearing and Comment Period**

15           The Department held a public hearing in Bowie, Arizona on May 16, 2015. At the hearing,  
16 the Department’s Chief Hydrologist, Frank Corkhill, presented factual data then in the  
17 Department’s possession related to groundwater supply, demand, and conditions in the San Simon  
18 Valley Sub-basin. Mr. Corkhill presented information derived from water level measurements  
19 which the Department collected pursuant to a sub-basin-wide data collection effort in February and  
20 March of 2015. At the time of the hearing, the Department had designated its water level data as  
21 “Preliminary-Subject to Revision” because the Department had not yet completed its regular  
22 internal review and quality assurance processes with respect to the data. Also at the time of the May  
23 16 hearing, the Department was developing but had not yet completed a numerical groundwater  
24 model for use in projecting groundwater level changes and groundwater flow behavior in the sub-  
25 basin in response to 100 years of future pumping at current rates of groundwater withdrawal.

1 During the public hearing, the Department received oral and written comments both for and  
2 against the proposed INA. Upon request by more than one member of the public, the Department  
3 announced at the public hearing that it would extend the comment period to June 5, 2015 to provide  
4 the public with additional time to review and comment on the information presented at the hearing.

5 Shortly after the hearing, the Department completed its regular review processes with  
6 respect to its water level data. On May 29, 2015, the Department provided notice to individuals  
7 who had attended the May 16 hearing and all landowners of county record in the sub-basin that it  
8 would extend the public comment period until July 17, 2015. The comment period was extended  
9 so that the Department could present and the public could comment on finalized water level data,  
10 as well as the Department's groundwater model, which the Department anticipated completing no  
11 later than June 17, 2015. The Department made its finalized water level data and model publicly  
12 available on June 1, 2015, and June 17, 2015, respectively, by posting the information on its website  
13 and making hard copies of the documents available upon request.

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15 Approximately 40 people made oral comments at the May 16 hearing, and the Department  
16 received approximately 95 written comments regarding the proposed INA during the public  
17 comment period. The Director has given consideration to all comments which were made at the  
18 public hearing and which were made in writing and timely submitted. Where particular comments  
19 are relevant to a specific Finding made by the Director, the comments are discussed in the  
20 "Findings" section below.

### 21 **III. Determination on Whether to Designate an INA**

22 As provided in A.R.S. § 45-432(B), the Director may designate a groundwater sub-basin as  
23 an INA if the Director determines that both of the following apply:

- 24 1. There is insufficient groundwater to provide a reasonably safe supply for irrigation of the  
25 cultivated lands in the area at the current rates of withdrawal; and  
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1           5.       A few commenters claim that the Department's Petition analysis is invalid because  
2 the Department did not hold an evidentiary hearing for purposes of determining the number of  
3 irrigation users of groundwater in the sub-basin. The applicable statutes are clear with respect to  
4 when a hearing must be held in connection with a decision to designate an INA. A.R.S. § 45-435(A)  
5 provides that the Director shall hold a public hearing *if* the Director finds that a petition has been  
6 filed pursuant to A.R.S. § 45-433. None of the statutes governing the process for designating a  
7 subsequent INA require a hearing to be held to determine whether a petition has been filed pursuant  
8 to A.R.S. § 45-433.

9           6.       Some commenters object to the Department's calculation of the number of  
10 petitioners, arguing that the majority of petitioners are business entities that are closely related to  
11 one another and/or that share many of the same members and managers and therefore should not  
12 be treated as entities distinct from one another. Some commenters relatedly argue that A.R.S. § 45-  
13 433(A)(1) should not be interpreted to permit entities to organize new entities solely for purposes  
14 of meeting the signatory requirements of that statute.

15           7.       In connection with its analysis of the Petition, the Department reviewed publicly  
16 available business entity filings to confirm that all petitioners are legal entities separate and apart  
17 from one another. No evidence was provided to the Department that any of the petitioning entities  
18 are "sham" entities or were created solely for the purpose of satisfying the requirements of A.R.S.  
19 § 45-433(A)(1).

20           8.       One commenter contends that the signatories to the Petition failed to establish that  
21 they were authorized to sign on behalf of the entities for which they signed and that the signatures  
22 were not verified by an affidavit of circulator. The Department reviewed publicly available business  
23 entity filings and requested from petitioners additional certificates of resolution and internal  
24 business entity governance documents as necessary in order to confirm each signatory's  
25 authorization to sign on behalf of his respective entity. In one case, where the authorization of an  
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1 individual to sign on behalf of an entity was questioned by the Department, a clearly authorized  
2 signature was provided. In the course of undertaking its analysis, the Department communicated  
3 directly with signatories, and no claim of forgery or invalidity was made. The Department has  
4 received no evidence that the signatures on behalf of the 16 petitioning entities are in any way  
5 invalid.

6 9. On July 17, 2015, the Department received 15 declarations on behalf of 14  
7 individuals/entities alleging that they were improperly excluded from the Department's calculation  
8 of non-petitioning irrigation users of groundwater for purposes of its Petition analysis. The  
9 Department could not determine from these declarations that these claimants should in fact be  
10 considered irrigation users of groundwater. The Department was not provided with and could not  
11 locate parcels within the sub-basin associated with some of these claimants. Where parcel  
12 information was provided or where the Department could match claimants with parcels using  
13 Cochise County Assessor records, the Department's review of satellite and other aerial imagery  
14 reflected no signs of irrigation during the relevant 5-year period. It appears that in at least two  
15 instances, two claimants allege to be irrigation users with respect to the same parcel.

16 10. The Department was additionally contacted by four individuals alleging that they  
17 were improperly excluded from the Department's calculation of non-petitioning irrigation users of  
18 groundwater. The Department requested information from these individuals in order to assess their  
19 claims. Two of these individuals, after obtaining clarification on the definition of "irrigation user  
20 of groundwater" did not provide additional information and did not otherwise pursue their claims.  
21 Two individuals provided additional information but did not submit sufficient evidence to  
22 demonstrate that they had irrigated two or more acres within the sub-basin during the 5-year period  
23 between March 6, 2010 and March 6, 2015.

24 11. Finally, four additional individuals/entities were alleged by others to be irrigation  
25 users of groundwater but did not make a claim on their own behalves. The Department was not  
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1 provided parcel information with respect to three of individuals/entities. The Department asked  
2 claimants to provide additional information regarding these three individual/entities; however, no  
3 additional information was provided. With respect to the fourth alleged irrigation user of  
4 groundwater, no evidence was provided to the Department that the alleged irrigator had applied  
5 water to two or more acres in the sub-basin at any time.

6 12. The Director determines that the individuals/entities discussed in Findings No. 9-11  
7 above should not be considered irrigation users of groundwater for purposes of A.R.S. § 45-  
8 433(A)(1).

9 B. There is sufficient groundwater to provide a reasonably safe supply for irrigation of the  
10 cultivated lands in the San Simon Valley Sub-basin at current rates of withdrawal.

11 13. After the Department's own independent investigation into the available supply of  
12 groundwater in the sub-basin, and after giving full consideration to public comment in accordance  
13 with A.R.S. § 45-435(C), the Director finds that there is sufficient groundwater to provide a  
14 reasonably safe supply for irrigation of the cultivated lands in the area of the proposed INA at  
15 current rates of withdrawal.

16 14. The San Simon Valley Sub-basin is an intermontane valley of approximately 1,930  
17 square miles in portions of Graham and Cochise Counties in Arizona and extending into a portion  
18 of southwest New Mexico.

19 15. The main source of groundwater in the valley is from precipitation in mountainous  
20 areas surrounding the valley. The precipitation recharges the sub-basin's basin-fill aquifer along  
21 the mountain fronts and ephemeral streams that flow from the mountains.

22 16. The estimated thickness of the aquifer varies throughout the sub-basin. South and  
23 west of Bowie, bedrock is relatively shallow, but aquifer thickness reaches more than 6,000 feet  
24 east of Bowie, and 8,000 feet in an area south of the town of San Simon.  
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1           17.     Throughout a significant part of the sub-basin, clay units which are up to several  
2 hundred feet in thickness separate the aquifer into a lower and an upper system. The upper system  
3 is relatively shallow, not exceeding 400 feet below land surface in most areas.

4           18.     Agricultural uses grew significantly in the San Simon Valley Sub-basin between the  
5 early 1950s to the early 1980s, with estimated agricultural pumping peaking at nearly 140,000 acre-  
6 feet per year in 1980.

7           19.     However, by 1983, agricultural pumping declined and has remained relatively  
8 constant at between 45,000 to 50,000 acre-feet per year for the last several decades. Several  
9 commenters noted that this decline in pumping was precipitated by the termination of certain  
10 governmental subsidies benefitting cotton growers and not due to concerns about the availability of  
11 groundwater in the sub-basin.

12          20.     The United States Geologic Survey (“USGS”) estimates that approximately 20,000  
13 acres were being irrigated in the San Simon Valley Sub-basin in 2014, using approximately 45,000  
14 acre-feet of water for that year.

15          21.     The vast majority of groundwater withdrawn for agriculture is from wells which  
16 extend into the aquifer’s lower system.

17          22.     Primarily due to incidental recharge, the upper aquifer system is subject to  
18 fluctuations in water levels and may experience increased water levels even as groundwater  
19 pumping increases throughout the sub-basin and as groundwater levels in the lower system decline.

20          23.     Agricultural pumping is largely concentrated in four geographic areas within the  
21 sub-basin: the area surrounding Bowie and extending to the settlement of Olga; the area surrounding  
22 San Simon; an area northeast of Portal; and the area near Rodeo.

23          24.     Within these major areas of agricultural pumping, current aquifer saturated thickness  
24 levels in the lower system range from 800 feet to several thousand feet.

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1           25.     Within the major areas of agricultural pumping, current depth to water levels are at  
2 an average of 257 feet below land surface and are not greater than approximately 560 feet below  
3 land surface in the lower system.

4           26.     The average decline rate of all of the wells in the sub-basin that had depth to water  
5 measurements taken by the Department in both 2007 and 2015 and which demonstrated water level  
6 declines was only 1.7 feet per year for the time-period between 2007 and 2015.

7           27.     With respect to determining whether the sub-basin has “insufficient groundwater to  
8 provide a reasonably safe supply for irrigation of the cultivated lands,” the statute makes clear that  
9 the Director is to consider *current* rates of withdrawal. A.R.S. § 45-432(A)(1). Therefore, the  
10 Director has given consideration to current rates of withdrawal as calculated using crop surveys and  
11 water use data from the USGS.

12           28.     Some proponents of an INA express a concern that, particularly in light of drought  
13 and water shortage conditions in California, farmers from that state are likely to purchase land in  
14 the San Simon Valley Sub-basin and begin irrigating a large number of new acres. Relatedly, at  
15 least two commenters state that a large number of acres are currently in the process of being  
16 developed for irrigation within the sub-basin. At least one commenter argues that the Department’s  
17 model projections should consider the impacts of projected future withdrawals based on this new  
18 development.

19           29.     In view of the plain language of A.R.S. § 45-432(A)(1), the Director must consider  
20 only current rates of withdrawal and may not speculate about or try to predict how rates of  
21 withdrawal will change in the future.

22           30.     Some commenters note that a significant number of acres in the sub-basin are newly  
23 cropped with young pecan and pistachio trees and that these will require increasingly greater  
24 amounts of water as they mature. These commenters argue that the Department’s model projections  
25 should consider projected increased water demand for these crops, because A.R.S. § 45-432(A)  
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1 requires consideration of available groundwater supplies with regard to “the cultivated lands” in  
2 the sub-basin. One commenter noted that “[f]or orchards, the cultivated lands remain constant and  
3 the demand increases beyond ‘the current rates of withdrawal’.”

4         31. The commenters discussed in Finding No. 30 above would have the Director apply  
5 only the portion of A.R.S. § 45-432(A)(1) that states “there is insufficient groundwater to provide  
6 a reasonably safe supply of groundwater for irrigation of the cultivated lands in the area.” The  
7 legislature, however, chose to add the additional limiting language “at the current rates of  
8 withdrawal.” The Director may not disregard this limiting language or interpret it to be mere  
9 surplusage. *See Simpson v. Simpson*, 224 Ariz. 224, 225 (App. 2010) (stating that statutes should  
10 not be read “so as to render any of its language mere surplusage, and instead give meaning to each  
11 word, phrase, clause, and sentence so that no part of the statute will be void, inert, redundant, or  
12 trivial”) (internal citation and quotations omitted).

13         32. The Department’s groundwater model was used to project groundwater conditions  
14 after 100 years of pumping at current rates of withdrawal. Although the applicable statutes do not  
15 require the Department to make projections this far into the future, the Department’s model projects  
16 that sufficient volumes of groundwater will exist in storage in the aquifer for irrigation use at the  
17 end of the 100-year period based on current rates of withdrawal.

18         33. Largely because the upper system is relatively thin, the Department’s groundwater  
19 model predicts dewatering in portions of the upper system during 100 years of agricultural pumping  
20 at current rates.

21         34. However, the Department is not aware of a significant impediment that would  
22 prevent the extension of shallow wells into the lower system in the event of dewatering in the upper  
23 system.

24         35. Assuming that groundwater continues to be withdrawn at the current rates, the  
25 Department’s groundwater model projects that after 100 years, the average depth to water in the  
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1 lower system will be approximately 352 feet below land surface, and the depth to water in the lower  
2 system will not exceed 700 feet below land surface in the major areas of current agricultural  
3 pumping.

4 36. Assuming that groundwater continues to be withdrawn at the current rates, the  
5 Department's model projects that after 100 years, saturated thickness in the lower system will not  
6 be less than 400 feet in any major area of current agricultural pumping.

7 37. The groundwater model's projections for depth to water and saturated thickness  
8 levels described above indicate that, if pumping continues at current rates of withdrawal, a  
9 significant supply of groundwater will be accessible for irrigation purposes in the sub-basin for at  
10 least 100 years.

11 38. One commenter submitted a report prepared by Leonard Rice Engineers, Inc. titled  
12 "Evaluation of the San Simon Sub-basin as an Irrigation Non-Expansion Area" ("Leonard Rice  
13 Report"). The Leonard Rice Report projects that, in 2115, the average depth to water in the major  
14 irrigation pumping centers in the sub-basin will be 430 feet below land surface in the lower system  
15 and asserts that irrigation within the sub-basin will become uneconomical in 50 to 60 years when  
16 the report predicts that depth to water levels in the sub-basin will reach an average depth of 370  
17 feet below land surface in the lower system. *See* Leonard Rice Report, page 22.

18 39. The conclusions of the Leonard Rice Report are inapposite for at least two reasons:

19 (1) The Leonard Rice Report considers the availability of groundwater in light  
20 of projected future withdrawal rates, rather than current withdrawal rates, contrary to the  
21 dictates of the applicable statute. The Leonard Rice Report uses the Department's model to  
22 project depth to water level in the sub-basin based upon a withdrawal rate of 66,500 acre-feet  
23 per year. The report states that the Department's model results for 2115 show an average depth  
24 to water of about 350 feet below land surface in the irrigation pumping centers compared to 430  
25 feet for [the Leonard Rice Report's] analysis. The Leonard Rice Report acknowledges, "The  
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1 difference occurs because [the Department] did not include the full future irrigation demands  
2 for lands currently irrigated....” As stated above at Findings No. 29 and 31, the Department is  
3 required, under the plain language of the statute, to consider only current rates of withdrawal  
4 and may not consider “full future irrigation demands.”

5 (2) To the extent that arguments related to the economic feasibility of pumping  
6 at a particular depth to water are relevant to the Director’s decision to designate an area as a  
7 subsequent INA, the report fails to establish that an average depth-to-water measurement of 370  
8 feet below land surface would in fact render irrigation of the cultivated lands in the sub-basin  
9 economically infeasible. As noted in the report at page 18, each farm in the Sub-basin has “a  
10 unique profit and cost situation” which is impacted by several factors. Many of these factors,  
11 such as the value (or demand for) the crop in question and fuel costs, will vary from year to  
12 year. In light of this, the Director questions the assumption of the report that “farm income and  
13 expenses ... are nearly a constant percentage year to year.” This seems a particularly  
14 questionable assumption when attempting to make projections over a span of many years.  
15 Additionally, the reliability of the report’s estimates of profit margin are questionable. The  
16 Leonard Rice Report states at page 18, that it relied upon University of Arizona Extension  
17 Service Crop Budgets for Pinal and Cochise Counties in making its economic feasibility  
18 projections. However, is not clear that the report considered the profitability of orchards, which  
19 the report acknowledges make up more than 60% of the irrigated crops in the sub-basin. The  
20 sample crop budgets provided in Leonard Rice Report are for corn and alfalfa only, which,  
21 combined, make up only approximately one-fourth of the cropped acreage in the sub-basin. In  
22 addition, the Department is aware that pumping for agricultural purposes is occurring or has  
23 occurred at depths to water greater than 400 feet below land surface in other parts of the state.

24 40. To the extent that arguments related to the economic feasibility of pumping at a  
25 particular depth to water are relevant to the Director’s decision to designate an area as a subsequent  
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1 INA, the Department has not been presented with sufficient evidence to support the designation of  
2 the San Simon Valley Sub-basin as a subsequent INA on this ground.

3 41. In light of relatively small average decline rates within the sub-basin in combination  
4 with model projection that after 100 years of pumping at *current* rates of withdrawal, in the major  
5 areas of agricultural pumping: (1) the average depth to water would be approximately 350 feet  
6 below land surface and that depth to water would not exceed 700 feet below land surface; and (2)  
7 that saturated thickness in the lower system would not be less than 400 feet, the Director finds that  
8 there is sufficient groundwater to provide a reasonably safe supply for irrigation of the cultivated  
9 lands in the area at the current rates of withdrawal. Therefore, an INA should not be designated in  
10 the San Simon Valley Sub-basin.

11 C. Establishment of an AMA in the San Simon Valley Sub-basin is not necessary.

12 42. The establishment of an AMA pursuant to A.R.S. § 45-412 is not necessary.

13 43. In light of the Department's determinations in its Findings Nos. 13-41 above, there  
14 is no evidence that active management practices are necessary to preserve the existing supply of  
15 groundwater for future needs.

16 44. While there is evidence of land subsidence and fissuring in the sub-basin, the  
17 Department has received no evidence that land subsidence or fissuring is endangering property or  
18 the potential groundwater storage capacity of the sub-basin to any significant degree.

19 45. Water quality data from a 2004 Arizona Department of Environmental Quality study  
20 indicates that about 86% of all wells studied met all health-based water quality standards. Those  
21 wells that did not meet those standards were clustered in an area near the town of San Simon where  
22 it appears that groundwater is often unsuitable for domestic and/or municipal uses without  
23 additional water treatment, but is generally suitable for irrigation.  
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(c) The Department shall provide written notice of the date that the Director's Decision becomes final to all persons who attended the May 16, 2015 public hearing, to all persons who submitted written comments on the proposed INA, and to all landowners within the San Simon Valley Sub-basin of county record. In addition, the Department shall post notice of the date that the Director's Decision becomes final on the Department's website for at least sixty days after the Decision becomes final.

GIVEN under my hand this 12 day of August, 2015.

  
Thomas Buschatzke  
Director

# **EXHIBIT A**

## ADWR's Analysis of Validity of Petition

On February 6, 2015, the Arizona Department of Water Resources (the Department) received a "Petition for Designation of Irrigation Non-Expansion Area in the San Simon Valley Sub-basin," accompanied by lists of Cochise County assessor parcel numbers and maps of irrigated lands for petitioning entities. The Department received supplemental petition forms on March 4, 2015, March 6, 2015, and March 9, 2015. The February and March petition forms are referred to collectively as "the Petition." The Petition and the accompanying maps and assessor information provided by the petitioners are available in the links above.

Arizona Revised Statute **(A.R.S.) § 45-433 (A)(1)** provides that the designation of a subsequent irrigation non-expansion area ("INA") may be initiated by petition to the director signed by "[n]ot less than ... one-fourth of the irrigation users of groundwater within the boundaries of the groundwater basin or sub-basin specified in the petition."

The Department has determined that there are a total of 52 "irrigation users of groundwater" within the San Simon Valley Sub-basin for purposes of **A.R.S. § 45-433(A)(1)**<sup>1</sup>. Of those, 16 individuals/entities (or 31% of the total) validly petitioned for the designation of an INA encompassing the San Simon Valley Sub-basin, as shown in the table below.

<b>Irrigation Users of Groundwater</b>	
<b>Petitioners:</b>	
MASSEY FARMS, INC. / MASSEY ENTERPRISES, LLC	H & R FARMS, LLC
BRIAN AND GERILENE DRISCOLL	SAN SIMON ESTATE LAND COMPANY, LLC
J & P PISTACHIO, LLC	PISTA LAND COMPANY, LLC
WPD PISTACHIO, LLC	CHAPMAN FARMS, LLC
R & R ORCHARDS, LLC	FORT BOWIE RANCHES, LLC
WHITETAIL CREEK ORCHARD, LLC	FARMERS INVESTMENT COMPANY
A & P RANCH, LP	S & H FARMS, LLC
HFT PECAN ORCHARD, LLC	FOUR STAR PISTACHIO, LLC
<b>Non-Petitioners:</b>	
2224 EAST PINCHOT LLC	<del>MASSEY BILLY FRED REV TRUST</del>
ALMQUIST FAMILY TRUST	MICHAELS MARK DANIEL
ALMQUIST JOHN A JR & LAURA T TRUST	OCEAN VIEW FARMING LLC
BARNARD JASON N & CANDICE R LIVING TRUST	OWENS HARRY
BENJAMIN FARMS LLC	OWENS HARRY V JR
BIAD CHILE SAN SIMON LLC	PARKER RANCH LLC
<del>BILLEY MASSEY ET AL (State Land Ag Lease)</del>	<del>PATTERN FARMS LLC</del>
COPPER HORSE VINEYARD LLC	PATZMAN JOHN F & RUTH
EAST FLANK VINEYARDS LLC	PIERCE JEANETTE REV LIV TR
EASTMAN J DICK & CODY REV TR AGREEMENT	POWER RONALD G & KAREN C (2)
FIDELITY NATL TITLE AGY INC TR#10829	POWER RONALD G JR & TRESCIA L (2)
FIDELITY NATL TITLE AGY INC TR#10914	RIVERS EDWARD E
FINA CHARLES P	RIVERS LARRY D TRUST OF
FIRST PECAN CO	RYDER RANCH COMPANY LLC
KEIL DANIEL L & LENA M	TURLEY CHARITABLE REMAINDER TRUST

LESCO ENTERPRISES INC	TURLEY MARSHALL & ELLEN
MAHAN LS	WEBSTER RANDALL TODD & LESTI LEA
<b>Additional Non-Petitioners:</b>	
FESTUS KHAN	CORDOVA ACRES (MIKE LOWE)
URS ORCHARDS, LLC	HNDEZ FARM, LLC

<sup>1</sup> The determination that the individuals/entities listed are "irrigation users of groundwater" is strictly for the purpose of determining whether the Petition meets the requirements of A.R.S. § 45-433(A). Should the San Simon Valley Sub-basin be designated an INA, inclusion on this list is not a guarantee of the amount of acres for which a party will be issued an Irrigation Authority.

<sup>2</sup> The Department recognizes that for some parcels, the landowner may not be the "irrigation user of groundwater," such as where irrigation is carried out by virtue of an operating lease. However, this table lists the landowners of irrigated parcels to represent the "irrigation user of groundwater" associated with each respective parcel.

Because not less than one-fourth of the irrigation users of groundwater within the San Simon Valley Sub-basin have petitioned for the designation of an irrigation non-expansion area, the Department is holding a public hearing as set forth in **A.R.S. § 45-435**. The Department is providing the following description of its analysis of the Petition to assist the public in understanding its determination that the Petition meets the requirements of A.R.S. § 45-433(A)(1).

## **I. Analysis of the Number of Irrigation Users of Groundwater**

In order to determine the total number of irrigation users of groundwater in the San Simon Valley Sub-basin, the Department utilized United States Geological Survey (USGS) Landsat satellite imagery, Cochise County Assessor information (both ownership data and parcel boundaries), Arizona State Land Department agricultural lease information available on-line, imagery available on Google Earth™, and internet searches. For purposes of this analysis, the Department sought to identify individuals/entities who had irrigated within the sub-basin within the five-year period preceding the date of the receipt of the Petition. "Irrigate" is defined at **A.R.S. § 45-402(18)** to mean "to apply water to two or more acres of land to produce plants or parts of plants for sale or human consumption, or for use as feed for livestock, range livestock, or poultry, as such terms are defined in section 3-1201." For purposes of this analysis, the Petition is considered by the Department to have been received in full on March 6, 2015, when the Department received a supplemental petition form providing an authorized signature for Chapman Farms, LLC, as described in Part II below.

Landsat satellite imagery (Path 35, Rows 37 and 38) was acquired on-line from the USGS website for the following dates: 7/11/2009; 6/12/2010, 7/6/2010 and 8/15/2010; 6/15/2011; 6/9/2012; 5/19/2013 and 6/4/2013; 6/7/2014; and 2/2/2015. February 2, 2015 was selected as it is the date closest to the date of the submittal of the Petition for which Landsat imagery of the San Simon Valley Sub-basin was available. The other dates were selected during the peak irrigation demand season so that irrigated lands could be more readily distinguished from non-irrigated lands. Landsat images have a 30-meter resolution, so irrigated fields two or more acres in size can readily be discerned.

Prior to the Department's analysis, the Landsat images were processed by the Department's Geographic Information System (GIS) staff who selected spectral bands 1, 2, 3, 4, 5 and 7 for Landsat 5 and 7 images to emphasize vegetation in the images. Spectral bands 2, 3, 4, 5, 6 and 7 were used for Landsat 8 images for the same purpose. The images were processed in ERDAS Imagine 2014 so that they could be displayed as layers within the Department's GIS computer program (ESRI ArcGIS 10.2). For each year of the analysis, the satellite imagery was overlaid

with the shapes of Cochise County assessor parcels (acquired from Cochise County on February 10, 2015). Department analysts then selected each parcel that appeared to be irrigated and the Cochise County Assessor ownership information (as provided by Cochise County on February 25, 2015) for that parcel was automatically placed in a data table.

For parcels whose irrigation status remained uncertain after review of Landsat imagery, the Department studied imagery available on Google Earth™ from May 20, 2011 and/or December 6, 2013. Google Earth™ was also used to search for irrigation uses, such as vineyards, which may not provide a signal readily visible in Landsat imagery because of the spacing of the vines. USGS crop survey information from October 2014, which mapped a category described as "young pecans", was also used to verify the irrigation status of some parcels. Orchards of young pecans may not be readily visible in Landsat imagery because of the spacing between trees.

Google™ was used to search data available via the internet for vineyards located within the San Simon Valley Sub-basin. When vineyards two or more acres in size were identified, their ownership information was added to the data table.

The Landsat imagery analysis described above was completed by two independent Department analysts. In addition, the Department used ERDAS Imagine software to perform an automatic classification to identify irrigated parcels two or more acres in size on each of the images based on the spectral signature of the agriculture. The parcels selected by the classification analysis were then cross-checked by Department staff and added to the data table, when appropriate.

The Arizona State Land Department (ASLD) website was used to locate agricultural leases within the San Simon Valley Sub-basin. The Landsat imagery analysis described above was then used to determine which of the leases had been irrigated during the five years preceding the receipt of the Petition. The list of lease numbers was e-mailed to ASLD, and ASLD returned a list of the lessees of those identified leases. That list can be viewed on our website at: <http://www.azwater.gov/azdwr/documents/StateLandInformation.pdf>.

The Department then evaluated the data table of "irrigation users of groundwater" produced during the Landsat imagery analysis to determine whether each of the petitioners had irrigated at least one parcel of two or more acres during the five years preceding the receipt of the Petition. The Department verified that 16 petitioning individuals/entities listed in the table above qualified as "irrigation users of groundwater". Several petitioners also irrigated ASLD leased agricultural land. Where the same entity irrigated both privately-owned land and state-owned land, the entity was counted as a single "irrigation user of groundwater".

The data table of "irrigation users of groundwater" was then sorted by landowner, as identified by Cochise County Assessor records, so that a list of landowners who had irrigated at least one parcel of two or more acres during the five years preceding the receipt of the Petition could be compiled. The Department determined that there were a total of 33 non-petitioning landowners on this list. The list of 33 landowners was then compared to the list of ASLD agricultural lessees where irrigation had occurred in the last five years to determine whether there were any lessees with unique names not found on the list of 33 landowners. One such lessee was initially identified, but subsequently removed from the list after the Department received documentation demonstrating that the agricultural lease was being irrigated by a previously identified entity also irrigating privately-owned land. In addition, the parcel owners of the property identified as "MASSEY BILLY FRED REV TRUST" provided documentation that the property is being farmed by Massey Farms, Inc. and should not be identified as a separate "irrigation user of groundwater". The Department has removed "MASSEY BILLY FRED REV TRUST" from the list of non-petitioning landowners.

The Department purchased detailed imagery of the irrigated portions of the San Simon Valley sub-basin that was acquired by satellite on March 13 and 14, 2015. The Department is utilizing this imagery, as well as input from the public, to determine if additional "irrigation users of

groundwater” should be added to the list of non-petitioners. The Department has determined that the individuals/entities shown under “Additional Non-Petitioners” in the table above should be considered as “irrigation users of groundwater.”

## **II. Analysis of Authorization of Signatories**

The Department undertook to determine whether those individuals who signed the Petition on behalf of separate entities were authorized to do so. In connection with its analysis, the Department reviewed information which is publicly available through the Arizona Corporation Commission’s website as well as Certificates of Resolution and other corporate governance documents submitted by the petitioners. Based on this information, the Department determined that it required the signature of Jared Allred on behalf of Chapman Farms, LLC (Chapman Farms). Chapman Farms submitted the signature of Jared Allred by petition form received on March 6, 2015. The Department was also advised by the President of Bowie Pecans, Inc., (Bowie Pecans) that Bowie Pecans no longer irrigates within the relevant sub-basin. Therefore, Bowie Pecans has not been included as an irrigation user of groundwater for purposes of making the calculation of A.R.S. § 45-433(A)(1). Finally, a map which accompanied the petition form received on February 6, 2015, included as part of the petitioner’s lands a parcel owned by S & H Farms, LLC, an entity not listed on the petition form received February 6, 2015. The Department was advised that an individual authorized to sign on behalf of S & H Farms, LLC, intended but inadvertently failed to list the entity as a petitioner. S & H Farms, LLC, submitted a supplemental petition form which was received by the Department on March 4, 2015.

After its review, the Department determined that the 16 individuals/entities listed in the table above validly petitioned for the designation of an INA within the San Simon Valley Sub-basin.