



Agricultural Water Offset Program



Background

County Planning Department contacted the RCD to design a water use offset program for agriculture users in Paso Basin.

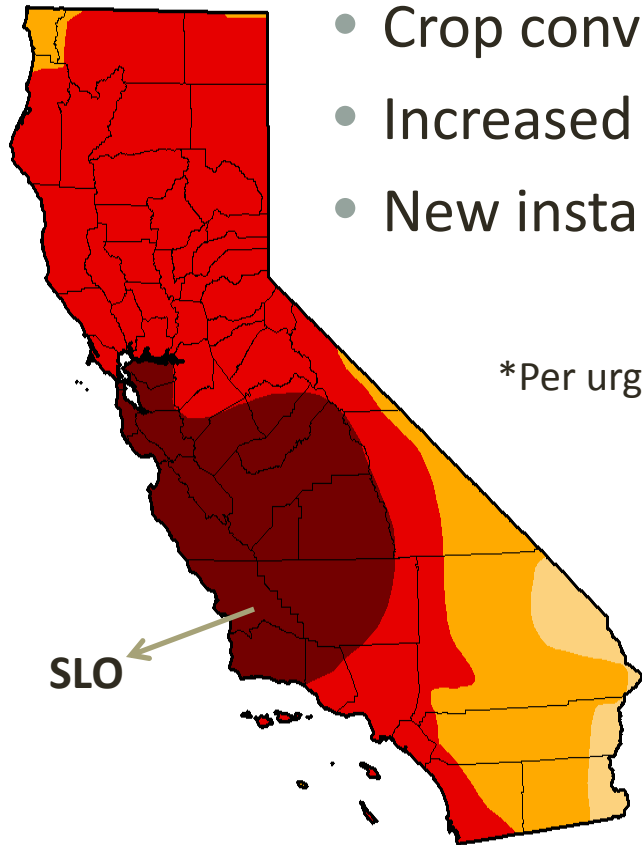
- *developed in response to the urgency ordinance which requires **NEW** irrigated Ag to offset their total projected water use.*

More Background

1. Most Basic Reason for ordinance: **Severe Decline**

2. What is considered “new irrigated Ag?” *

- Crop conversions
- Increased crop density
- New installations on previously un-irrigated lands



*Per urgency ordinance language

Phase I – Technical Analysis



- **RCD assembled a multidisciplinary project team (March)**
 - Hydrogeologist
 - Hydrologic engineer
 - UC Cooperative Extension staff
 - Cal Poly ITRC department faculty
 - NRCS Conservationist
 - GIS specialist
 - Agricultural manager
 - Biological Expertise
- **Analysis** of potential for offset credits within regional areas
- **GIS mapping** and verification of crop layer data
- Data and methodology **review of water use by crop type**
 - **Master Water Report**
 - UC Extension input

Phase II – Public Outreach



- RCD collaborating with YOU!
 - Paso Robles Wine Alliance
 - Ag Liaison Committee
 - Farm Bureau
 - Cattlemans Association
 - Vineyard Team
 - Olive Growers Association
 - Pro Water Equity
 - Other Stakeholder Groups TBD
- Town Hall meetings (Later Phase)
 - Open to the public for general discussion and questions

Draft program Standards

- Framework Provisions
 - Crop Conversions
 - New irrigated acreage
 - Increased crop density
 - Rootstock conversions (still under analysis)
 - Rural GW uses not included in urban domestic program thru County

Flow of Program

Determine amount of Water Credit
(current crop acreage x water use factor)

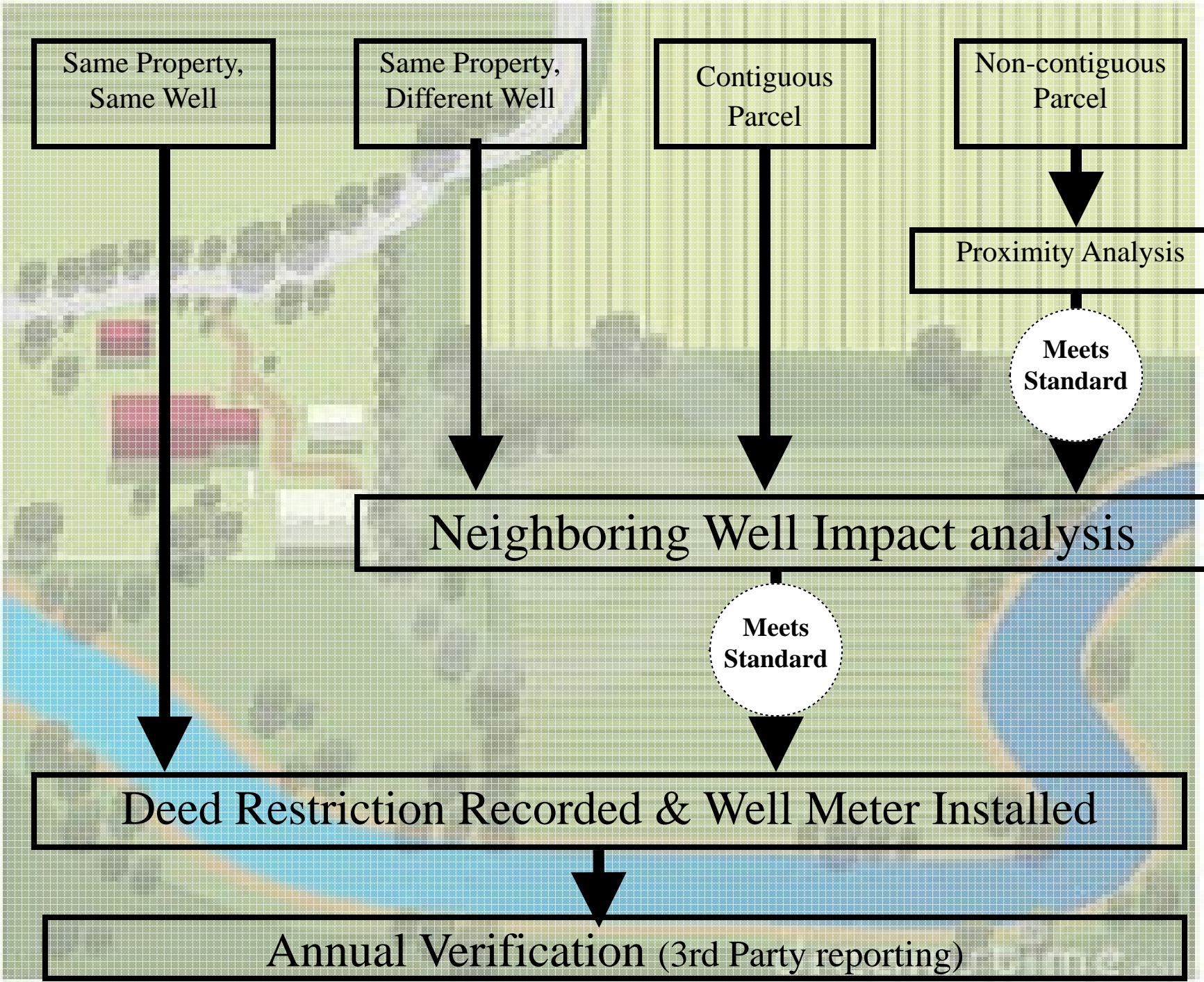
Determine Potential Acres of New Crop
(water credit amount / water use factor)

Same
Property,
Same Well

Same
Property,
Different
Well

Contiguous
Parcel

Non-
contiguous
Parcel



Master Water Report

<http://www.slocountywater.org>

San Luis Obispo County
Master Water Report
Volume II of III MAY 2012

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Crop Water Calculations

Annual Crop Specific Applied Water

$$(AF/Ac/Yr) = \frac{ET_c - ER}{(1 - LR) \times IE} + FP$$

where:

ET_c = crop evapotranspiration = $ET_o \times K_c$

ET_o = reference evapotranspiration

K_c = crop coefficient

ER = effective rainfall

FP = frost protection

LR = leaching requirement

IE = irrigation efficiency

Crop Groups MWR/Offsets

Table 1. Crop Group and Commodities Used for the Agricultural Demand Analysis

Crop Group	Primary Commodities
Alfalfa	Alfalfa
Nursery	Christmas trees, miscellaneous nursery plants, flowers
Pasture	Miscellaneous grasses, mixed pastures, sod/turf, sudangrass
Small Grains	Oats, barley, wheat
Citrus	Avocados, grapefruits, lemons, oranges, olives, kiwis, pomegranates (nondeciduous)
Deciduous	Apples, apricots, berries, peaches, nectarines, plums, figs, pistachios, persimmons, pears, quinces, strawberries
Strawberries	Strawberries
Vegetables	Artichokes, beans, miscellaneous vegetables, mushrooms, onions, peas, peppers, tomatoes
Vineyard	Wine grapes, table grapes

Crop Water Average #'s

Table 2. Existing Crop-Specific Applied Water (AF/Ac/Yr) by Crop for the Salinas/Estrella WPA

Crop Group	Applied Water (AF/Ac/Yr)
Alfalfa	4.5
Citrus	2.3
Deciduous	3.5
Strawberries	2.3*
Nursery	2.5
Pasture	4.8
Small Grain	1.7*
Vegetables	1.9
Vineyard	1.7

*Information obtained from Current Cost and Return Studies, UCCE, UC Davis (Small grains 2013 data, Strawberries 2011 data)

Flow of Program

Determine amount of Water Credit
(current crop acreage x water use factor)

Determine Potential Acres of New Crop
(water credit amount / water use factor)

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Ag Water Conservation Offset Program

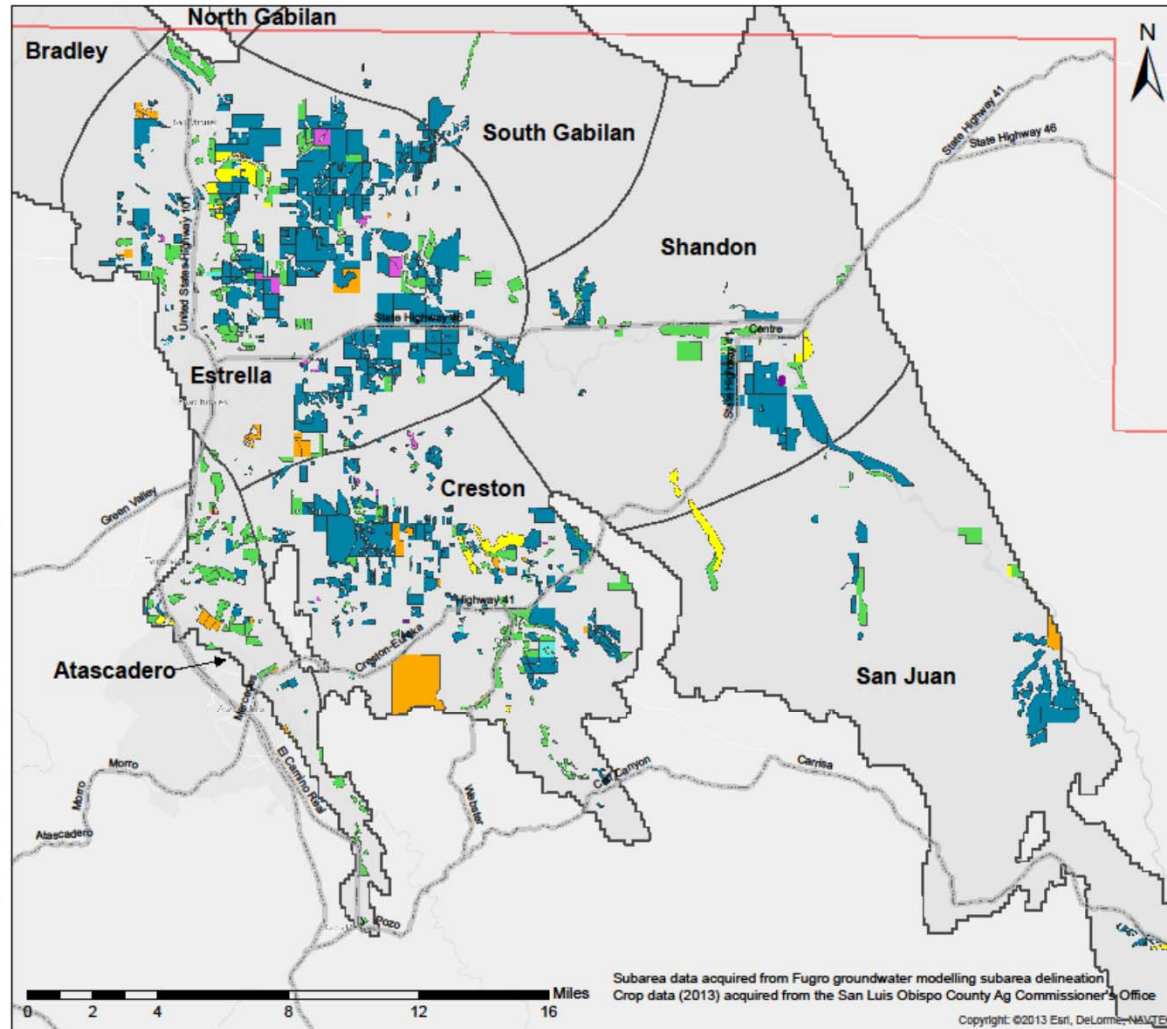
Paso Robles Groundwater Basin

Irrigated Crops by Sub Area

Category

- Vineyard = 31277 Acres
- Vegetables = 9453 Acres
- Deciduous = 665 Acres
- Nursery = 77 Acres
- Citrus = 405 Acres
- Pasture = 1355 Acres
- Alfalfa = 1837 Acres
- SLO County Boundary
- PRGWB Sub Areas

San Luis Obispo County



Disclaimer: GIS data are to be considered a generalized spatial representation that is subject to revisions. This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. The US-LTRCD, US-MCRCD, GVC, or GSI assume no responsibility associated with its misuse.



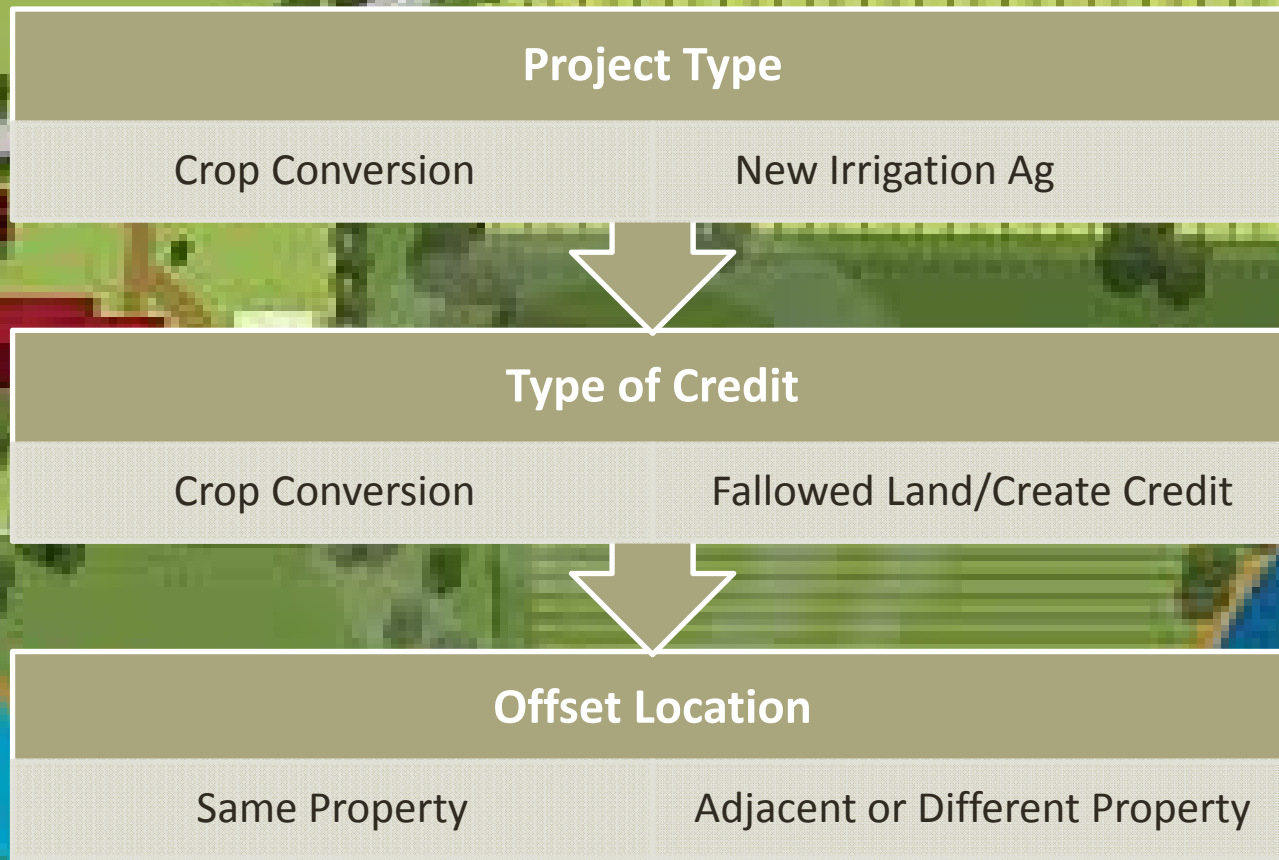
Crop Water Savings Analysis

Crop conversions for higher water use crops such as Alfalfa *could yield* potential new irrigated acreage for lower water use crops as follows.

Sub Area	Convert Alfalfa Acreage to					
	Citrus	Deciduous	Nursery	Pasture	Vegetables	Vineyard
Estrella	531	271	489	204	643	582
Creston	0	0	0	0	0	0
Shandon	601	307	553	230	727	658
Atascadero	0	0	0	0	0	0
San Juan	650	332	598	249	786	711
South Gabilan	0	0	0	0	0	0
Total potential acreage conversions	1782	910	1640	683	2156	1951

*basin sub-area boundaries used for analysis purposes

Process Overview



Steps, Simplified

Step 1 – Determine Water Use

Determine water credit for existing crop

Step 2 – Determine New Crop Acreage

Determine acreage and water use for the new crop

Step 3 – Assess Impacts to Wells

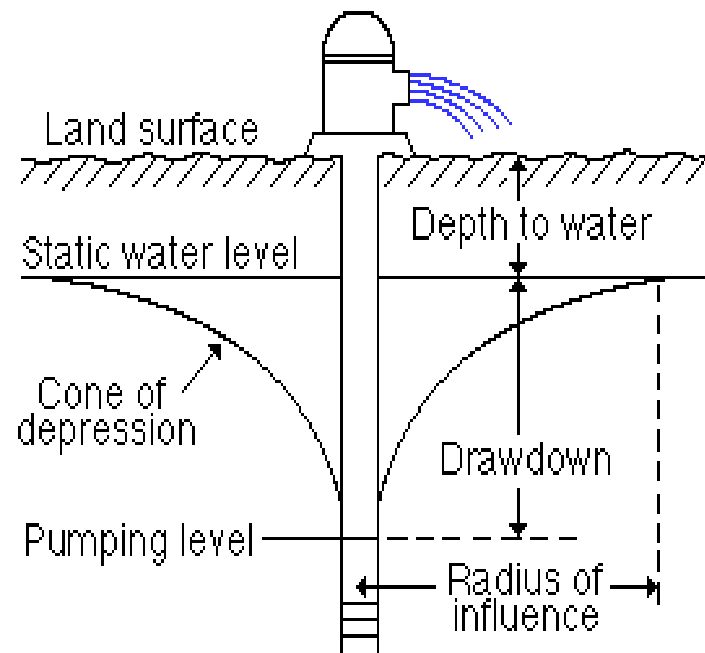
Evaluate drawdown impacts on neighboring irrigation and domestic wells

Step 4 – Check Proximity

Determine that credit well location is within cone of depression of new well location

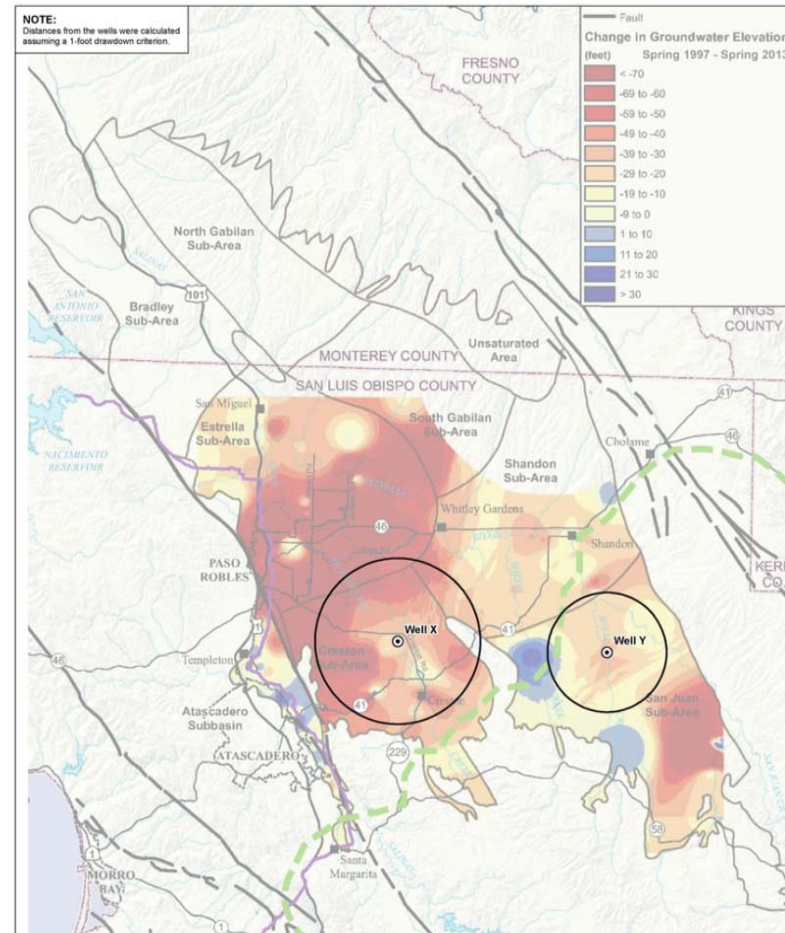
Well Pumping: Proximity of Credit

- Must define acceptable distance where credit will likely offset the impact
- Analysis of impacts to neighboring wells
- Tiered Approach – heightened standards for offset credits located at greater distances (Category 2-4)
- Must be similar water bearing zone and depth



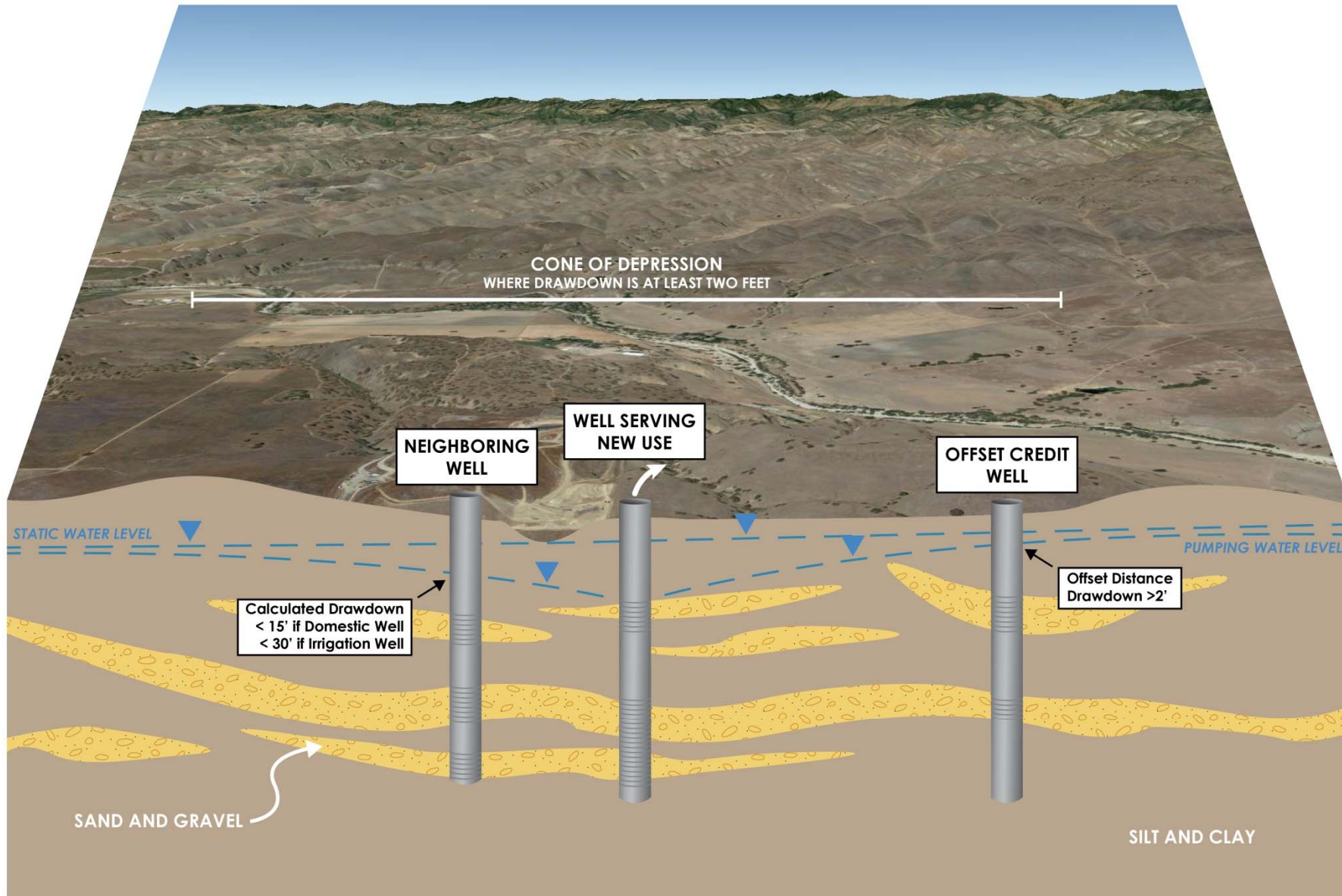
Category 4 Applications

1. Cone of Depression model
 - a. Based on well drawdown, hydrogeology, and transmissivity characteristics
 - b. Well providing credit must be within the cone of depression of well serving the new use (category 4), where there is at least 2 feet of drawdown
 - c. Simple to use calculators have been developed



Proximity Analysis Example

Paso Robles Basin



■ Silt and Clay ■ Sand and Gravel

Image from Google Earth Pro

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Neighboring Well Criteria

Increased pumping cannot significantly impact neighboring irrigation and domestic wells

- ✓ *Domestic wells – 15 feet additional drawdown*
- ✓ *Irrigation wells – 30 feet additional drawdown*

Applicant must identify wells within one mile

Simple calculator is used to compute water level drawdown at various distances

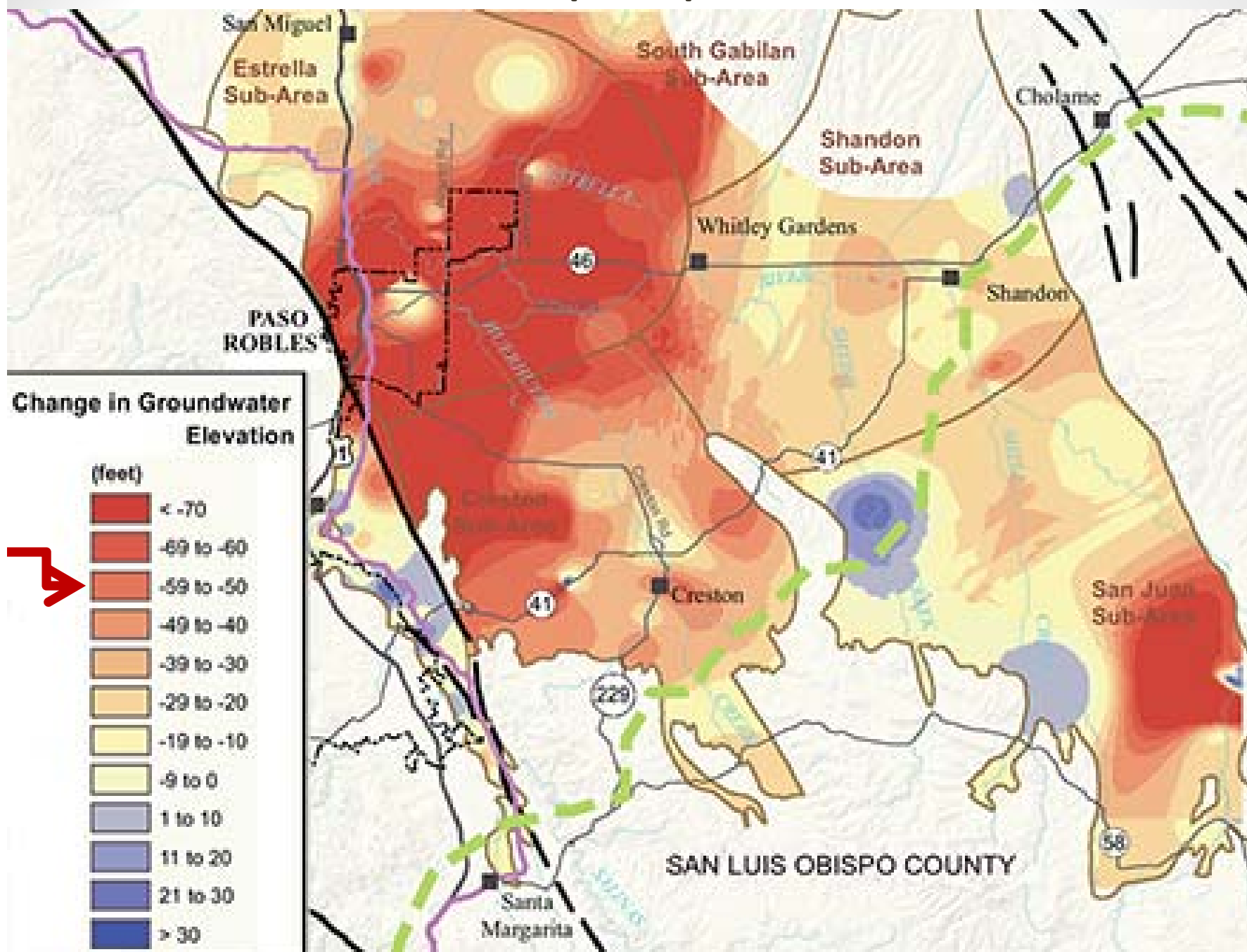
Notice sent to well owners so that well-specific information can be considered

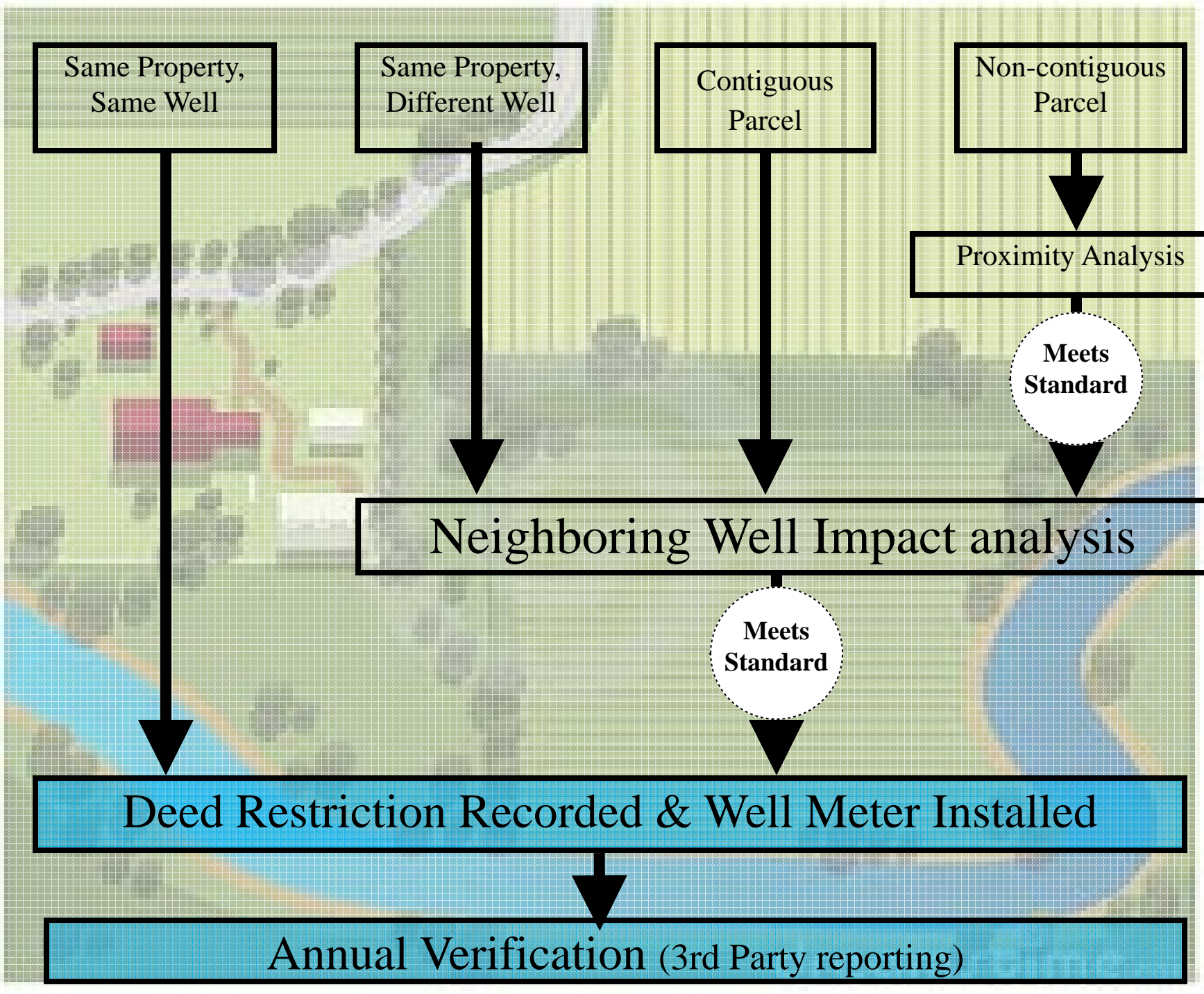
Area of Severe Decline Criteria

Credit cannot be used to increase pumping within severe groundwater level decline area as defined by SLO County

- *Proposed 50' water level decline*
- *Reviewed annually*
- *Annual map of decline published*

Decline Map Sample – Paso Basin





Next Steps

- RCD is refining program framework and defining associated language to support the transactions to come and finalize the draft report for the County.
- Education and Outreach (June – September)
 - Peer Review
 - County Staff Interface
 - Key stakeholders – Ag Community
 - Focus Group, Case Study Development
 - Public at large
- Final program presented for adoption – estimated for October 2014 by BOS

Conclusion



- Program designed to be flexibly tiered, simplified, and user-friendly.
- Issue is complex in nature, and program tries to encompass multiple layers of operational complexity.
- Groundwater basin(s) are natural features that change over time and the program is designed with flexibility and **adaptation** in mind.

Questions?



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Thank You