Water Rights Determination and Reapportionment
August 26, 2009

Components of Determination and Reapportionment

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DECREE

Every Watermaster Service Area has at its origin a controlling document; a Superior Court **Decree**, or in certain instances an Agreement. The **Decree** (or Agreement) contains the factual information pertaining to the water rights under Watermaster Service; it is the lawful document which will be used to settle legal questions involving water rights under Watermaster Service.

The majority of these **decrees** can be broken down into two distinct components; text (or paragraphs) and Schedules. Typically the majority of water right information is contained in the schedules, however; some **decrees** use both the paragraphs and the schedules to completely describe water rights.

These controlling documents contain language describing water rights, decreed or adjudicated to various original landowners by name, including the description and location of their lands that contain decreed irrigated acreage. The description of irrigated acreage for any originally named owner may be found in Schedule I of most decrees. The absence of a named individual is evidence that the individual identified by name had no **decreed** water right.

The typical location description of irrigated lands found in Schedule I utilizes Section, Township, and Range descriptors. Often the section description describes a location down to the ¼, ¼ section (40 acres).

Example: (**Decree** No. 5804) Schedule I;
ERICK ANDERSON: 2.4 acres in SW1/4 SE1/4 Sec. 29, T32 N, R 3 W, M.D.B.& M.

An informative description of lawful subdivisions prepared by the BLM can be found on the "N" drive at **N:\RAID1\Watermaster\Procedure_Reports\General Land Office Primer 1921.pdf**. The location of "irrigated acreage" found in the **decree** in most cases will agree with acreage amounts and locations on the "**Decree** Maps". Remember, the **decree** is the controlling legal document! The map is a visual representation of

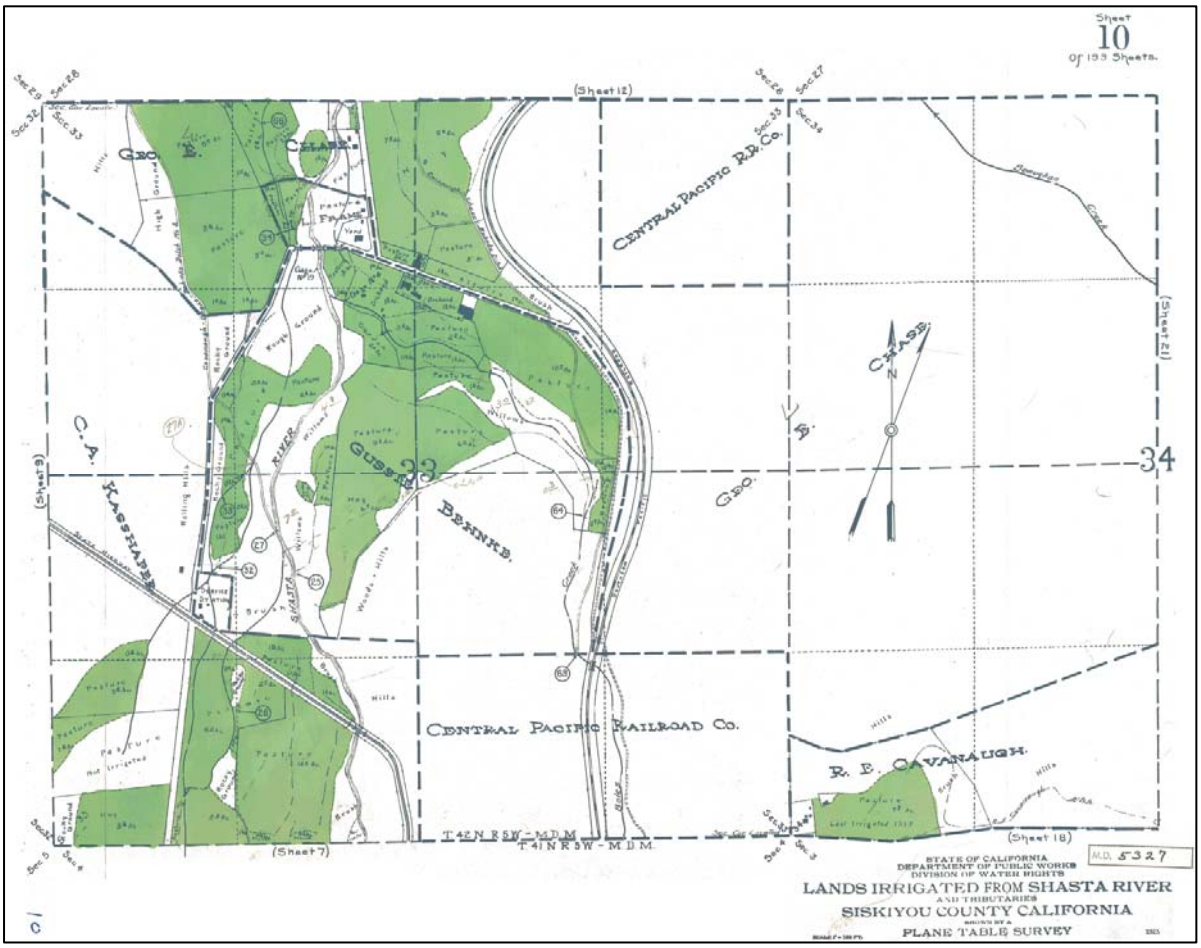
information described in the **decree**. In every water right subdivision (split) performed, the irrigated acreage shown on **decree** maps needs to be confirmed by comparing the acreage to that found in the **decree**.

DECREE MAP

The **decree map** is a visual representation of information presented in the decree. A **decree map** will be titled similar to this example:

STATE OF CALIFORNIA
DIVISION OF WATER RIGHTS
DEPARTMENT OF PUBLIC WORKS
<<<<< MAP OF >>>>>
WXYZ CREEK WATERSHED
<<<<< SHOWING >>>>>
DIVERSION SYSTEMS AND IRRIGATED LANDS
KLMN COUNTY, CALIFORNIA

Here is an example of a **decree map**:



Decree maps are drawn on the same Section, Township and Range coordinates found in Schedule I of the decrees, however they may or may not be drawn to the ¼, ¼ detail. With very few exceptions (N.F. Cottonwood Cr.) the **decree maps** will list the names of decreed owners which will often, but not always, agree with named individuals from schedule I of the decree.

If you are unable to locate an owner by name on the **decree map** you should scan the first few pages of the appropriate decree for language describing substitutions for named individuals. The **maps** are usually prepared prior to the completion of the adjudication, and occasionally a death or sale will have occurred in the interim. Therefore it's possible that a discrepancy between an individual named in the decree or the **map** may not be found in the supporting document.

The **maps** will also contain a legend useful in interpreting locations for specific decreed irrigation points and also decreed irrigated lands.

Watermasters are now using CAD software such as AutoCAD Map to update or create digital **decree maps** and other related maps. **Decree map** image files are inserted into a drawing and scaled as accurately as possible.

Maps are never completely accurate because of several sources of random error. Systematic errors or blunders are simply mistakes and are not discussed here, except to note that engineers who originally created the **maps** may have deliberately introduced small systematic errors by offsetting roads, canals and other linear features from tract or ownership boundaries so the features were visible on a **map**. The first random error is the original engineering study to determine tract boundaries, which includes errors of surveying, and determining ownership, tract boundaries, and decreed irrigated acreage limits. The second is the digitizing and estimating error in drawing the tracts and decreed irrigated acreages on paper. The third source of error is the stretching and wrinkling of decree **maps**. The fourth error source is the error of the scanning optics when creating digital **maps**, as well as the error of pixels representing continuous color mapping. The fifth error source is scaling the scanned **map** in AutoCAD Map. The sixth source of error is digitizing error by the Watermaster in creating vector **maps** (points, lines, arcs) from the scanned **maps**.

DWR TRACTS

Water rights described in various decrees are specific to named individuals. Each of these named individuals is described in schedule I of the typical decree.

The **DWR Tract** has been accepted as a method for tracking named individuals, their decreed irrigated lands and their associated decreed water rights. It appears that the original **Tract** numbering system assigns sequential numbers to individual water right owners based on their locations on the stream system, with those owners furthest

upstream often having the lowest number. The **Tract** numbers are unique; any one **Tract** number should be associated with only one decreed owner found in a decree. There are exceptions that are being corrected as Tracts are resubdivided by DWR. A single **Tract** number (no **sub-tracts**) indicates that the originally decreed irrigated lands are under ownership by a single party. A whole **Tract** is composed of all the original decreed irrigated lands and the entire original decreed water right amount. A **Tract** can be composed of one or multiple assessor parcels.

The **Tract** numbering system can continue to be used in those instances where original **Tracts** of land have been subdivided and sold. If an originally decreed **Tract** of land containing decreed irrigated acreage is subdivided into multiple parcels and sold, each one of the newly numbered parcels containing decreed irrigated lands would be identified by the original **Tract** number with a dashed number appended. For instance, **Tract** 25, if subdivided (split) into two distinctly numbered parcels, ***could be*** renumbered **Tracts** 25-1 and 25-2 since each of the two new **Tracts** has a distinct water right.

If an original parcel was split into one or more differently numbered parcels and ownership remained with the original owner then the need to re-number the **Tracts** and subdivide the water rights would be diminished compared to if one of the parcels was sold. If in the preceding example one of the subdivided parcels was sold to a new owner then a new "**sub-tract**" would need to be created which would require a re-apportioned water right amount to be calculated. There are no limits to the number of **sub-tracts** that can be created. Each new sub-tract would be systematically renumbered by appending a "-1", "-2", "-3" etc. depending on the number of subdivisions to the parent **Tract** number.

If the original **Tract** 99 now has 5 uniquely drawn assessor parcels (and owners) then the Tract numbering would identify that in the following manner. **Tract** 99 becomes **Tract** 99-1; 99-2; 99-3; 99-4; 99-5. It is possible that further subdivisions (splits) could occur producing 99-1-1 and 99-1-2 and 99-1-3. There is no theoretical end to the number of subdivisions possible. The numbering convention is that every succeeding subdivision uses the parent **Tract** number and has appended to it a -1, -2, -3, etc. depending on the number of subdivisions.

All reapportionments of water rights will be done for the whole **Tract** and whatever **sub-tracts** exist, to check past water right splits and ensure the water right sums to the decreed amount for the whole **Tract**. If a water rights reapportionment is necessary in a **Tract** which is composed of numerous **sub-tracts** then EVERY **sub-tract** must be reapportioned in order to confirm the (**Tract**) water right as accurate. When **Tracts** are completely resubdivided to correct water rights errors, then all subdivisions will be redone at the first level, e.g., 99-1, 99-2, 99-xx.

ASSESSOR'S PARCEL MAPS AND RECORDS

Counties have standardized on the system of (Tax) **Assessor's Parcel Maps** with associated **Assessor's Parcel Records**. **A.P. Maps** describe ownership for the purposes of County Assessor's Offices, according to each County's Assessor's Book, Page, and Parcel.

A typical assessor's parcel number (APN) is described as follows:

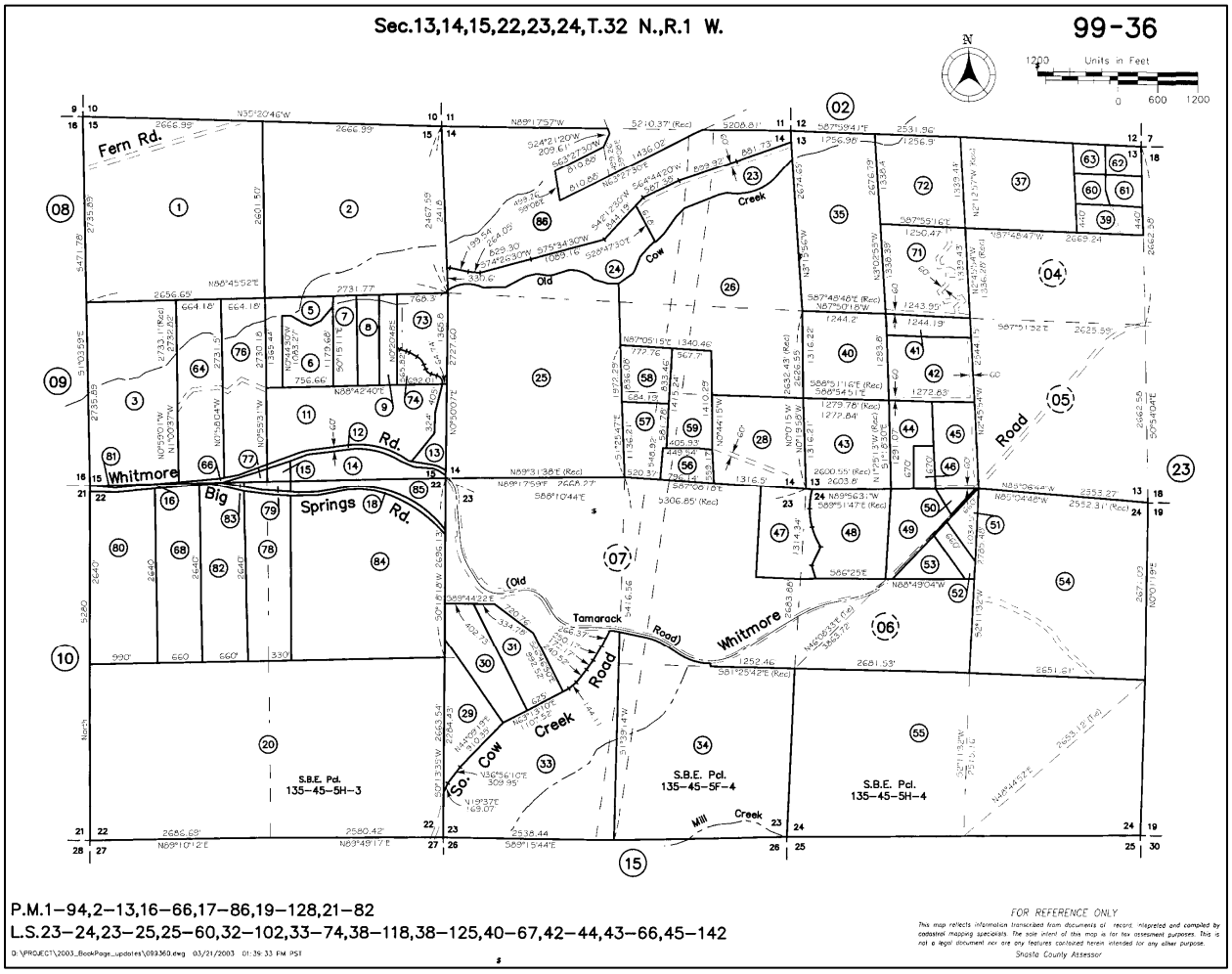
APN = 027-270-016
"027" = Book 27
"270" = Page 27
"016" = Parcel 16.

Parcels are individual pieces of land with one (and rarely more than one) distinct owner, and each parcel has a unique **Assessor's Parcel Number** (**APN**).

A.P. Maps show all of the parcels for a particular Book and Page. Parcels are drawn as carefully as possible by drafters or CAD operators in each County.

However, these maps are for the convenience of the Tax Collector and are not necessarily accurate in terms of parcel shape, parcel area, precise location, direction of boundary lines, and North orientation. For instance, all the parcels must fit contiguously on the map. When one parcel is poorly described in a legal description, the inaccuracy of that parcel will make some or all adjoining parcels inaccurate. Even so, **A.P. Maps** are the best available information for the Watermaster Service to determine ownership in decreed areas.

This is an example of an **A.P. Map**:



Parcels surveyed in the last few decades may be more accurately described in a Record of Survey, Parcel Map (not **A.P. Map**), Survey Map, or other record kept by the County Recorder's Office. Parcels that have no recorded survey may have various descriptions that are more or less accurate, yet do not enable the layman to easily locate the legal parcel on the ground. Typically a survey is required for accurate location of ownership, or to ensure that digital maps are accurate and precise. Use of these more accurate documents and surveys require far more time and money than is available to Watermasters or acceptable to water users.

A.P. Maps may have blank areas that are covered by other **A.P. Maps** covering smaller areas with smaller parcels. **Maps** typically have a scale of 1" = 200', 1" = 400', 1" = 800', etc. These scales become less accurate as the **map** is copied. **Maps** usually show what other maps are adjoining. Index maps show the relationship of **A.P. Maps** within part or all of a County.

Each **A.P. Map** has a unique **Record** (e.g. Property Detail in *Parcel Quest* online, http://www.parcelquest.com/home.htm). This describes the owner's name and address, parcel location, land use, structures, tax assessment, and other information. The **records** go with **maps** to describe ownership, and can be obtained from County Assessor's Offices as well as purchased from vendors.

Watermasters use ***Parcel Quest*** online to query **A.P. Maps** and **Records**. Queries may be made by full or partial **APN** and owner name. Queried **maps** should be saved to a directory. Since maps are TIFF image files, they should be renamed to <book>-<page>-<parcel>.tif and used in programs such as Paint Shop and AutoCAD Map. Records should be saved to Adobe Acrobat .pdf files, by printing from the Web page of the Property Detail to the Adobe PDF printer, naming the file <book>-<page>-<parcel><query date>.pdf, and saving it to a directory.

REAPPORTIONMENT OF WATER RIGHTS

Introduction

Watermasters apportion, regulate and bill for water rights from various Superior Court Decrees. Diversions and Irrigated Acreages maps (decree maps) usually accompany decrees. Further, DWR Tract Maps were developed from each decree, and show as Tracts ownerships that are identified in decrees. The decree maps may show the tract boundaries in bold, dashed lines. Tracts are not legal definitions unless they are identified in the decree. However, the original Watermaster used them to address whole ownerships and the corresponding water rights for all the decrees we administer, so we continue to use tracts.

The following process is our standard method of water rights reapportionment. It is relatively inexpensive and provides reasonably high accuracy to determine how water rights should be subdivided. This method is defensible to the Superior Court Justices under whose authority we provide Watermaster Service.

Whenever water rights are reapportioned or subdivided, the Watermaster always starts by examining the paragraphs and/or schedules in the decree for a decreed owner. The water rights listed by ¼ ¼ Section in schedules, are checked against each ¼ ¼ Section on the decree map. Even water rights that were previously subdivided are redone starting with the decree and decree map. There may have been an error in a past subdivision, and by redoing all the subdivisions for a particular decreed owner, the Watermaster can be confident that the tract is currently subdivided correctly.

When Watermasters want to determine, verify, or reapportion water rights, we use A.P. Maps to determine present day ownership compared to original landowners in the decree. When reapportionment was performed by hand, the decree map was overlaid with a copied, scaled A.P. Map, so that boundaries, creeks, buildings, and other geographic references on the A.P. Map lined up as closely as possible with the same

features on the underlying decree map. Then the boundaries of decreed irrigated acreage were traced on the scaled A.P. Map. A planimeter was used to measure the area in square inches of decreed irrigated acreage within each present-day land ownership parcel. The area of each present-day land ownership parcel was determined by multiplying the area in square inches by the increased or decreased, photocopied scale of the A.P. Map. Then the original water right for each subdivided tract was proportioned by the decreed irrigated acreage within each present-day parcel.

Water rights are now determined, verified, and reapportioned by using AutoCAD Map software, once a scanned, digital decree map is in an AutoCAD drawing. A.P. Maps are saved from Parcel Quest queries and inserted on top of the decree map in AutoCAD. The A.P. Maps are scaled as accurately as possible and lined up with geographic features on the decree map. Then the A.P. Maps are digitized on new AutoCAD layers. Boundary polygons are created for each area of decreed irrigated acreage inside each Assessor's Parcel, and the area is determined for each polygon. These areas are not usually exactly the same as decreed, however, so the Watermaster uses Excel (creating Tract Management Excel spreadsheets for each decreed owner) to note the area of each polygon (calculated using AutoCAD) as a proportion of the whole measured area for the decreed owner as determined in AutoCAD. Then these proportions are applied to the decreed areas to determine the decreed irrigated acreage within each present-day parcel. These areas are used to divide the water rights.

The minimum allowable water right for all water right reapportionments is 0.005 cfs. Lesser water rights were allowed in the past, however, this resulted in unusable water rights in the field. When decreed irrigated acreage is subdivided to an acreage that would result in a water right less than 0.005 cfs, that acreage is combined with other acreage in the Tract in one of two ways. The acreage will either be reapportioned among the Sub-Tract(s) with which it was simultaneously created, or distributed among adjacent Sub-Tracts. This acreage will not be considered a separate Sub-Tract, nor will it be assigned a water right that is added to the Control Cards or to the Field Schedules.

For example, if a subdivision of Tract 26 would result in:
Sub-Tract 26-1 with 0.283 cfs,
Sub-Tract 26-2 with 0.514 cfs, and
Sub-Tract 26-3 with 0.0032 cfs,

then Sub-Tract 26-3 will be dropped. In this case, Sub-Tract 26-1 would gain 0.001 cfs, and Sub-Tract 26-2 would gain 0.002 cfs:

Sub-Tract 26-1 = 0.283 cfs + 0.001 cfs = <u>0.284 cfs</u>
Sub-Tract 26-2 = 0.514 cfs + 0.002 cfs = <u>0.516 cfs</u>
~~Sub-Tract 26-3 = 0.000 cfs~~ (right was redistributed)

Example

In this example, a Tract spreadsheet is developed for Susan River DWR Tract 159, on Bankhead Creek tributary to Baxter Creek. Superior Court Decree No. 8174, issued in 1955, defines water rights in this area.

This method does not eliminate errors in parcel line locations, parcel areas, and decreed irrigated acreages within parcels. However, with care it should reduce errors and distribute them somewhat evenly among all parcels.

This example is simpler than it looks! This procedure is long in an attempt to explain each step. After the first one, the second Tract spreadsheet will go fairly quickly.

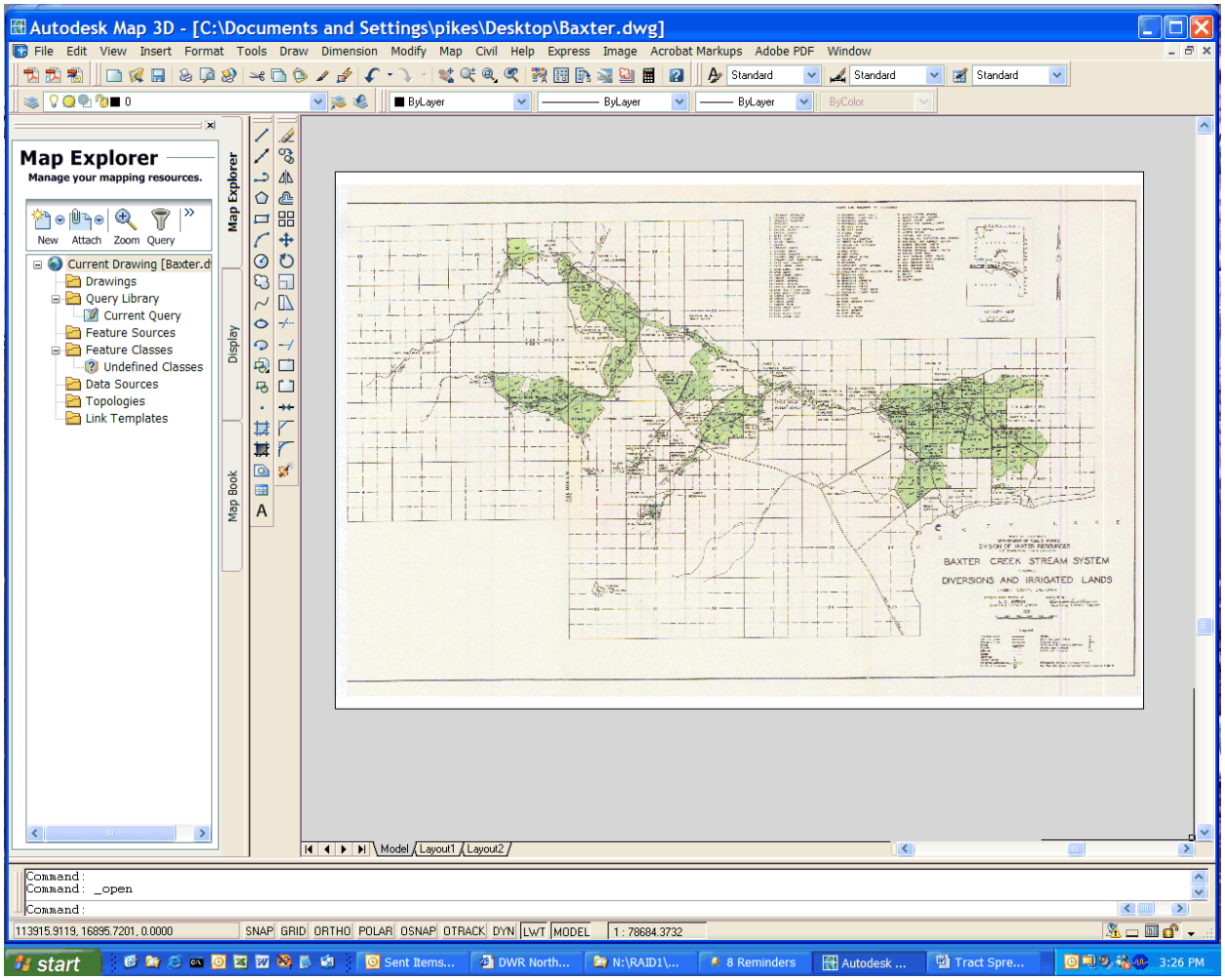
Insert Decree Map into New Drawing, or Open Current AutoCAD Decree Drawing

Decree maps are (or will soon be) rubbersheeted to Section lines in California State Plane Coordinates. Eventually, all rubbersheeted decree maps will be inserted into AutoCAD drawing "base maps" that have the Section lines, scanned quad maps, and rubbersheeted decree maps. Decree map images in the Adobe PDF, TIFF image, and other file formats are kept in the directory N:\RAID1\Watermaster\Digital Decrees & Maps\<Stream>\scans\. If the decree map images are already rubbersheeted, they are kept in the directory N:\RAID1\Watermaster\Digital Decrees & Maps\<Stream>\scans\rubbersheeted\.

If the Watermaster has already properly started an AutoCAD Map of a decree drawing, then continue to modify this decree drawing. Don't create a new decree drawing solely for the purpose of creating a Tract Spreadsheet.

Open the AutoCAD drawing containing the scaled map of Diversion and Irrigated Acres (decree map). In this case, the sequence is File → Open → N:\RAID1\Watermaster\Digital Decrees & Maps\Baxter Creek\Maps\CAD Maps\Lower Baxter Cr. CAD Map\3-17-2006 with SLP layout.dwg .

Make sure that the decree map image is visible and is rubbersheeted. See the document N:\RAID1\Watermaster\Procedure_Reports\Rubbersheeting_Procedure_AutoCAD 2006_20071203.doc for an explanation of how to rubbersheet an image.



Create Layers

Create layers (Format → Layer, then add, modify or delete layers) that will be needed for this work. These names are suggestions, other names will work as long as they are descriptive to most users. You may use the following commands to copy these layers from an existing drawing:

Tools → Design Center → Navigate to N:\RAID1\Watermaster\Digital Decrees & Maps\Tract Management Layers.dwg → double-click drawing icon → double-click Layers icon → select all layers, drag into current drawing.

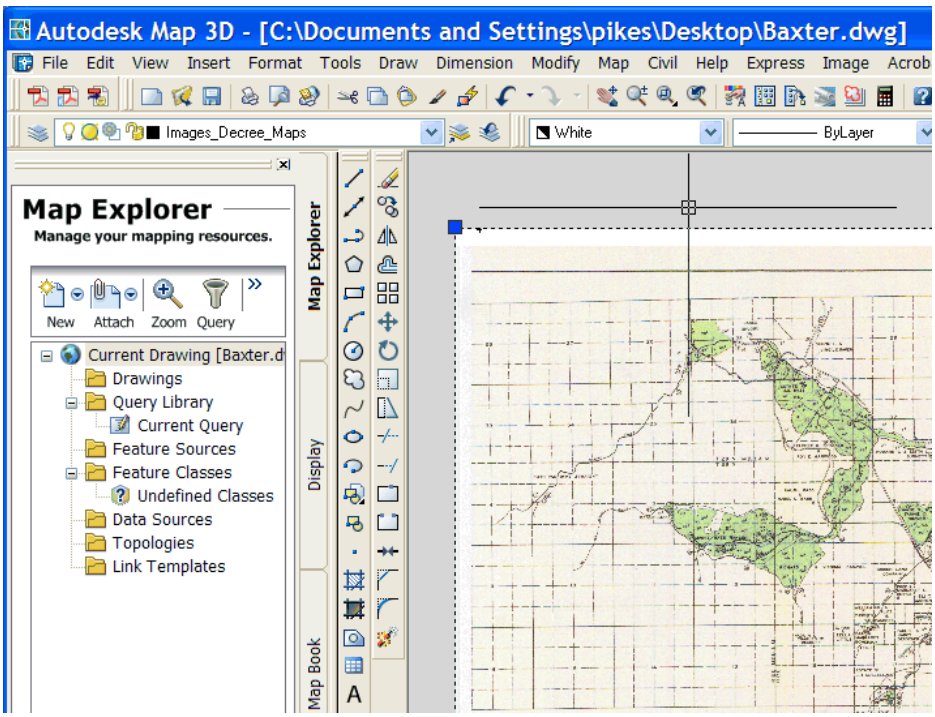
LAYER NAME	DESCRIPTION
AreaCheck	For creation of permanent individual area polygons of decreed irrigated acreage within assessor's parcels, usually formatted blue, 0.35 mm

Assessor's Parcels Lines	Assessor's parcel lines digitized from rubbersheeted A.P. Maps. These are permanent, usually formatted red, 0.35 mm
Assessor's Parcels Text	Assessor's parcel text: xxx-xxx-xxx. These are permanent, usually formatted brown, 0.35 mm
Decreed Acreage Text	for acreage in Section ¼ ¼'s, from decree, or comparison with acreage measured in AutoCAD
Decreed and Owner Acreage Text	for result of Area command in AutoCAD, this text will be created for each "AreaCheck" polygon and kept permanently. Usually formatted black, 0.35 mm
Decreed Irrigated Acreage Lines	Decreed irrigated acreage lines digitized from decree maps. These are permanent. Usually formatted color 35 (light orange), 0.35 mm
DWR Tract Lines	DWR Tract lines digitized, these are approximate and are permanent
Images AP Maps	for inserted TIFF file of A.P. Maps, one layer for each A.P. Map. These layers are temporary for use during a Tract reapportionment
Images Decree Map <*number or name*>	for inserted TIFF file of decree maps – use one layer for each map
Images DWR Tracts	for inserted TIFF file of DWR Tracts, one layer for each Tract Map
Images Quads 1-24000	for inserted 1:24,000 Quad Maps, may be put all on one layer or on separate layers as desired
Section Lines from Quads	Section lines digitized from digital 1:24,000 quad maps. Usually formatted green, 0.35 mm
Section Qrtr Qrtr Lines	¼ ¼ section lines digitized from midpoints and mtp's of section lines,

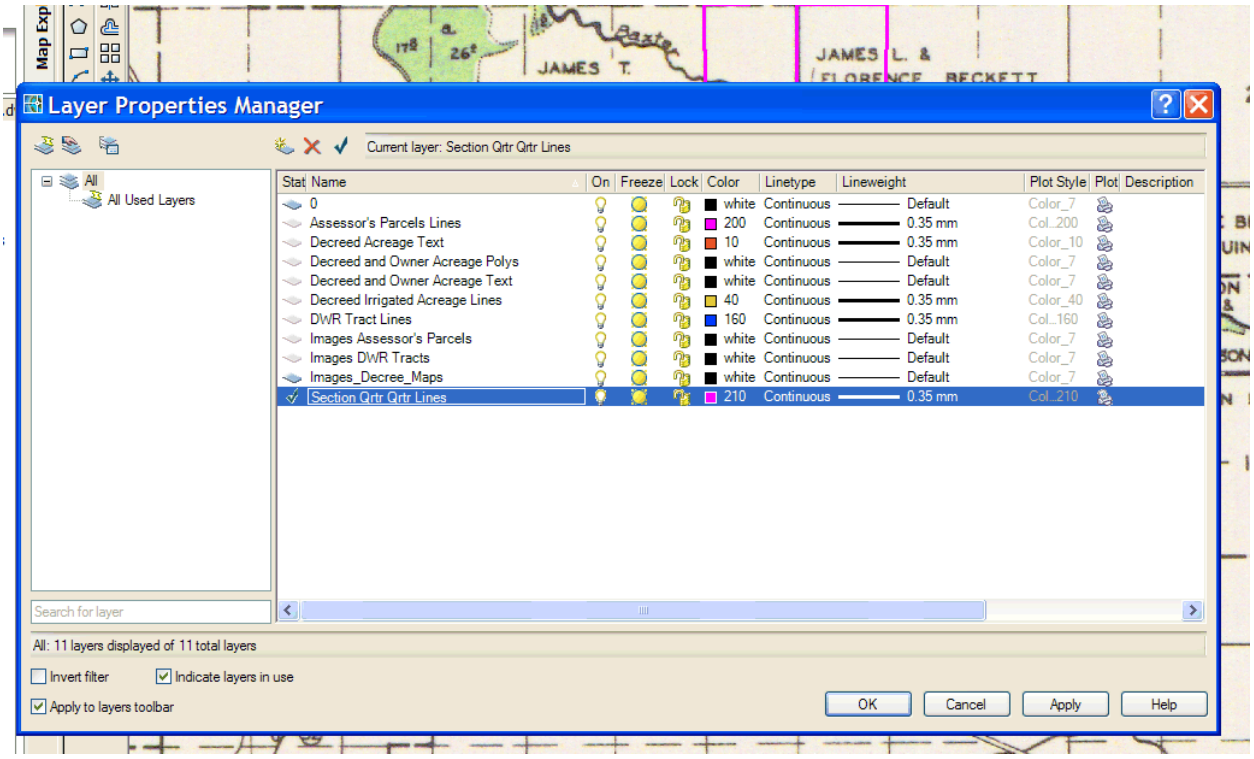
	usually formatted light blue, 0.35 mm

Format the layers for visibility to make the work easy for you. For example, use contrasting colors so each feature stands out. The color can be changed later to a more standard hue for plotting. Adjust the lineweight of each layer so that the lines stay the same width on the screen regardless of zoom level. This way, lines will appear wider and will be easier to see when you are zoomed out. The lines will appear thinner and will not dominate the screen when you are zoomed in.

Make sure the image of the decree map is on the Images Decree Map layer. An easy way to confirm this is to click the edge of the image, and see what layer shows up in the Layer Properties Manager window:



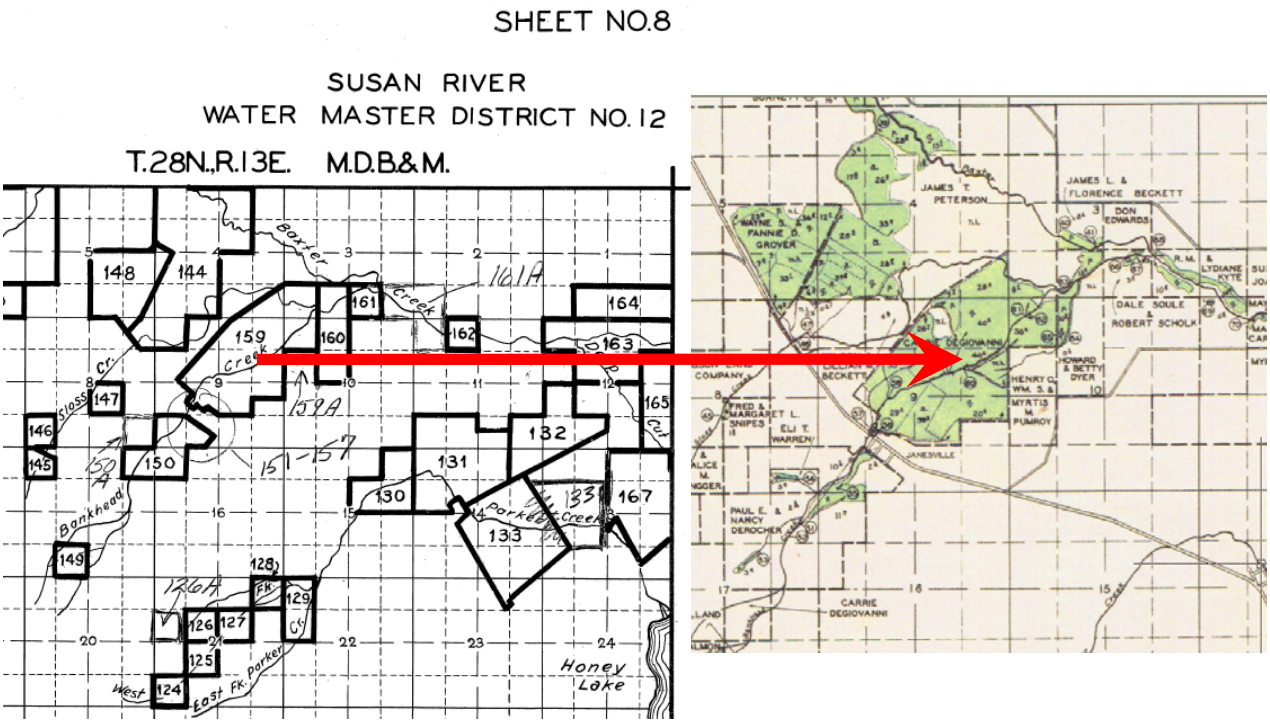
If the layer is not correct, click the Down Arrow at the right side of the window, and click on the correct layer name. This will change the layer of the image to the correct layer:



Determine Tract Location in Drawing

The Watermaster needs to determine where Tract 159 is on the Decree Map. If the need for this Tract subdivision came from a parcel split, then the Watermaster has already examined the Control Cards and Field Schedule, and knows that the Decreed Owner is “DEGIOVANNI, C & C”. Most decree maps list the decreed owners, so it may be relatively easy to locate the Tract on the decree map. Also, most decree maps have heavy dashed lines signifying Tract boundaries to help the Watermaster locate the Tract.

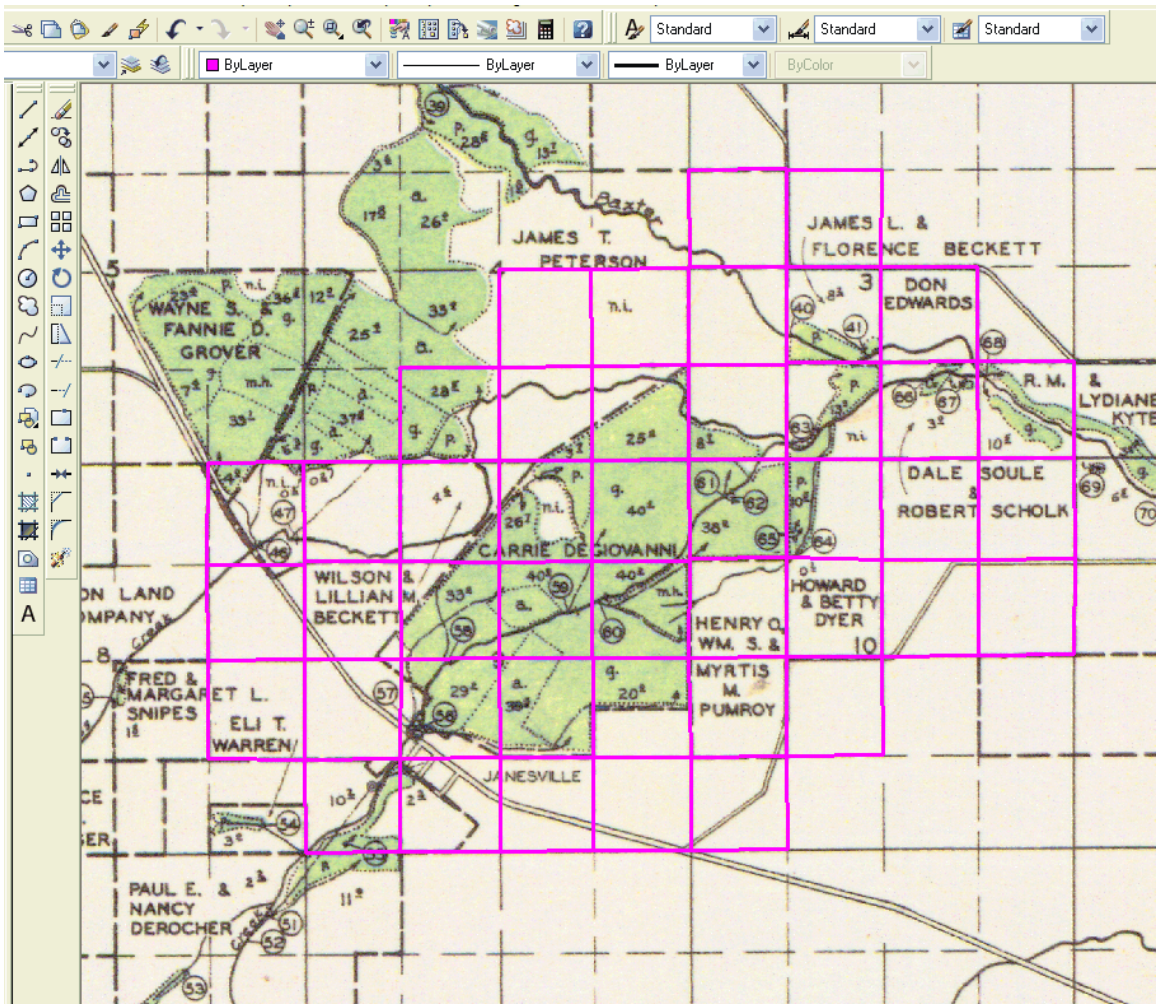
Another way of determining where the Tract is on the decree map is to look at the DWR Tract Maps. These are kept as Adobe PDF files and TIFF images in the directory N:\RAID1\Watermaster\Digital Decrees & Maps\11x17 Tract Book\ . By comparing the tract map and decree map, it is apparent where Tract 159 is on the decree map:



Digitize Section ¼ ¼ Lines

Change the current layer to Section Qrtr Qrtr Lines. Begin digitizing Section ¼ ¼ lines. Do this carefully, zooming in to make sure you get the proper intersection of each Section ¼ ¼ line. Be aware that Section line alignments may change as they cross Township and Range lines, and sometimes each row or column of Sections shifts slightly as the Section line is crossed. This will require short line segments to go from one ¼ ¼ intersection to the next, shifted ¼ ¼ intersection (perhaps only 100 feet away in reality).

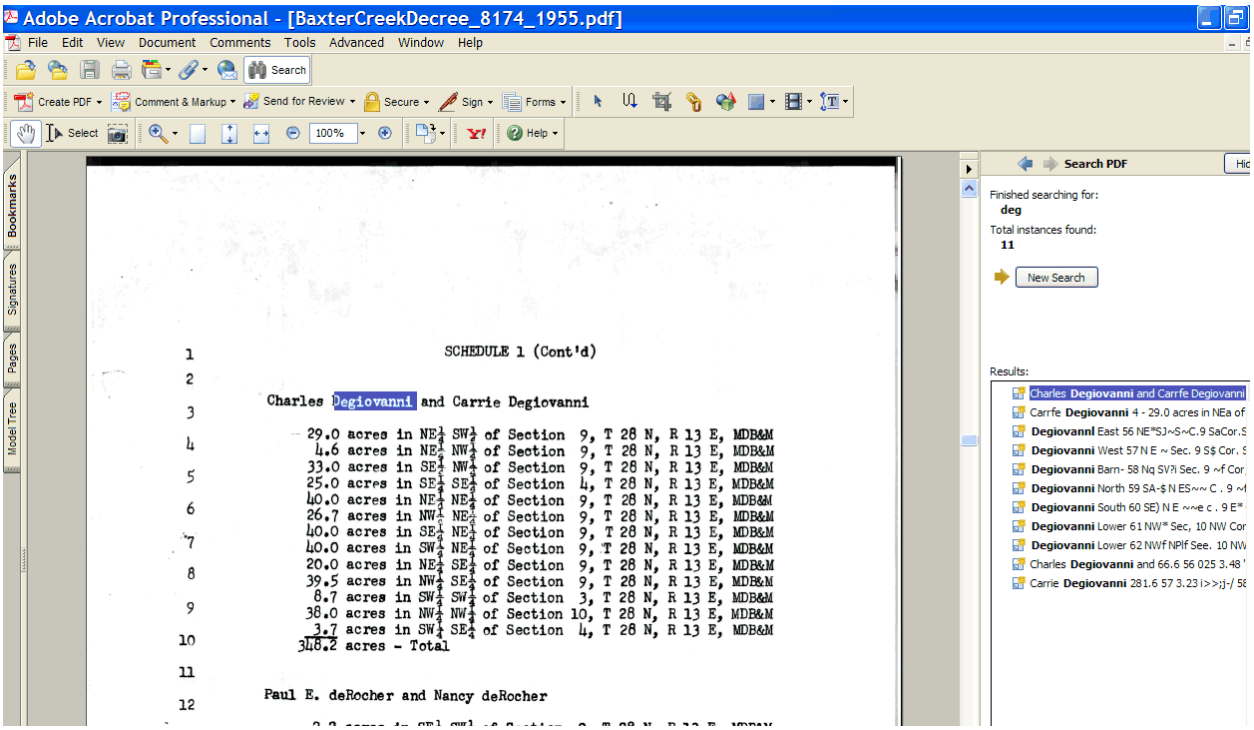
Section ¼ ¼ lines may be digitized for just the DWR Tract under consideration, or for the whole decree map if there is time. In this example, pink Section ¼ ¼ lines are digitized for the Tract under consideration, and a bit more around each side:



Read, Search the Decree for Decreed Irrigated Acreage, Water Rights

Next, the Watermaster needs to read the entire decree if he has not already done so. Then search the decree for all decreed irrigated acreage and water rights for Degiovanni. Note that the decree map lists the owner as “Carrie Degiovanni” and the decree lists the owner as “Charles Degiovanni and Carrie Degiovanni”. For some reason, the listed owners changed between the time the map was drawn and the decree was issued. This is not uncommon. Sometimes ownership changes completely, such that the owner name on the map is not the same as in the decree. In this case, it is helpful to make a quick check of the Township, Range and Section on the decree map, and check against the Schedule containing the irrigated acreage in the decree.

All of the decrees under Watermaster Service by Northern District have been scanned as Adobe PDFs. These documents have been processed with Optical Character Recognition (OCR) to find all locatable text in the decrees, and the PDFs were saved with the OCR text. Therefore it may be useful to search the decree for the owner name using the Edit → Search command. Here is the result of searching for part of the name "Degiovanni", searching with just the first 3 letters "deg":



Decreed irrigated acreage is usually listed like the following, which comes from Schedule 1 on Page 13 of the Baxter Creek Decree. Note that these lines contain all the acreage for Degiovanni:

SCHEDULE 1 (Cont'd)

Charles Degiovanni and Carrie Degiovanni

29.0 acres in NE¼ SW¼ of Section 9, T 28 N, R 13 E, MDB&M
4.6 acres in NE¼ NW¼ of Section 9, T 28 N, R 13 E, MDB&M
33.0 acres in SE¼ NW¼ of Section 9, T 28 N, R 13 E, MDB&M
25.0 acres in SE¼ SE¼ of Section 4, T 28 N, R 13 E, MDB&M
40.0 acres in NE¼ NE¼ of Section 9, T 28 N, R 13 E, MDB&M
26.7 acres in NW¼ NE¼ of Section 9, T 28 N, R 13 E, MDB&M
40.0 acres in SE¼ NE¼ of Section 9, T 28 N, R 13 E, MDB&M
40.0 acres in SW¼ NE¼ of Section 9, T 28 N, R 13 E, MDB&M
20.0 acres in NE¼ SE¼ of Section 9, T 28 N, R 13 E, MDB&M
39.5 acres in NW¼ SE¼ of Section 9, T 28 N, R 13 E, MDB&M
8.7 acres in SW¼ SW¼ of Section 3, T 28 N, R 13 E, MDB&M
38.0 acres in NW¼ NW¼ of Section 10, T 28 N, R 13 E, MDB&M
3.7 acres in SW¼ SE¼ of Section 4, T 28 N, R 13 E, MDB&M
348.2 acres - Total

Decrees usually list diversion points also, as shown from Schedule 2 on Page 27 of the Baxter Creek Decree. These lines show some but not all of the diversions that the Degiovanni ownership may use for irrigation:

23	Degiovanni East Ditch	56	NE¼ SW¼ Sec. 9 T 28 N, R 13 E	S¼ Cor. Sec. 9 T 28 N, R 13 E	N 34° W	2100
24	Degiovanni West Ditch	57	NE¼ SW¼ Sec. 9 T 28 N, R 13 E	S¼ Cor. Sec. 9 T 28 N, R 13 E	N 34° W	2025
25						
26	Degiovanni Barn-yard Ditch	58	NE¼ SW¼ Sec. 9 T 28 N, R 13 E	S¼ Cor. Sec. 9 T 28 N, R 13 E	N 20° W	2600
27			Sheet 5			

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In the Baxter Creek Decree, the water rights for Degiovanni may be found in Schedule 3, on Page 32. Note that there are two priorities, a First Priority of 0.25 cfs and a Second Priority of 3.23 cfs.

SCHEDULE 3 (Cont'd)

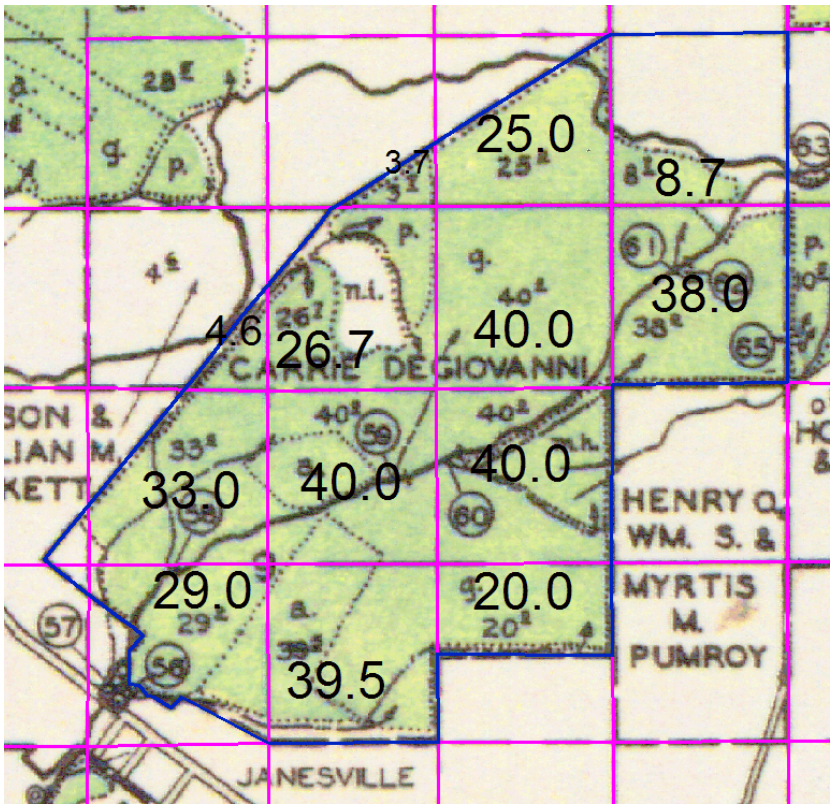
Name of claimant	Acreage to be supplied	Diversion number as per D.W.R. Map	Allotments cubic feet per second: First priority class	Second priority class	Third priority class	Total
Paul E. deRocher and Nancy deRocher	3.0 3.0	53 55			0.10	0.10
George A. Taylor and Ollie Bernice Taylor	8.0 Domestic	54 54a	0.02		.13	0.15
Roger T. Remick and Fay Tr 157 Remick	1.0	55a	.02			0.02 157
Carl S. Orchard and Tr 158 Charles F. Orchard	0.5	55b	.01			0.01 158
Charles Degiovanni and Carrie Degiovanni	66.6 281.6 348.2 ✓	56 57 58 59 60 61 62	.25	3.23		3.48 159

Digitize Text of Decreed Acreage,
Compare to Decree Map

Digitize the Tract Boundary if it is shown on the decree map. Otherwise, digitize it based on the outside boundary of each Section ¼ ¼ with decreed irrigated acreage for that particular decreed owner. If the Tract Boundary is very close to a Section ¼ ¼ line, then the tract line was meant to be coincident.

If the Tract Boundary edges are made up of Section ¼ ¼ lines, these line segments can be created on the DWR Tract Lines layer by copying them from the Section Qrtr Qrtr Lines layer. Use the Express → Layers → Copy Objects To New Layer command to do this quickly and easily.

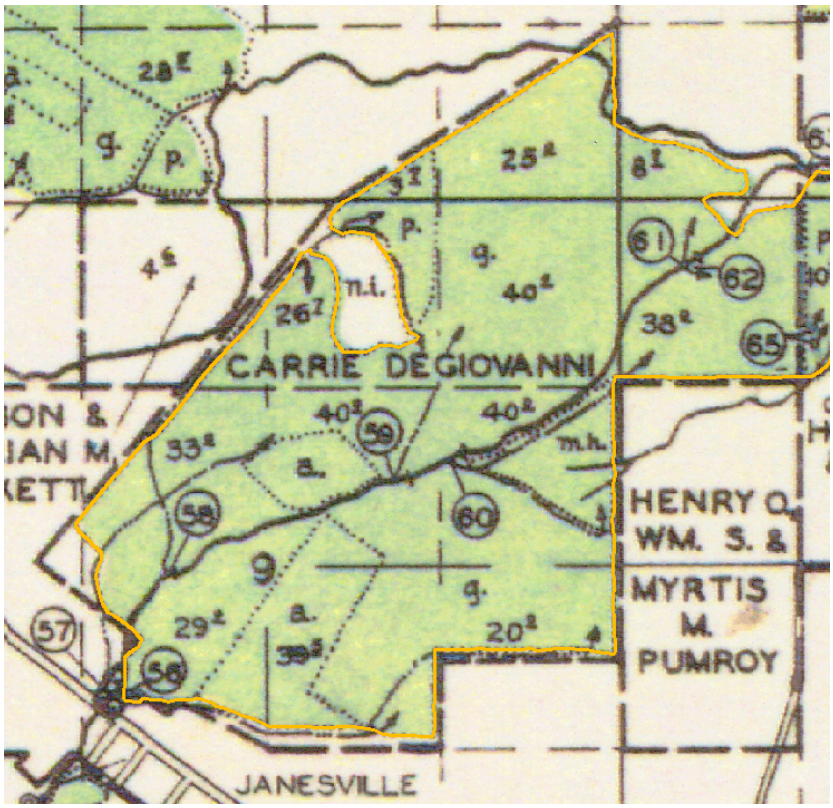
Digitize text for the decreed irrigated acreage of each Section ¼ ¼. Note in this example that the acreage shown on the decree map agrees with all of the text from Schedule 1 of the decree. Sometimes the acreage does not agree, and then the decree controls. Every line of the schedule needs to be mapped out this way to ensure that the decree maps are accurate. Otherwise, use the decree to update the decree map irrigated acreage:



Digitize Decreed Irrigated Acreage Lines

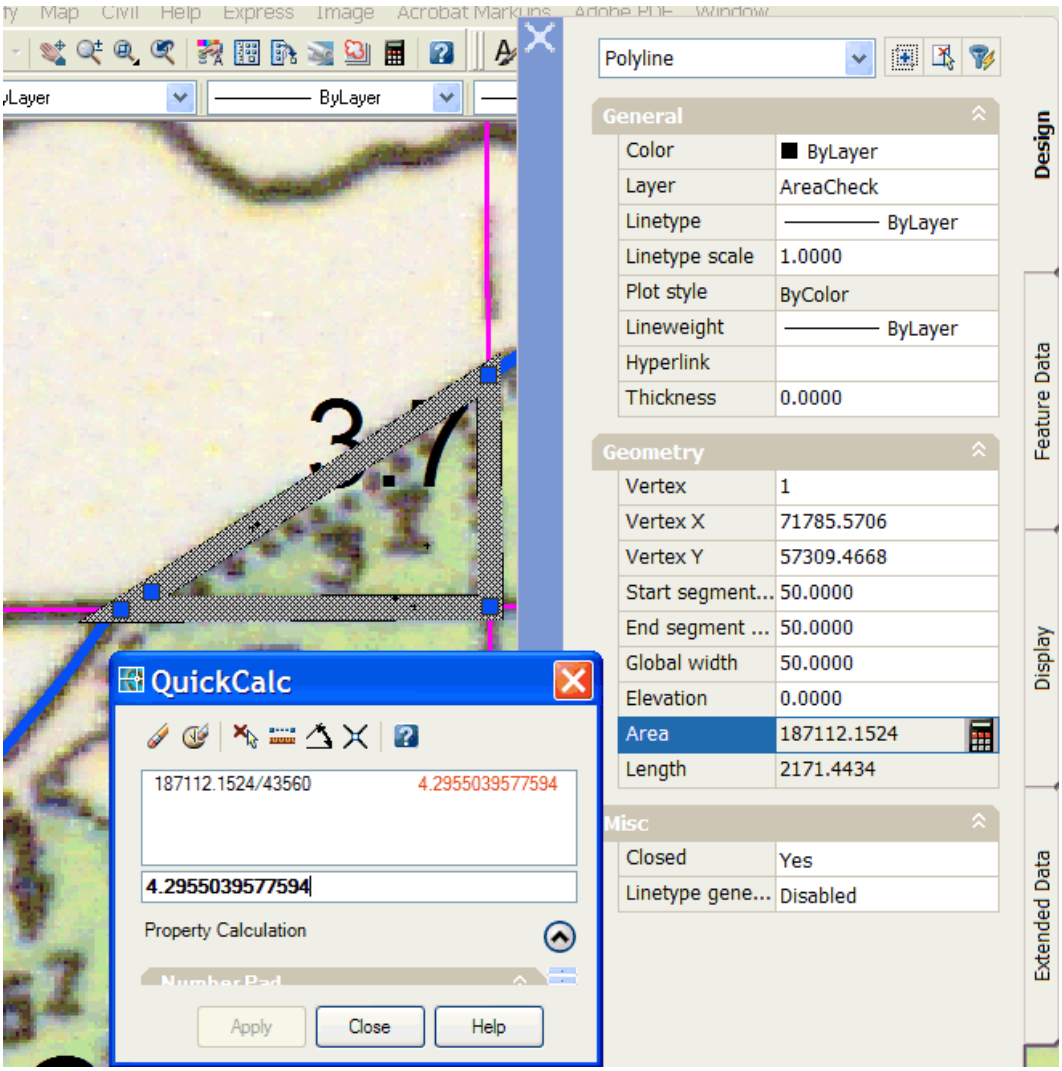
This step was left until this point in the process, so that the Watermaster has the tract lines and the decreed irrigated acreage text to look at. The location of the decreed irrigated acreage may be shifted from that shown on the decree map, based on the acreage indicated by text. Decreed irrigated acreage lines are sometimes placed for convenience directly adjacent to Section, Tract Boundary, Road, Ditch or other lines so the viewer can see them. In fact, the decreed irrigated acreage lines are sometimes intended to be coincident and exactly overlay lines that they are next to. On the other hand, the decreed irrigated acreage line may not be precisely parallel to the other line (such as a fence), showing that it is in fact a separate line.

Change the layer to Decreed Irrigated Acreage Lines. Begin digitizing decreed irrigated acreage. At first, the Watermaster may digitize lines as shown on the map. Then, the Watermaster needs to carefully consider each line. Is it separate from any other lines, so that it is clearly to be placed as shown? Or, is it right next to another major feature, such that it is intended to be on top of that feature? The Watermaster may use the OSNAP command or Grips to move the line over onto the adjacent feature. It is useful to make quick checks of the area of each portion of decreed irrigated acreage within each Section ¼ ¼:



Areas can be quickly checked using the Bpoly command. Change to the AreaCheck layer. Use the Bpoly command, and select inside an area bounded by digitized lines. Double-click on the resultant polygon. This will start the Properties command and bring up a dialog box. Click on the number in the “Area” result. This brings up a calculator icon to the right. Click on the calculator. The result is in square feet, the same units as the AutoCAD drawing. Enter the text ***/43560*** after the area, and hit Enter.

In the following example, the decreed irrigated acreage is given as 3.7 acres, and the Bpoly result of using the Tract Boundary and Section lines is 4.3 acres. In this case, the Northwestern dotted line is correct, instead of using the Tract Boundary. The Southern and Eastern decreed irrigated acreage lines are coincident with the Section lines:



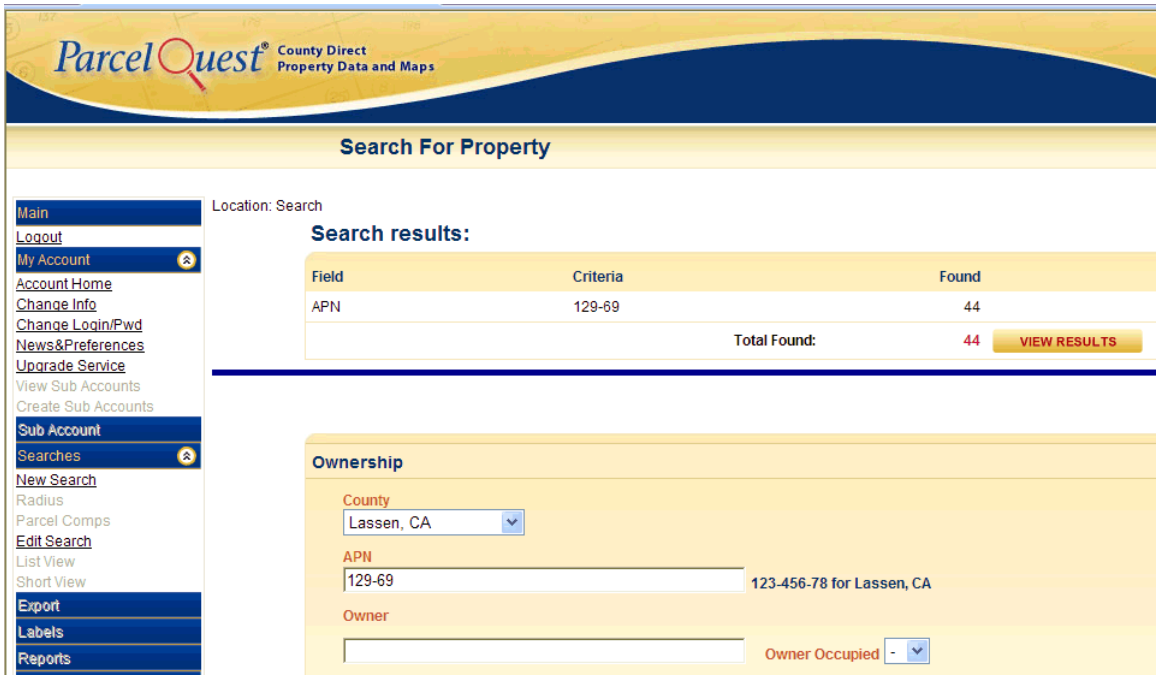
Query Assessor's Parcel Maps from Parcel Quest

Present day ownership is likely not the same as when the decree was written, due to parcel splits, parcel combinations, and lot line adjustments. The Watermaster Service accordingly reapportions the water rights for each parcel. Note that Watermasters do not modify water rights, we merely reapportion the decreed water rights according to current property ownership.

Search the Control Card document, in this case N:\RAID1\Watermaster\Control_Cards\2007 Service Areas\Susan River 2007.doc, for the decreed owner (Degiovanni). If the decreed owner has more than one Tract, the Watermaster should look at the cards for the appropriate tract. Note the Parcel No. Book and Page for each card. Write down the Books and Pages to query in Parcel Quest, **www.parcelquest.com**. At the time of this writing, the User Name is ***water128***, and the password is ***14432***.

If Parcel Quest does not have the most recent information, which is the usual case before the July billing, then the Watermaster has to get the most recent A.P. Maps from the County Assessor's Office. A visit may be required, however, the Watermaster should find out if the CAO can email the scanned A.P. Maps and whichever Records recently changed, or FAX the Maps and Records.

If Parcel Quest does have the most recent information, then the Watermaster should query the book and page:



Select "View Results" to see a line for each Assessor's Parcel on the page. There is a Map button for each record; in this case it will be the same map for each because each record is for the same Book and Page. The user may click on the A.P. Number in the

APN column to see the details for that parcel. One important number here is Assessment Total Value, since we bill to each user based on the most valuable parcel the user owns. Note that there are also Map and Index buttons to view the A.P. Map and A.P. Book Index Maps.

All A.P. Maps for all DWR Tracts for all WMSA's were queried and saved on May 24, 2006. The Watermaster should use these files unless it is known that more recent A.P. Maps exist. These maps can be used from the directories in which they are stored, N:\RAID1\Watermaster\Service_Area_Tables\<WMSA>\All_AP_Maps_20060524\<County>\ . Newly queried maps and scans of new maps that are FAXed to us, should be saved in these directories. Save the Map files as xxxxx_today'sdate.pqm.

Right-click on the Map button and select "Save Target As." In this case, for the Susan River, the six applicable maps should be saved in the N:\RAID1\Watermaster\Service_Area_Tables\Susan\All_AP_Maps_20060524\Lassen_Co\ directory, as:
12913_20070208.pqm,
12914_20070208.pqm,
12916_20070208.pqm,
12919_20070208.pqm,
12959_20070208.pqm, and
12969_20070208.pqm

The List View may also be saved in this directory as PDFs printed from the Parcel Quest page. For example, in this case the List Views were saved as the files:
12913_Records_20070208.pdf,
12914_Records_1of2_20070208.pdf,
12914_Records_2of2_20070208.pdf,
12916_Records_20070208.pdf,
12919_Records_20070208.pdf,
12959_Records_1of3_20070208.pdf,
12959_Records_2of3_20070208.pdf,
12959_Records_3of3_20070208.pdf,
12969_Records_1of2_20070208.pdf, and
12969_Records_2of2_20070208.pdf

The .pqm files are actually TIFF (tagged image file format) images. However, they have to be copied and renamed. For this example, the image files were copied to:
12913_20070208.tif,
12914_20070208.tif,
12916_20070208.tif,
12919_20070208.tif,
12959_20070208.tif, and
12969_20070208.tif

These TIFF files are rotated, so the Watermaster may want to open them in Paint Shop or Picture Viewer, rotate them 90 degrees, then resave them. Note that all the A.P. Maps that were queried and saved in May of 2006 are already saved as TIFFs and are correctly rotated.

These files are also 2-bit color, having only the colors black and white. This is convenient for insertion into AutoCAD, where the white portion of the image will automatically be transparent. This is convenient for overlaying these image files on top of decree maps.

Overlay Assessor's Parcel Maps

Insert the A.P. Map images into the AutoCAD drawing. The scaling for these maps usually ends up being in the range of 2,000 to 20,000, so when the scale option comes up (or the dialog box has a spot for it), try a scale of 10,000. Change the images to the Images Assessor Maps layer. Move the maps close to the proper location, and move, scale and rotate the maps until they are as close as they can be.

Next, rubbersheet the images. Decree map images are held as correct once they are rubbersheeted. Make the A.P. Map images fit the decree map images.

Important: when each image is rubbersheeted, it should be saved as xxxxx_today'sdate_rubbersheeted.tif, and its AutoCAD World file should be saved as xxxxx_today'sdate_rubbersheeted.tfw . This way, the image is hardcoded with the same coordinates as the decree map so it will always line up correctly. Export the rubbersheeted A.P Maps to: N:\RAID1\Watermaster\Digital Decrees & Maps\<Stream>\scans\rubbersheeted\AP_Maps\.

If the user has inserted several A.P. Maps at once, it may be confusing to look at adjoining maps all at the same time. Use the "Image" command to Unload those images that don't need to be visible. Use the Reload command to make them visible when needed.

Digitize A. P. Map Lines

Digitize ownership lines on top of the rubbersheeted A.P. Maps. Where the A.P. Maps do not exactly overlay, split the difference in the location of property lines that are shown on both maps. Make sure to digitize at least one parcel beyond the edge of the Tract.

Calculate Area of Decreed Irrigated Acreage in Each Parcel

Now that decree maps and ownership parcel lines fit the Section lines, the decreed irrigated acreage can be determined for each parcel in the DWR Tract. The easiest way to do this may be to use the Bpoly command.

To determine the areas of many polygons at once, the GIS functions of the Map menu in AutoCAD Map may be used. However, this is more complex and the Map course materials and Map help should be used for reference.

Drawings for Tracts are kept in the directories:
N:\RAID1\Watermaster\Service_Area_Tables\<Service Area>\Tract Mgmt Sheets\. One drawing is used for all Tracts, and new information added as necessary. Watermasters may create working drawings to subdivide a DWR Tract or decreed owner's water right, usually in directories such as
N:\RAID1\Watermaster\Digital Decrees & Maps\<WMSA>\Maps\CAD\Tractxxx .

Once areas are obtained, they should be entered into a Tract Subdivision sheet in the appropriate Tract Management Spreadsheet. An example or template of these spreadsheets is the file: N:\RAID1\Watermaster\Service_Area_Tables\Shasta\Tract Mgmt Sheets\Tract P388 Mgmt Sheet Webb Brothers Company.xls .

Completed spreadsheets are kept in the directories:
N:\RAID1\Watermaster\Service_Area_Tables\<Service Area>\Tract Mgmt Sheets\. Each DWR Tract has its own spreadsheet. Watermasters may wait until a split needs to be done before creating a particular Tract Management Spreadsheet.

CONTROL CARDS / Tract Databases

Control Cards are summaries of water rights for each DWR Tract or subdivided Tract (see DWR Tract discussion below). The **control cards** are actually row entries in MS Excel spreadsheets called **Tract Databases**.

There should be a unique **control card** for every Tract or sub-tract regardless of ownership. The **Tract Databases** are maintained and updated continually and kept in the directory N:\RAID1\Watermaster\Control_Cards\xxxx Service Areas\ , where "xxxx" is the year. These replace the old 8.5" x 11" paper sheets kept in "**Blue Binders**" identified by County name and creek/river name.

They provide the owner name and address, and the water right to be billed for that tract or sub-tract. **Cards** are used to update the Watermaster Billing that is sent to County Tax Assessors and to users under Direct Billing on or before June 15 of each year. (Billing was previously sent out by August 10 of each year.)

Here is an example of a **Control Card**, printed from a **Tract Database**:

Updated 6/06

COW CREEK SERVICE AREA
WATERMASTER CONTROL CARD

TRACT NO.	TAX CODE	PARCEL NO.	BILLING CFS
42	54001	098-230-011	0.845

NAME:

WENDT FAMILY LIVING TRUST
WENDT, BRUCE L. & L. K.
DBA GRAY PINE FARM
BOX 31
OAK RUN, CALIFORNIA 96069

DECREED NAME: IDE, D. & A. (CLOVER CREEK)
& BALLARD (MILL, OAK RUN CREEK)

COUNTY: SHASTA

CREEK: OAK RUN, MILL, CLOVER CREEKS

NOTES:

1025/242

MILL CREEK	0.416 CFS	* WELCH & STRAYER DITCH, DECREE No. 5804.
CLOVER CREEK	0.045 CFS	WELCH & NAILOR DITCH, DECREE No. 6904.
OAK RUN CREEK	0.383 CFS	WELCH & STRAYER DITCH, DECREE No. 5701.
	0.8446 CFS	

* WATER RIGHT AMOUNT CHANGED FROM 0.50 CFS TO 0.416 CFS PER 1931 DITCH SHARING AGREEMENT. SEE ND WATERMASTER FILES (KT 9-30-03)

Control Cards are headed by the Watermaster Service Area and have the date the **Tract Database** was updated in the upper right hand corner and is a ”header” function of the word application. All of the information is important and must be updated at least annually, usually in late July or early August before annual billing is started. The Tract No. is the DWR Tract number and is not an official part of the decree. If it is a dashed number, it represents a tract split because of a parcel split or lot line adjustment. The Tax Code is maintained by the County.

There may be one or more Parcel Numbers, which are Assessor’s Parcel Numbers. If there is no Parcel Number, it is usually because the property is owned by a municipality

or the State or federal government. County Assessor's Offices often do not assign APNs to these parcels because they do not generate taxes for the County. In this case, the parcel will be under Direct Billing and will be sent a bill by DWR. Sometimes land has a parcel number and is billed directly. If an APN exists, include it for reference.

A tract or sub-tract may have several APNs. This only occurs if there are two or more contiguous parcels with the same owner. If one of the parcels sells, then a new sub-tract will be assigned and a new **control card** created.

The Billing CFS is the water right or subdivided water right, in cubic feet per second, which the water right holder is billed, calculated to three (3) places to the right of the decimal point. This may include water rights of several priorities. The Watermaster verifies that the field schedule matches the **control card**. The hierarchy of controlling documents is: 1) Decree; 2) **Control Card**; 3) Field Schedule.

NAME includes first and last name of the land parcel owner, according the County, in the first line. The following lines are the mailing address listed by the County.

The Decreed Name, County and Creek come from the decree and do not change.

Notes are for the use of the Watermaster. Most notes will be kept in the Tract Management Sheets. **Tract Database** notes are not intended to be comprehensive notes explaining the history of parcel splits, adjustments and corrections of water rights, and so on. Notes should include the math of a water right split, necessary information concerning a parcel split, information regarding correction of incorrect water rights, and any rationale that the Billing CFS differs from the field schedule.

Each year before Watermaster Billing, the **Tract Databases** are printed as **Control Cards** and put into **Blue Binders**. These are taken to the appropriate County Assessor's Offices and **control cards** are updated by the Watermaster. Otherwise, the **Blue Binders** stay in the Northern District Office. Each **Blue Binder** contains all of the **control cards** for a particular Watermaster Service Area, in alphabetical order of last name. At the Assessor's Office, the Watermaster confirms or changes the Tax Code, Parcel No. (Assessor's Parcel Number, or A.P.N.), Name, and address that is listed below the Name. Each update is done using ***red ink*** and is initialed by the Watermaster so that changes are easy to see. Any additional writing (even initials) could require clarification.

Every Tract and sub-tract has a unique water right amount, so each uniquely numbered Tract must have its own entry in the **Tract Database** which will print out as a unique **control card** page. This is necessary regardless of whether the parcel in that Tract is owned by a party that already owns other parcels in other Tracts. Rows in the **Tract Database** must be added whenever there is a parcel split and subsequent water right split. The Watermaster usually creates a new, handwritten **control card** and inserts it in the **Blue Binder** in alphabetical order. Once a year, soon after billing, the **Tract Databases** are updated to include all handwritten edits, and reprinted. The new

control cards are placed in the appropriate **Blue Binders**, and the old **cards** are bound together and kept for one year. After one year, the old **control cards** are thrown away.

County Assessor's Offices ask that each water user receive only one tax bill for Watermaster Service, on one ownership parcel. Therefore, water rights under the same ownership in differing Tracts could have the total water right combined in one **Tract Database** row (usually for billing purposes) provided that remarks appropriate to indicate the original water right amount for each Tract or sub-tract is entered into the note portion of the **Tract Database** row for the impacted Tracts. The proper method for this is to place an asterisk next to the billing cfs total on both **Tract Database** rows indicating the change explained in the corresponding note. If the water rights are not combined on **Tract Database** row with associated asterisks and explanatory notes, then water rights will be combined in the Excel billing spreadsheets at the time of billing. The preference is to have one **Tract Database** row for each tract or sub-tract, regardless of ownership.

Tract Database rows must be checked against the field schedules at least once a year, typically at budgeting time (first half of June per the California Water Code) or billing time (first half of August per CWC). The Watermaster must check to see that there is a field schedule entry for each **Tract Database** row / **Control Card**, or one field schedule entry for each tract and sub-tract on a combined **Tract Database** row / **Control Card**. The field schedule information must be the same as that on the **control card**, or else the field schedule values must be changed to match the **Tract Database** row / **Control Card**. Comparisons of the **Tract Database** row / **Control Card** vs. the field schedule AND field schedule vs. the **Tract Database** row / **Control Card** insures that no extraneous or erroneous information exists.

FIELD SCHEDULES

Field schedules are summaries of all of the water rights from the original court decree (or agreement) for every current water right owner. This summary is a "portable" record of water right amounts legally recognized in the decree and that are available for distribution at the 100% availability level. The field schedule is an Excel spreadsheet which in addition to organizing uniquely owned water rights, also has the functionality to perform various calculations.

Example of a Watermaster **Field Schedule**:

					Surprise Valley WMSA
					Cottonwood Creek
					Page 1 of 1
					Updated 05-02-06 MEF
		COTTONWOOD CREEK			
		(Decree 6903)			
DWR Tract	**Present Owner**	**Decreed Owner**	**Percent of Total Flow**	**Percent Below Auto-Split**	**Continuous for Billing Purposes 5/**
247 /3	Stevenson, J.	Archer, T.	6.00	0.00	1.200
248 /3	Carroll, R.	Laxague, G.	0.54	0.00	0.108
242 /2 /3 /4	Goodwin, D.	Goodwin, D. & A.	12.53	13.41	2.506
243 /1 /2 /3 /4	Cockrell, W. (Will)	Harris, E. & R.	47.55	50.88	9.510
244-1 /2	Masini Inv.	Cockrell, W. & B.	6.01	6.43	1.202
244-2 /2	Cockrell, W. (Bill)	"	12.03	12.87	2.406
		Tract 244 subtotal	18.04	19.30	3.608
245 /1	Shultz, O.	Coops, D. & R.	4.18	4.47	0.836
246 /1 /2	Stevenson, J.	Rosendahl, D.	5.58	5.97	1.116
109 /1	Cockrell, W. (Bill)	Cockrell, W. & B.	5.58	5.97	1.116
		TOTAL	100.00	100.00	20.000

Notes: 1.) Tracts 243, 245, 246, and 109 rotate their total allotments (62.89%) starting after April 1 as determined by the owners of Tracts 245, 246, and 109 according to the following schedule:

Minto Ditch (Tracts 245, 246, and 109) - 3 days
Main channel (Tract 243) - 9 days

Repeat rotation until nearest to July 1, then a final rotation of 6 days to Minto Ditch.

2.) After rotation ends (July 6 +/-), all water below auto-split for Tracts 247 and 248 will be divided as follows (see paragraph G of rotation agreement):

DWR Tract	Present Owner	Percent of Flow
242	D. Goodwin	13.41
243	W. Cockrell (Will)	67.29
244-1	Masini Inv.	6.43
244-2	W. Cockrell (Bill)	12.87
	TOTAL	100.00

3.] Auto-split for Tracts 247 and 248 will be closed when water no longer reaches County Road 1A.

4.] Tract 242 water (12.53% of total) will be measured at underground pipe. Ditch loss will be subtracted fromTract 243.

5.] Watermaster billing is based upon a total flow of 20 cfs.

Each **field schedule** consists of numerous rows of information separated into columns. At the base of the column showing calculated water right amounts is a sum total of all of the water rights. Every column showing a priority class of water rights will have a summed total at the bottom of that column. If there is more than one priority class there will also be, in addition to the sum for that priority class, a running total of water rights which includes the total of the preceding class added to the next succeeding priority class. The summed total water rights shown on the field schedules must accurately agree with the total from the decree. This is essential for both the individual priority class and the total of all water right classes under decree.

Water rights are shown to two (2) places after the decimal point (hundredths of a cfs). This provides more accuracy than can be measured by field practices, as well as reducing the potential for misreading a number.

The summed total water rights will remain the same from year to year unless there is a valid reason for them to change. Such reasons may include a water user working with the Superior Court to amend the decree for more or less water rights (including abandonment), or a **field schedule** being found in error in representing the water rights in the decree. If the summed total changes, it may be necessary to temporarily format the cells to three or four decimal places to reduce displayed rounding effects in the spreadsheet.

Each **field schedule** has centered at the top a title which identifies the **field schedule** by river/creek name. Underneath the title (in parenthesis) is listed the decree number and schedule as references to authenticate the information shown on the **field schedule.** In the upper right hand corner of the spreadsheet in one cell should be the name of the creek/river, below that the page number (if multiple pages), below that your initials with the date when the **field schedule** was last updated.

Typical column headings are DWR Tract; Present Owner; Decreed Owner; Diversion Number and Name; Water Right Amount.

Each water right on the **field schedule** is identified by a unique DWR Tract number. A Tract number is unique and is associated with only one original decreed water right owner; the Tract numbers for each original decreed owner have already been established. Example: original decreed owners; McClellan (Tract 99); Mapes (Tract 109); and Fleming (Tract 111). Similar Tract numbers are currently used as identifiers on existing field schedules and control cards, they will continue to be used indefinitely. “Sub-tracts” are those originally decreed Tracts that have been subdivided (split) by title transfer or that have been re-paged by the county assessor. Example: The original Tract 99 could have been subdivided (split) multiple times and would have multiple assessor parcel numbers which would describe a number of uniquely owned parcels. Each of the parcels containing any portion of the originally decreed lands will have a unique Tract or sub-tract number.

If there are subdivisions of any Tract into multiple sub-tracts, there should be a subtotal for the sub-tract at the bottom of that column for that sub-tract. Remember when summing the total water rights for a column of decreed water rights at the bottom of the **field schedule** that the intermediate subtotals must not be included in the final summation. Occasionally there will be additional information from the decree that does not fit a spreadsheet format. In these instances a footnote number (**1/, 2/, 3/**) should be added where appropriate. A corresponding text note sufficient to explain additional information should be placed at the end of the **field schedule** with the associated footnote number.