CORNING WATER DISTRICT

WATER MANAGEMENT PLAN
2008 CRITERIA

CORNING WATER DISTRICT
Water Management Plan
2008 Criteria

Date of first draft – 12/10/2009
Date of final – (12/31/2009)

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Section 1: Description of the District

District Name:	***CORNING WATER DISTRICT***
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A. History

Corning Water District was formed in June 1954 and originally comprised an area from Gyle Road on the north, the Southern Pacific Railroad on the east and extending approximately seven miles west and four miles south of Corning Road. Due to water distribution problems, the northern portion of the district was separated into what is now known as Thomes Creek Water District. The resulting boundary change left Corning Water District with Approximately 17,000 acres within the boundaries and approximately 14,000 acres considered irrigatable. For the first six years small amounts of water were delivered by temporary pumps and siphons to a few canal-side properties.

In 1989, by mutual agreement between the United States Bureau of Reclamation and Corning Water District, the official District acreage was changed from 14,000 acres to 11,075 acres. The original 14,000 acres represented the total acreage within the district boundaries of which some acreage was non-obligated, non-eligible lands. The final adjustment documented each obligated/eligible parcel of land within the District boundary.

The 11, 075 acres were all irrigatable and eligible to receive district water. The original irrigated acres totaled 3,000. When the District was first formed, much of the lands were farmed using ground water. The area, now within district, began to experience a decline in groundwater pumping levels. Once the District began to provide irrigation deliveries, primarily flood irrigation, the groundwater levels recovered. The original irrigated acreage included a significant acreage planted to permanent crop (primarily flood irrigated olives). Landowners have continued to covert district lands to permanent crops. The acres irrigated with CVP water increased to a historical high of 7,500 acres. In 2008 the District's irrigated acreage had declined to 7,338 irrigated acres.

Since the Districts formation, growers have significantly improved their on-farm water delivery systems. Where practical, water delivery for permanent crops has been converted from flood irrigation to low volume drip or sprinkler irrigation. Drip or sprinkler irrigation was utilized on 5,882 district acres.

In 1963 Corning Water District entered into a contract with the Bureau of Reclamation to build the water distribution facilities. The system included four canal-side pumping plants, two lift stations with regulating reservoirs, pipelines, and meters.

In early 1967 the distribution system construction was completed and water deliveries began that spring. The system had 341 delivery outlets and a water contract with Bureau of Reclamation for 25,300 acre-feet annually.

Corning Water District in late 1998 permanently relinquish its entitlement to 2,300 Acre-feet of Contract Supply to the United States in exchange for payment of accumulated interest and non-interest bearing Operation and Maintenance Deficits through Federal Fiscal Year 1997. The 2,300 acre-feet is used to increase the supply of water available to meet fish and wildlife purposes authorized by CVPIA.

*1. **Date district formed:*** **1954** *Date of first Reclamation contract:* **August 1957**
Original size (acres): **14,000** *Current year 2008:* **10,885** ***Acres***

2. Current size, population, and irrigated acres

	2008
size (acres)	11,041
population served	586
irrigated acres	7,338

3. Water supplies received in current year

Water Source	*AF*
Federal urban water (Tbl 1)	0
Federal agricultural water (Tbl 1)	11,578
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	0
Upslope drain water (Tbl 1)	0
District ground water (Tbl 2)	0
Banked water (Tbl 1)	0
Transferred water (Tbl 6)	1,726
Recycled water (Tbl 3)	0
Other (define) (Tbl 1)	0
Total	13,304

4. Annual entitlement under each right and/or contract

	AF	*Source*	*Contract #*	*Availability period(s)*
Urban AF/Y	N/A			
Agriculture AF/Y	23,000	CVP	14-06-200-6575-LTR1	Mar-Feb
Other AF/Y				
Other AF/Y				

5. ***Anticipated land-use changes*** The District does not anticipate any significant land-use changes within the next five years.

6. ***Cropping patterns***

List of current crops (crops with 5% or less of total acreage) can be combined in the 'Other' category.

Original Plan (1994)		***2003***		***2008***	
Crop Name	*Acres*	*Crop Name*	*Acres*	*Crop Name*	*Acres*
OLIVES	2,501	OLIVES	3,095	OLIVES	2,979
PASTURE	1,341	PASTURE	832	PASTURE	795
ALMONDS	604	ALMONDS	914	ALMONDS	1,519
RICE	596	RICE	132	RICE	230
PRUNES	512	PRUNES	567	PRUNES	549
ALFALFA		ALFALFA	88	ALFALFA	110
MISC.				WALNUTS	649
misc. (<5%)	377	misc. (<5%)	509	misc. (<5%)	507
TOTAL	**5,931**	TOTAL	**6,137**	TOTAL	**7,338**

7. ***Major irrigation methods (by acreage)***

Original Plan (1994)		*2003*		*2008*	
Irrigation Method	*Acres*	*Irrigation Method*	*Acres*	*Irrigation Method*	*Acres*
N/A		DRIP	2,848	DRIP	5,013
		SPRINKLER	1,425	SPRINKLER	651
		FLOOD	1,864	FLOOD	1,674
TOTAL		TOTAL	**6,137**	TOTAL	**7,338**

B. Location and Facilities

See Attachment A (District Facilities Map) for points of delivery, turnouts (internal flow), and outflow (spill) points, grower measurement locations, conveyance system, and regulation facilities.

1. ***Incoming flow locations and measurement methods*** (*See Attachment A*)

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
C-4 PUMP STATION	Corning Canal @ Gallagher Ave	Venturi	95%
C-6 PUMP STATION	Corning Canal @ Chittenden Ave	Venturi	95%
C-10 PUMP STATION	Corning Canal, South of Rawson	Venturi	95%
C-11 PUMP STATION	Corning Canal @ Liberal Ave	Venturi	95%

2. Current year Agricultural Conveyance System

Miles Unlined - Canal	*Miles Lined - Canal*	*Miles Piped*	*Miles - Other*
None	None	62 Miles	None

~~*3 Current year Urban Distribution*~~

4. Storage facilities (tanks, reservoirs, regulating reservoirs (See Attachment A)

Name	*Type*	*Capacity (AF)*	*Distribution or Spill*
A Tank	Open Top Steel Tank	.36	Regulating Tank
B Tank	Open Top Steel Tank	.47	Regulating Tank
C Tank	Open Top Steel Tank	.51	Regulating Tank
C-5 Reservoir	Concrete lined Regulating Reservoir	1.62	Regulating Reservoir
C-7 Reservoir	Concrete lined Regulating Reservoir	1.57	Regulating Reservoir
TOTAL		4.53	

As noted above, the distribution system has little or no storage capability. However, the 22 mile long Corning Canal, operated by the Tehama Colusa Canal Authority, by its nature, has some off-stream storage capacity between Red Bluff Diversion Dam and the District's canal-side pump stations.

5. Outflow locations and measurement methods
See Section 2 F below.

6. Description of the agricultural spill recovery system

Corning Water District's distribution system is a closed pressure system and completely piped, therefore, use operational spills. There are, however, emergency overflows on each of the regulating tanks and reservoirs. Overflows seldom occur, and it they do the operating system provides alarms to the on-call system operator. The new SCADA control system has a redundant pump shut down system to help assure that the regulating structures do not over flow.

The District's C-10 pump station, lateral 18.8, does not have a regulating structure that would allow the pumping station to be fully automated. The pump station is equipped with an overflow standpipe that will return unused water back into the Corning Canal. Since the SCADA automation system was installed, return flows have been reduced by approximately 70%.

When any of the pump stations are shut down for the winter or for maintenance, a portion of water in the distribution system is drained back to the Corning Canal, and the remainder stays in the distribution pipeline. None is released to a spill.

7. Agricultural delivery system operation

On-demand	*Scheduled*	*Rotation*	*Other (describe)*
X			

8. Restrictions on water source(s)

Source	*Restriction*	*Cause of Restriction*	*Effect on Operations*
CVP	RED BLUFF DIVERSION DAM GATE OPERATIONS	Fish passage issues	Creates water shortage and water delivery allocation
CVP	WATER CONTRACT SHORTAGE PROVISIONS	Instream flow requirements and drought conditions	Creates water shortage and water delivery allocation

9. Proposed changes or additions to facilities and operations for the next 5 years

The District would like to complete the SCADA system installation by including the C-11 Pump Station. Operational control of the distribution system has been significantly improved with the SCADA installations at C-10, C-4, C-5, C-6 and C-7.

The installation of variable frequency drive units at C-10 would further reduce power consumption and improve the uniformity of distribution by maintaining consistent delivery pressures. District staff will continue to investigate the possibility of installing variable frequency drive units at all the pump stations.

C. Topography and Soils

1. Topography of the district and its impact on water operations and management

The topography of the District ranges from flat to gently rolling. Elevation changes are gradual. Most class 2 and class 3 areas slope 3 to 5 percent and are considered irrigable. The impact of the topography on district irrigation practices is negligible due to the original design of the distribution system. The impact of the hilly terrain is offset by the use of micro irrigation delivery systems.

2. District soil association map
See Attachment B, District Soils Map

3. Agricultural limitations resulting from soil problems

Soil Problem	*Estimated Acres*	*Effect on Water Operations and Management*
Gravely Clay Topsoil-hilly	1,244	Requires Micro irrigation systems, more crop inputs, portion not irrigated
Heavy Clay Soils	500	Requires Micro irrigation systems

D. Climate

1. General climate of the district service area

The District's climate is generally mild and semi-arid. Corning, CA climate is hot during summer when temperatures tend to be in the 90's and cold during winter when temperatures tend to be in the 40's.

The warmest month of the year is July with an average maximum temperature of 97.60 degrees Fahrenheit, while the coldest month of the year is December with an average minimum temperature of 37.10 degrees Fahrenheit.

Temperature variations between night and day tend to be relatively big during summer with a difference that can reach 32 degrees Fahrenheit, and fairly limited during winter with an average difference of 19 degrees Fahrenheit.

The annual average precipitation at Red Bluff is 24.07 Inches. Winter months tend to be wetter than summer months. The wettest month of the year is January with an average rainfall of 4.82 Inches.

During the spring, early summer, and fall, a dry north wind can blow for extended periods reducing available soil moisture and increasing water demand

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
Avg Precip.	4.4	3.7	2.9	1.6	1.1	.46	.07	.14	.47	1.4	2.9	4.0	23.19
Avg Temp.	45.9	50.1	53.9	59.4	67.8	75.9	81.6	79.6	74.8	64.8	53.1	46.6	62.8
Ave Max. Temp.	54.7	59.9	64.9	71.9	81.7	90.4	97.9	96	90.6	78.7	63.7	55.3	75.5
Ave Min. Temp	37	40.2	43	46.8	53.9	61.3	65.6	63.1	58.9	50.9	42.5	37.9	50.1
ETo													

Weather station ID 047292 Red Bluff FSS *Data period: Year 1933 to Year* 2009

Average wind velocity 5-15 MPH *Average annual frost-free days:* 340

2. Impact of microclimates on water management within the service area

The District covers a relatively small geographical area, and does not have distinct or separate climate zones. Dry north winds have a dramatic effect on water consumption, but the effects, as with other climatic conditions, are uniform throughout the District.

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	*Estimated Acres*	*Description*
NONE		

2. Description of district management of these resources in the past or present

NONE

3. Recreational and/or cultural resources areas within the service area

Name	*Estimated Acres*	*Description*
NONE		

F. Operating Rules and Regulations

1. Operating rules and regulations

See Attachment C, District Rules and Regulations (water related)

2. Water allocation policy, Agricultural Water

See Attachment E, & Attachment C, Page 2,

Summary – The District currently assesses 10,774 acres annually for Operations and Maintenance and Debt Repayment. Each assessed acre is offered and is entitled to an equal share of the District's contract supply from the Bureau of Reclamation's Central Valley Project, or any other water acquired by the District. Any water that is not purchased by an eligible land owner will be reallocated per acre to land owners whose water orders were not filled by the original allocation. Each land owner may transfer his/her allocation.

The District's Board of Directors may require that water users order and pay for water, in advance, that is purchased from other sources. If such water orders exceed available supply for purchase, the water will be allocated per assessed acre for those growers having ordered and paid in advance.

3. Official and actual lead times necessary for water orders and shut-off

See Attachment C, Page 3

Summary –The District asks growers to provide 24-hour notice of irrigation start time, stop time, and gallons per minute. This information is ultimately used to generate a water order for the Tehama-Colusa Canal Authority. They in turn use the water orders for daily operations at Red Bluff Diversion Dam. Growers, however, are given some flexibility to encourage timely water use, and growers are not held to the specific shutoff time. Grower can submit a weekly or monthly irrigation schedule and modify it as needed to meet the Eto requirements.

*4. **Policies regarding return flows (surface and subsurface drainage from farms) and outflow***
See Attachment C, Page 4

Summary – The District recognizes that a small amount of discharge water may occur when utilizing flood irrigation and therefore encourages the installation of recirculating structures and capture ponds, and promotes the reuse of tail water wherever possible. Water users that consistently waste water may be allowed a reasonable amount of time to correct the problem, however, if the problem is not promptly corrected water service will be discontinued by the District.

5. Policies on water transfers by the district and its customers
See Attachment E Corning Water District Allocation and Transfer Policy attached.

Summary – Current policy allows water transfers to other TC districts provided all water needs within the District are satisfied. Water transfers into the District from other water rights holders are addressed on a case by case basis. Landowners may transfer their water allocation to other landowner anywhere within the District and receiving service from the District's distribution system.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

a. Number of farms 493

b. Number of delivery points (turnouts and connections) 344

c. Number of delivery points serving more than one farm 26

d. Number of measured delivery points (meters and measurement devices) 344

e. Percentage of delivered water that was measured at a delivery point 100%

f. Delivery point measurement device table

Measurement Type	*Number*	*Accuracy (+/- %)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
Orifices	0				
Propeller meter	274	7%	30		60
Weirs	0				
Flumes	0				
Venturi	0				
Metered gates	0				
Acoustic Doppler	0				
Turbine Low Flows	70	5%	30		60
Total	344				

The District will rebuild the high use meter each year. The process includes the replacement of all bushings, bearings, and gear clusters, and any other parts that appear worn or damaged. The district

maintains a supply of rebuilt meters, and meters that have a problem during the irrigation season will be replaced immediately.

~~***2. Urban Customers***~~

3. Agriculture and Urban Customers

a. ***Current year agriculture water charges - including rate structures and billing frequency***

The water rate for 2009 is $45 per acre-foot for Ag Water, and $114 for M&I Water.

b. ***Annual charges collected from customers (2009 data)***

Fixed Charges – determined by acre, etc.			
$	*per acre, etc.*	*Units billed per year*	*$ collected per year*
$7.40	Per acre	10,775	$79,740
$10.41	Per acre	10,775	$112,160
		TOTAL	$191,900

Volumetric charges 2009 data			
Charges ($ unit)	*Charge units ($ per AF, etc.)*	*Units billed during year (AF, etc.)*	*$ collected ($ times units)*
$45	$/AF	8,743	$393,435
$114	$/AF	3	$342
		TOTAL	$393

See Attachment D, District Sample Bills

Water-use data accounting procedures The District reads water meters around the 26th of each month during the irrigation season. It takes the districts meter reader three and a half days to record each reading on a meter route sheet.

Office staff enters the meter readings into the agricultural water billing software program call H2O Pro. The software calculates the water usage and generates management reports and grower reports. The management reports are reviewed by comparing usage to water orders, standard application rates, ET requirements, and historical use for like crops.

Once the management usage reports have been confirmed, the reports are used to create billing invoices in the District's accounting software. Billing statements are printed and mailed around the 10th of each month. The statement includes all charges owed including assessments, water, penalties & interest, and miscellaneous charges. The statement mailing includes the grower reports which detail the water usage for each turnout. The reports also include previous and current meter readings, current usage, year to date usage, and adjustments for each turnout. The reports provide the grower with the total acreage, total water allocation, total usage, and remaining water allocation.

Staff prepares a binder each month with hard copies of meter reading route sheets, the F6 management usage report, the grower total usage report, adjustment sheets, and the QuickBooks detailed water sales report.

H. Water Shortage Allocation Policies

1. Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated

See Attachment E, District Water Shortage Plan

Water Allocation Policy. It is the Policy of the Corning Water District to fairly allocate the District's entire water supply based on assessed acreage. Each year, before any water is delivered, each water user must submit an application indicating the total amount of water the applicant estimates will be required for the ensuing crop year. If the estimated water supply exceeds the estimated water usage, each grower will receive 100% of the water requested on their application.

If water orders exceed supply, the supply will be allocated to each land owner based on their assessed district acreage. Once the shortage has been declared by the board, a letter is sent to each landowner notifying them of the quantity of project water that will be available. The landowner has three choices, they can submit an application for their allocated supply, they can transfer their allocation to another landowner, or they can return their allocation to the district. The landowners are asked to place their order for the full amount of the crop requirement, even if the quantity exceeds the amount available under the initial allocation procedure. The water that is returned to the district will be allocated, again by acre, to help fill unmet demand.

The district will try to purchase additional water to help fill the unmet demand caused by the water shortage. Additional water is generally more expensive than the district's contract water, therefore, landowners are given the option to order the additional water before it is purchased by the district. The district will only purchase the additional water quantities equal to the amount of the additional water ordered and paid for by landowners.

2. Current year policies that address wasteful use of water and enforcement methods

See Attachment C, Rules and Regulations, Page 4

Section 2: Inventory of Water Resources

A. Surface Water Supply

1. Acre-foot amounts of surface water delivered to the water purveyor by each of the purveyor's sources

See Water Inventory Tables, Table 1

2. Amount of water delivered to the district by each of the district sources for the last 10 years

See Water Inventory Tables, Table 8

B. Ground Water Supply

1. Acre-foot amounts of ground water pumped and delivered by the district

See Water Inventory Tables, Table 2 Corning Water District does not own or operate any groundwater wells.

2. Ground water basin(s) that underlies the service area

Name	*Size (Square Miles)*	*Usable Capacity (AF)*	*Safe Yield (AF/Y)*
Sacramento Valley Groundwater Basin, Corning Sub basin 5-21.51	321	2,752,950	

3. Map of district-operated wells and managed ground water recharge areas

Name	***Date Drilled***	***Capacity (gpm)***	***Depth (ft)***	***Pump Depth (ft)***	***Spring Static Water Level (ft)***	***Pumped Water Level (ft)***
NONE						

4. Description of conjunctive use of surface and ground water Corning Water District does not have a defined conjunctive use program. However, Table 2 shows that there is a significant amount of groundwater utilized by private landowners.

5. Ground Water Management Plan

See Attachment G, Corning Water District is signatory, by Board approved Memorandum of Understanding, to the TEHAMA COUNTY GROUNDWATER MANAGEMENT PLAN. Please see the CD attached.

6. Ground Water Banking Plan

Corning Water District does not have a "Ground Water Banking Plan".

C. Other Water Supplies

1. "Other" water used as part of the water supply
See the Water Inventory Tables, As illustrated in Table 1, Corning Water District does not utilize any "other" sources of water.

D. Source Water Quality Monitoring Practices

~~*1. Potable Water Quality*~~

2. Agricultural water quality concerns: *Yes* _____ *No* X
(If yes, describe)

3. Description of the agricultural water quality testing program and the role of each participant, including the district, in the program The District has no water quality testing program.

4. Current water quality monitoring programs for surface water by source

Analyses Performed	*Frequency*	*Concentration Range*	*Average*
NONE			

Current water quality monitoring programs for groundwater by source

Analyses Performed	*Frequency*	*Concentration Range*	*Average*
NONE			

E. Water Uses within the District

1. Agricultural
See Water Inventory Tables, Table 5 - Crop Water Needs

2. Types of irrigation systems used for each crop in current year

Crop name	*Total Acres*	*Level Basin - acres*	*Furrow - acres*	*Sprinkler - acres*	*Low Volume - acres*	*Multiple methods - acres*
OLIVES	2,979	43		115	2,821	
ALMONDS	1,519	40		125	1354	
WALNUTS	649			360	289	
PRUNES	549		179	48	322	
IRRIGATED PASTURE	795	795				

CORN	109		109			
ALFALFA	110	110				
SUDAN	40	40				
RICE	230	230				
EUCL	106				106	
WETLANDS	128	128				
FIGS	116				116	
BLUEBERRIES	5				5	
ORANGES	3			3		
	0					
All other crops	0					
Crop Acres	7,338	1386	288	651	5013	

~~*3. Urban use by customer type in current year*~~

~~*4. Urban Wastewater Collection/Treatment Systems serving the service area – current year*~~

5. Ground water recharge/management in current year *(Table 6)*

Recharge Area	*Method of Recharge*	*AF*	*Method of Retrieval*
NONE			
	Total		

6. Transfers and exchanges into or out of the service area in 2008 *(Table 6)*

From Whom	*To Whom*	*AF*	*Use*
Reclamation District 108	Corning Water District	1,500	Agricultural
Sutter Mutual Water Co.	Corning Water District	300	Agricultural
CWD Grower Nerey	Orland-Artois Water District	65	Agricultural
CWD Grower	Colusa County Water District	9	Agricultural

7. Trades, wheeling, wet/dry year exchanges, banking or other transactions in current year *(Table 6)*

From Whom	*To Whom*	*AF*	*Use*
None			

8. Other uses of water in current year

No Other Uses	*AF*

F. Outflow from the District

Districts included in the drainage problem area, as identified in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (September 1990)," should also complete

See Facilities Map, Attachment A, for the location of surface outflow points.

1. Surface and subsurface drain/outflow in current year

Outflow point	*Location description*	*AF*	*Type of measurement*	*Accuracy (%)*	*% of total outflow*	*Acres drained*
	NONE					

Outflow point	*Where the outflow goes (drain, river or other location)*	*Type Reuse (if known)*
	NONE	

2. Description of the Outflow (surface and subsurface) water quality testing program and the role of each participant in the program The District has no water quality testing program.

3. Outflow (surface drainage & spill) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None				

Outflow (subsurface drainage) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None				

4. Provide a brief discussion of the District's involvement in Central Valley Regional Water Quality Control Board programs or requirements for remediating or monitoring any contaminants that would significantly degrade water quality in the receiving surface waters. Testing that has been conducted as required for the Ag Discharge Waiver has not identified any conditions that require continued monitoring.

G. Water Accounting (Inventory)

1. Water Supplies Quantified

a. Surface water supplies, imported and originating within the service area, by month (Table 1)
b. Ground water extracted by the district, by month (Table 2)

c. *Effective precipitation by crop (Table 5)*
d. *Estimated annual ground water extracted by non-district parties (Table 2)*
e. *Recycled urban wastewater, by month (Table 3)*
f. *Other supplies, by month (Table 1)*

2. *Water Used Quantified*

a. *Agricultural conveyance losses, including seepage, evaporation, and operational spills in canal systems (Table 4) or*
~~*Urban leaks, breaks and flushing/fire uses in piped systems (Table 4)*~~
b. *Consumptive use by riparian vegetation or environmental use (Table 6)*
c. *Applied irrigation water - crop ET, water used for leaching/cultural practices (e.g., frost protection, soil reclamation, etc.) (Table 5)*
~~*d. Urban water use (Table 6)*~~
e. *Ground water recharge (Table 6)*
f. *Water exchanges and transfers and out-of-district banking (Table 6)*
g. *Estimated deep percolation within the service area (Table 6)*
h. *Flows to perched water table or saline sink (Table 7)*
i. *Outflow water leaving the district (Table 6)*
j. *Other*

3. *Overall Water Inventory*
a. *Table 6*

H. Assess Quantifiable Objectives:

CALFED Water Use Efficiency Program goals as identified for the Corning Water District.

QO #	*QO Description*	*Past, Present & Future Plans*
9	Antelope Creek, provide flow to improve ecosystem conditions	No future plans, see note below
10	Deer Creek, provide flow to improve ecosystem conditions	No future plans, see note below
11	Mill Creek, provide flow to improve ecosystem conditions	No future plans, see note below
12	Paynes Creek, provide flow to improve ecosystem conditions	No future plans, see note below
13	Sacramento River below Keswick, provide flow to improve ecosystem conditions	No future plans, see note below
14	Elder Creek, reduce Pesticides to enhance and maintain beneficial uses of water.	No future plans, see note below
15	Sacramento River, reduce Pesticides to enhance and maintain beneficial uses of water.	Continue to evaluate programs to minimize pesticide applications.
16	Deer Creek, reduce Temperatures to enhance and maintain aquatic species populations	No future plans, see note below
17	Mill Creek, reduce Temperatures to enhance and maintain aquatic species populations	No future plans, see note below

9-#13 All the Sacramento River tributaries listed in the Quantifiable Objectives for Corning Water District, except Elder Creek, enter the river from the east. Corning Water District and the Corning Canal are west of the Sacramento River and therefore unable to provide or exchange flows. No opportunities exist to exchange or enhance eastside flows by reducing diversions at Red Bluff Diversion Dam, because such flows would not address the most significant issue, which is stream flow enhancement in the lower stream reaches.

#14 Corning Water District does not apply pesticides in the Elder Creek watershed and therefore is unable to alter pesticide residues.

#15 Drainage from lands operated by the District eventually goes to the Sacramento River. The District has a limited weed control program wherein herbicides are used to achieve the desired control. The District will continue to monitor all pesticide applications to assure the right product is used at the correct time with the correct quantities.

#16 & #17 Corning Water District unable to affect any change in temperature for eastside creek flow.

Section 3: Best Management Practices (BMPs) for Agricultural Contractors

A. Critical Agricultural BMPs

1. ***Measure the volume of water delivered by the district to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/- 6%***
Corning Water District's water deliveries are all metered and have been since CVP water deliveries began. The District's primary issue is measuring low flows created by a conversion from flood irrigation to drip irrigation on permanent crops. To date, approximately 65 meters have been converted to more accurately measure lower flows. District staff closely monitors all drip application to see that the meter usage is consistent with the usage of growers using smaller meters. Turnouts that are consistently under usage averages are adjusted and targeted for meter replacement. Each year three to five meters are converted. Under the Districts meter maintenance program all high use meters are checked weekly and rebuilt at the end of each year. In addition approximately ten meters are rebuilt annually.

Number of turnouts that are unmeasured or do not meet the standards listed above: 0

Number of measurement devices installed last year: 3

Number of measurement devices installed this year: 3

Number of measurement devices to be installed next year: 3

Types of Measurement Devices Being Installed	*Accuracy*	*Total Installed During Current Year*
3" Turbine Meters Convert large meters to smaller meters due to grower conversion from flood to drip	+/- 5%	2

2. ***Designate a water conservation coordinator to develop and implement the Plan and develop progress reports***

Name: JAMES G. LOWDEN *Title:* MANAGER

Address: *P.O. Box 738, Corning, CA, 96021*

Telephone: 530-824-2914 *E-mail:* corningwd@tehama.net

3. ***Provide or support the availability of water management services to water users***
See Attachment J, Notices of District Education Programs and Services Available to Customers.

a. On-Farm Evaluations

1) On farm irrigation and drainage system evaluations using a mobile lab type assessment.

In 2002 Corning Water District, in cooperation with the Calif. Department of Water Resources, the University of California Cooperative Extension, and The Tehama County Resources Conservation District helped sponsor the formation of a local Mobil Irrigation Lab. The project continues to provide assistance to growers in Glenn and Tehama Counties. The District provides growers with contact information for the Mobile Irrigation Lab services.

	Total in district	*# surveyed last year*	*# surveyed in current year*	*# projected for next year*	*# projected 2nd yr in future*
Irrigated acres	7,338	Service unavailable	50	100	100
Number of farms	300		1	3	3

2) Timely field and crop-specific water delivery information to the water user
Since the District reads the meter only once a month, water users are encouraged to record start and stop meter readings for each irrigation event. This information, with the help of district staff if necessary, can be used to calculate an application rate in acre inches per hour. The information can then be used the weekly Et reports. The monthly billing statement includes a "Monthly Usage Report"

b. Real-time and normal irrigation scheduling and crop ET information
CWD, from time to time, includes copies of the CIMIS ET report with the monthly billing statement. These mailings are to promote awareness, however, once a month is not adequate for irrigation scheduling. Therefore, information that is received weekly from DWR via e-mail is posted in the District office. Copies are also available at the office.

c. Surface, ground, and drainage water quantity and quality data provided to water users
Corning Water District does not have a program to monitor water quality. The District has delivered irrigation water or the past 40 years and during that time no water quality issues have been identified. Normally this region of California does not require additional quantities of water to enhance soil quality. Since the Districts formation, the only water source has been the Sacramento River, which has consistent, good quality irrigation water. Water use and irrigation scheduling is not affected by water quality.

d. Agricultural water management educational programs and materials for farmers, staff, and the public

Program	*Co-Funders (If Any)*	*Yearly Targets*
Weekly Soil Moisture Loss Reports are Available to Corning Water District Water Users To Assist Farm Water Management	Calif Department of Water Resources, Calif Cooperative Extension	Mail info to each district grower

See Attachment J "Weekly soil moisture loss Reports are available to Corning Water District water users to assist on-farm water management". The handout was prepared to help growers relate the weekly soil moisture loss reports to the water use reports provided by with the District's billing.

When practical, District staff will participate with local school districts to provide water awareness programs. These presentations have targeted middle schools grades 5 through 8.

The educational emphases for the next five years will again be on developing a soil moisture monitoring program to help district growers improve irrigation scheduling techniques. District staff has installed several Watermark soil moisture data logger stations. The moisture data loggers measure soil tension (in centibars) at 12, 24, 42 and 66 inch depths. Currently the district is working with a grower and U.C. Cooperative Extension Service, to relate the centibar readings to plant stress by measuring midday stem water potential with a pressure chamber. It is hoped that his information will help the understanding of centibar reading as they relate to available moisture.

e. ***other*** The District will provide article on water use efficiency as billing inserts.

4. Pricing structure - based at least in part on quantity delivered

The District's goal for an incentive price program continues to be a price structure that discourages unreasonable water use, provides financial incentive to improve the grower's irrigation water delivery system, and improves on-farm water management. District staff and the Board of Directors will evaluate the pricing structure each year to determine if an incentive pricing program would further the stated goals. Past District water prices have been the highest in the Tehama-Colusa and surrounding service areas. The annual evaluations continue to indicate that the current pricing structure is sufficiently high to encourage grower investment in low volume water delivery systems and other on-farm improvements. The cost to growers to pump private groundwater supplies is generally less per acre foot than the cost district surface water, and therefore already promotes groundwater substitution and conjunctive water use. Consideration of an incentive price program will be part of the district's annual budget process.

5. Evaluate and describe the need for changes in policies of the institutions to which the district is subject

The Bureau of Reclamation needs to change their internal policy for implementation of the "area of origin" provision of California water law. A policy which applies water shortages equally to north valley and south of delta water users was clearly not the intent of the policy makers when Shasta Dam was built. Issues of gate operations at Red Bluff Diversion Dam are being address.

6. Evaluate and improve efficiencies of district pumps

The current program has each District pump evaluated every five years. Pumps operating at low efficiency will be evaluated for repair or replacement. Pumps should be tested again in the fall of 2010. Once tested a maintenance will be developed to address the least efficient pumps.

B. Exemptible BMPs for Agricultural Contractors

1. Facilitate alternative land use

Drainage Characteristic	*Acreage*	*Potential Alternate Uses*
High water table (<5 feet)	N/A	
Poor drainage	N/A	
Ground water Selenium concentration > 50 ppb	N/A	
Poor productivity	N/A	

2. Facilitate use of available recycled urban wastewater that otherwise would not be used beneficially, meets all health and safety criteria, and does not cause harm to crops or soils

Sources of Recycled Urban Waste Water	*AF/Y Available*	*AF/Y Currently Used in District*
No recycled urban waste water is available for district use, the closest waste water treatment plant is approximately 10 miles district facilities	N/A	0

3. Facilitate the financing of capital improvements for on-farm irrigation systems

It is the policy of the District to provide information on available loan and grant programs either in a newsletter or as a bill insert. District will continue to monitor the availability for grower incentive programs.

Funding source Programs	*How provide assistance*
No program currently in place	

4. Incentive pricing

Structure of incentive pricing	*Related goal*
Evaluated annually	

5. a) Line or pipe ditches and canals

Canal/Lateral (Reach)	*Type of Improvement*	*Number of Miles in Reach*	*Estimated Seepage (AF/Y)*	*Accomplished/ Planned Date*
Completed, all district facilities are lined or piped				

b) Construct regulatory reservoirs

Reservoir Name	*Annual Spill in Section (AF/Y)*	*Estimated Spill Recovery (AF/Y)*	*Accomplished/ Planned Date*
Completed			

6. Increase flexibility in water ordering by, and delivery to, water users
Completed-the district operates as an on-demand delivery system.

7. Construct and operate district spill and tailwater recovery systems
The entire distribution system is piped. The district has very few operational spills and little to no tailwater leaving the District boundaries and therefore has no plans to construct additional facilities.

Distribution System Lateral	*Annual Spill (AF/Y)*	*Quantity Recovered and reused (AF/Y)*
Total		

Drainage System Lateral	*Annual Drainage Outflow (AF/Y)*	*Quantity Recovered and reused (AF/Y)*
Total		

8. Plan to measure outflow.
No plan to measure outflows.

Total # of outflow (surface) locations/points _____
Total # of outflow (subsurface) locations/points _____
Total # of measured outflow points _____
Percentage of total outflow (volume) measured during report year _____

Identify locations, prioritize, determine best measurement method/cost, submit funding proposal

Location & Priority	*Estimated cost (in $1,000s)*				
	2009	*2010*	*2011*	*2012*	*2013*

9. Optimize conjunctive use of surface and ground water
The use of groundwater within the district currently accounts for over one third of the irrigated acreage. This has occurred as a result of the District's comparatively high cost of agricultural water. Wells that existed prior to the formation of the District, and wells drilled as a result of reduced surface water supplies during periods of drought such as 1976-77. These sources provide water at less cost than the District's contract supply. An intensive study done in 2003 by Camp Dresser & Mckee, Inc, in association with the California Department of Water Resources, Northern District, indicates a trend of declining groundwater levels within the district. These trends for been recently confirmed by newly installed multi-completion monitoring well drilled in the south portion of the District. In conclusion, district management feels that optimization has been achieved and maybe exceeded; therefore, the District has no plans to encourage additional conjunctive use programs. The conditions outlined herein will be monitored annually to assure adequate conjunctive water use continues.

10. Automate canal structures Completed, The District's canal side pump stations, lift stations, and

regulating facilities are all automated.

11. Facilitate or promote water customer pump testing and evaluation
See Attachment K, Notices of District Education Programs and Services Available to Customers
District will promote water customer pump tests by providing information on the pump test services available.

12. Mapping

GIS maps	*Estimated cost (in $1,000s)*				
	2009	*2010*	*2011*	*2012*	*2013*
Layer 1 – Distribution system					5,000
Layer 2 – Drainage system					
Suggested layers:					
Layer 3 – Ground water information					
Layer 4 – Soils map					
Layer 5 – Natural & cultural resources					
Layer 6 – Problem areas					

Corning Water District will work toward completing the mapping by 2013.

C. Provide a 3-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

BMP #		*BMP Name*	*Actual Expenditure (not including staff time)*	*Staff Hours*
A	*1*	*Measurement*	*$2,550*	*200*
	2	*Conservation staff*	*$500*	*45*
	3	*On-farm evaluation /water delivery info*	*$1,800*	*55*
		Irrigation Scheduling	*$200*	*31*
		Water quality	*$0*	*0*
		Agricultural Education Program	*$225*	*40*
	4	*Quantity pricing*	*$0*	*5*
	5	*Policy changes*	*$0*	*4*
	6	*Contractor's pumps*	*$975*	*60*
B	*1*	*Alternative land use*	$0	4
	2	*Urban recycled water use*	$0	16
	3	*Financing of on-farm improvements*	$0	2
	4	*Incentive pricing*	$0	4
	5	*Line or pipe canals/install reservoirs*	$0	0
	6	*Increase delivery flexibility*	$0	65
	7	*District spill/tailwater recovery systems*	$0	22
	8	*Measure outflow*	$0	0
	9	*Optimize conjunctive use*	$0	31
	10	*Automate canal structures*	$0	0
	11	*Customer pump testing*	$0	10

	12	*Mapping*	$0	4
		Total	**$6,200**	**604**

2. *Projected budget summary for the next year.*

BMP	#	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A	1	*Measurement*	*$3,000*	*250*
	2	*Conservation staff*	*$400*	*40*
	3	*On-farm evaluations/water delivery info*	*$500*	*75*
		Irrigation Scheduling	*$1,500*	*60*
		Water quality	*$0*	*0*
		Agricultural Education Program	*$1,000*	*40*
	4	*Quantity pricing*	*$0*	*16*
	5	*Policy changes*	*$0*	*8*
	6	*Contractor's pumps*	*$2,500*	*75*
B	1	*Alternative land use*	$0	8
	2	*Urban recycled water use*	$0	0
	3	*Financing of on-farm improvements*	$0	4
	4	*Incentive pricing*	$0	8
	5	*Line or pipe canals/install reservoirs*	$0	8
	6	*Increase delivery flexibility*	$500	24
	7	*District spill/tailwater recovery systems*	$0	30
	8	*Measure outflow*	*$0*	*8*
	9	*Optimize conjunctive use*	$0	8
	10	*Automate canal structures*	$0	0
	11	*Customer pump testing*	$0	8
	12	*Mapping*	$0	*8*
		Total	$9,400	678

3. *Projected budget summary for 3rd year.*

BMP	#	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A	1	*Measurement*	*$3,000*	*250*
	2	*Conservation staff*	*$400*	*40*
	3	*On-farm evaluations/water delivery info*	*$500*	*75*
		Irrigation Scheduling	*$1,500*	*60*
		Water quality	*$0*	*0*
		Agricultural Education Program	*$1,000*	*40*
	4	*Quantity pricing*	*$0*	*16*
	5	*Policy changes*	*$0*	*8*
	6	*Contractor's pumps*	*$2,500*	*75*

(continued)			*Budgeted Expenditure*	
BMP #		*BMP Name*	*(not including staff time)*	*Staff Hours*
B	*1*	*Alternative land use*	$0	8
	2	*Urban recycled water use*	$0	0
	3	*Financing of on-farm improvements*	$0	4
	4	*Incentive pricing*	$0	8
	5	*Line or pipe canals/install reservoirs*	$0	8
	6	*Increase delivery flexibility*	$500	24
	7	*District spill/tailwater recovery systems*	$0	30
	8	*Measure outflow*	*$0*	8
	9	*Optimize conjunctive use*	$0	8
	10	*Automate canal structures*	$0	0
	11	*Customer pump testing*	$0	8
	12	*Mapping*	$0	8
		Total	$9,400	678

~~Section 4: Best Management Practices for Urban Contractors~~

Year of Data	2008

Table 1

Surface Water Supply

2008 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (acre-feet)	Other Water (transfer) (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
Method							
January	20	0	0	0	0	0	20
February	15	0	0	0	0	0	15
March	151	0	0	0	0	0	151
April	1,077	0	0	0	0	0	1,077
May	1,955	0	0	0	1,500	0	3,455
June	2,160	0	0	0	0	0	2,160
July	2,083	0	0	0	0	0	2,083
August	1,986	0	0	0	0	0	1,986
September	1,330	0	0	0	0	0	1,330
October	524	0	0	0	300	0	824
November	71	0	0	0	0	0	71
December	206	0	0	0	0	0	206
TOTAL	11,578	0	0	0	1,800	0	13,378

Table 2

Ground Water Supply

2008 Month	District Groundwate (acre-feet)	Private Agric *(acre-feet)
Method		
January	0	0
February	0	15
March	0	250
April	0	560
May	0	925
June	0	1,175
July	0	1,380
August	0	1,050
September	0	825
October	0	310
November	0	0
December	0	0
TOTAL	0	6,490

*Private groundwater is estimated

Table 3

Total Water Supply

2008 Month	Surface Water Total (acre-feet)	District Groundwate (acre-feet)	Recycled M&I (acre-feet)	Total District (acre-feet)
Method				
January	20	0	0	20
February	15	0	0	15
March	151	0	0	151
April	1,077	0	0	1,077
May	1,955	0	0	1,955
June	2,160	0	0	2,160
July	2,083	0	0	2,083
August	1,986	0	0	1,986
September	1,330	0	0	1,330
October	524	0	0	524
November	71	0	0	71
December	206	0	0	206
TOTAL	11,578	0	0	11,578

*Recycled M&I Wastewater is treated urban wastewater that is used for agriculture.

Table 4

Agricultural Distribution System

2008 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
Mainline 48"	200	0	0	0.0	0.0	0	0	0
Mainline 42"	4,700	0	0	0.0	0.0	0	0	0
Mainline 39"	8,800	0	0	0.0	0.0	0	0	0
Mainline 36"	9,600	0	0	0.0	0.0	0	0	0
Mainline 33"	2,600	0	0	0.0	0.0	0	0	0
Mainline 30"	10,375	0	0	0.0	0.0	0	0	0
Mainline 27"	3,600	0	0	0.0	0.0	0	0	0
Mainline 24"	17,000	0	0	0.0	0.0	0	0	0
Lateral 21"	23,215	0	0	0.0	0.0	0	0	0
Lateral 18"	32,311	0	0	0.0	0.0	0	0	0
Lateral 15"	45,082	0	0	0.0	0.0	0	0	0
Lateral 12"	62,125	0	0	0.0	0.0	0	0	0
Lateral 10"	68,635	0	0	0.0	0.0	0	0	0
Lateral 8"	33,195	0	0	0.0	0.0	0	0	0
A Tank			379	0.2	0.0	15	6	(21)
B Tank			660	0.2	0.0	20	4	(24)
C Tank			572	0.2	0.0	0	2	(2)
Lateral 6"	5,685	0	0	0.0	0.0	0	0	0
C-7 Reservoir	102	62	6,324	0.3	1.0	0	0	(1)
C-5 Reservoir	105	65	6,825	0.3	1.0	0	0	(1)
TOTAL				1.2	2.0	35	12	46

Table 5

Crop Water Needs

2008 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requiremen (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
OLIVES	2,979	3.14	0.25	0.00	1.2	6,525
ALMONDS	1,519	3.62	0.25	0.00	1.2	4,055
WALNUTS	649	3.44	0.25	0.00	1.2	1,615
PRUNES	549	3.54	0.25	0.00	1.2	1,423
IRRIGATED PAST	795	4.16	0.00	0.00	1.2	2,353
CORN	109	2.00	0.00	0.00	1.2	87
ALFALFA	110	4.04	0.00	0.00	1.2	312
SUDAN	40	4.04	0.00	0.00	1.2	114
RICE	230	5.00	0.00	0.00	1.2	874
EUCL	106	2.00	0.00	0.00	1.2	85
WETLANDS	128	3.00	0.00	0.00	1.2	230
FIGS	116	3.54	0.00	0.00	1.2	271
BLUEBERRIES	5	3.00	0.00	0.00	1.2	9
ORANGES	3	2.71	0.00	0.00	1.2	5
	0	0.00	0.00	0.00	0.0	0
All other crops	0	0.00	0.00	0.00	0.0	0
Crop Acres	7,338					17,958

Total Irrig. Acres 7,338 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2008 District Water Inventory

Water Supply	Table 3		11,578
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	12
Evaporation - Precipitation	Table 4	minus	1
Spillage	Table 4	minus	35
Transfers/trades/wheeling		**plus/minus**	1,726
Non-agricultural sales (urban)		minus	6
Water Available for sale to customers			13,250
2008 Actual Agricultural Water Sales	From District Sales Records		11,604
Private Groundwater	Table 2	plus	6,490
Crop Water Needs	Table 5	minus	17,958
Drainwater outflow	(tail and tile not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		136

Table 7

Influence on Groundwater and Saline Sink

2008

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	12
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	7,338
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 8

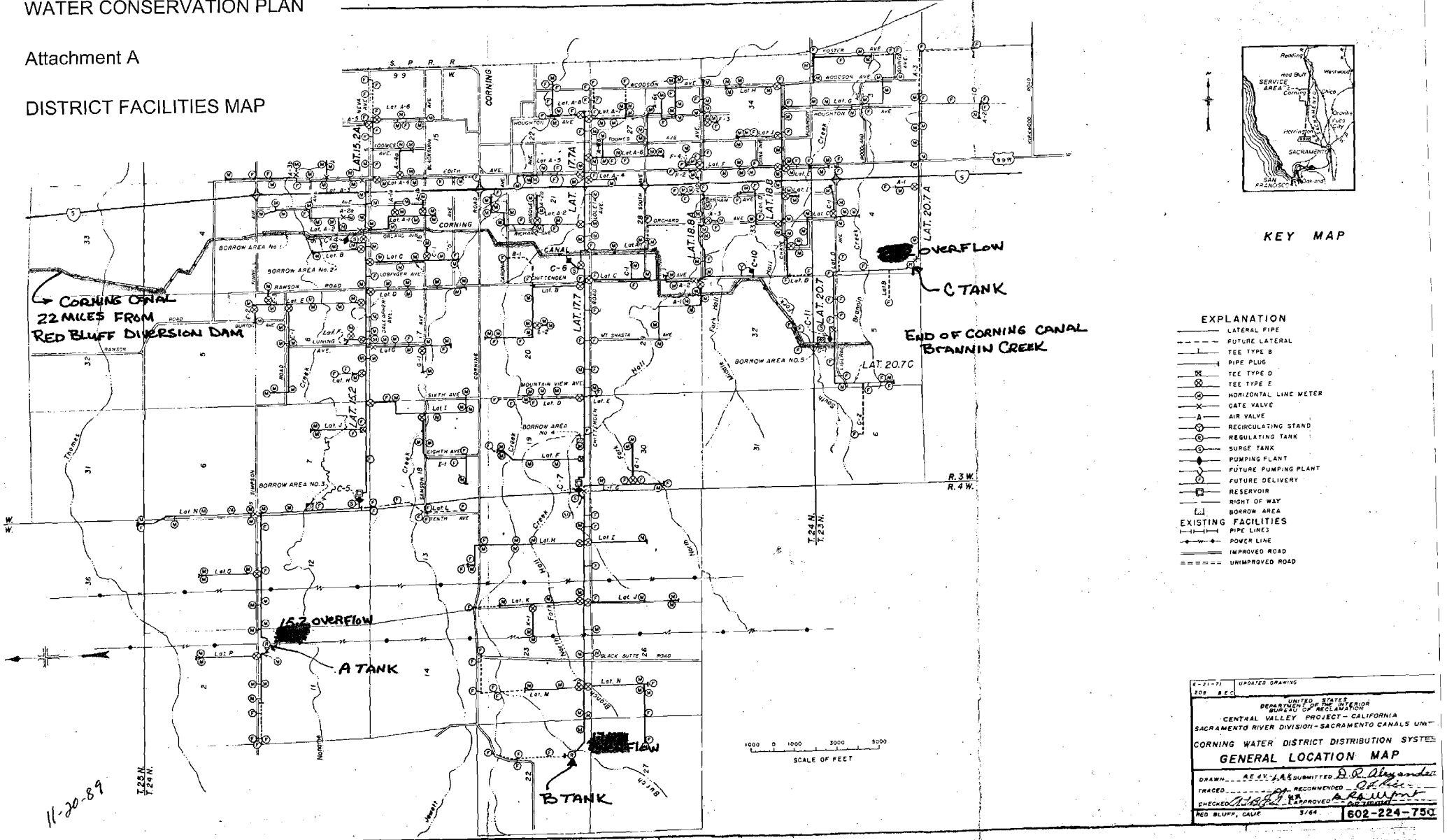
Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (acre-feet)	Other Water (transfer) (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
1999	10,615	31	0	0	0	0	10,646
2000	10,230	0	0	0	(807)	0	9,423
2001	11,380	0	0	0	(1,467)	0	9,913
2002	10,230	0	0	0	(807)	0	9,423
2003	8,799	0	0	0	(57)	0	8,742
2004	11,452	0	0	0	0	0	11,452
2005	7,326	0	0	0	0	0	7,326
2006	8,039	0	0	0	0	0	8,039
2007	11,518	0	0	0	0	0	11,518
2008	11,578	0	0	0	1,726	0	13,304
Total	101,167	31	0	0	(1,412)	0	99,786
Average	10,117	3	0	0	(141)	0	9,979

WATER CONSERVATION PLAN

Attachment A

DISTRICT FACILITIES MAP



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT – CALIFORNIA
SACRAMENTO RIVER DIVISION – SACRAMENTO CANALS UNIT
CORNING WATER DISTRICT DISTRIBUTION SYSTEM
GENERAL LOCATION MAP

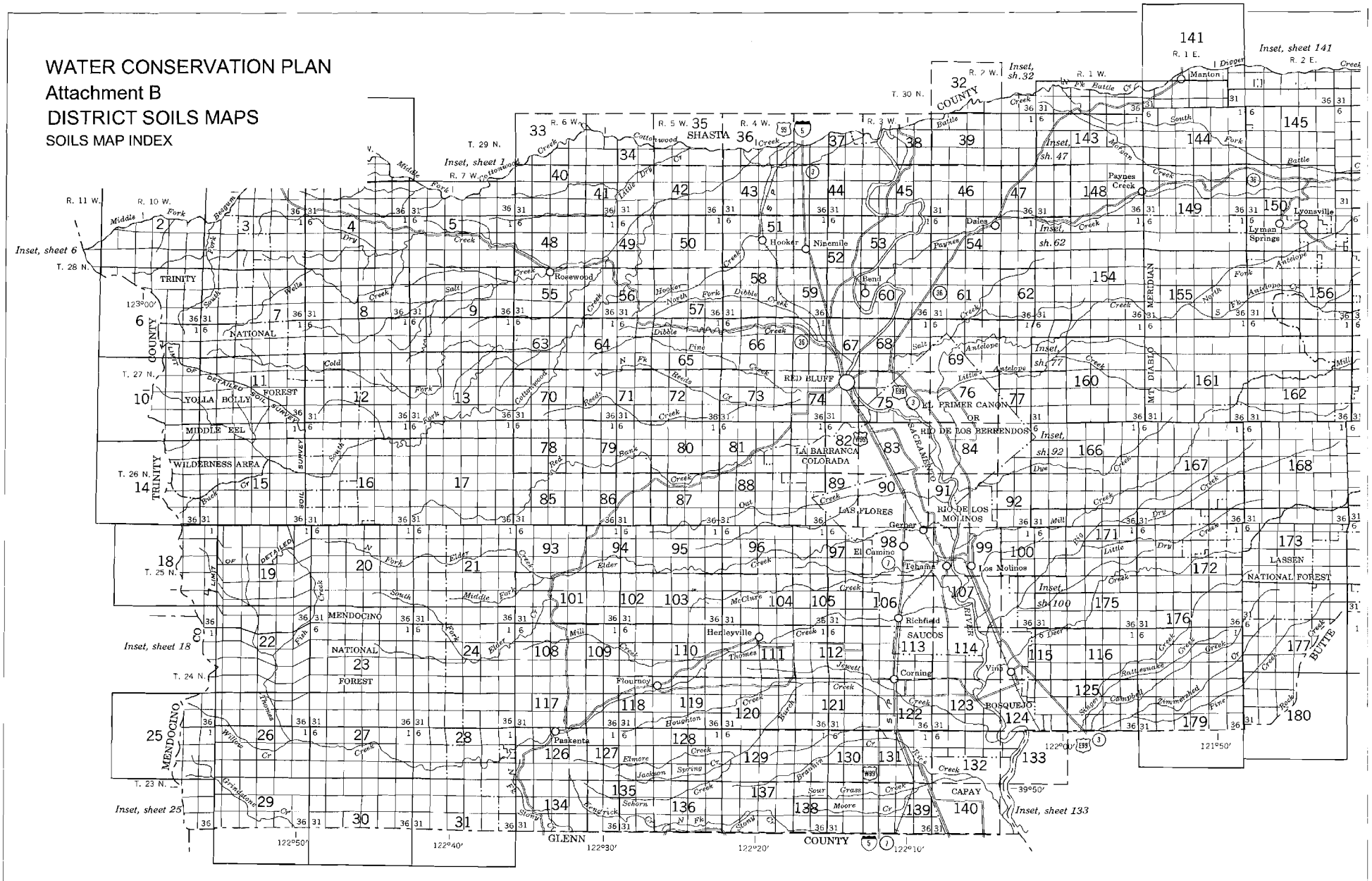
DRAWN RE 6-V-74 SUBMITTED D.R. Alexander
TRACED RECOMMENDED
CHECKED APPROVED
RED BLUFF, CALIF. 5/64 602-224-750

WATER CONSERVATION PLAN

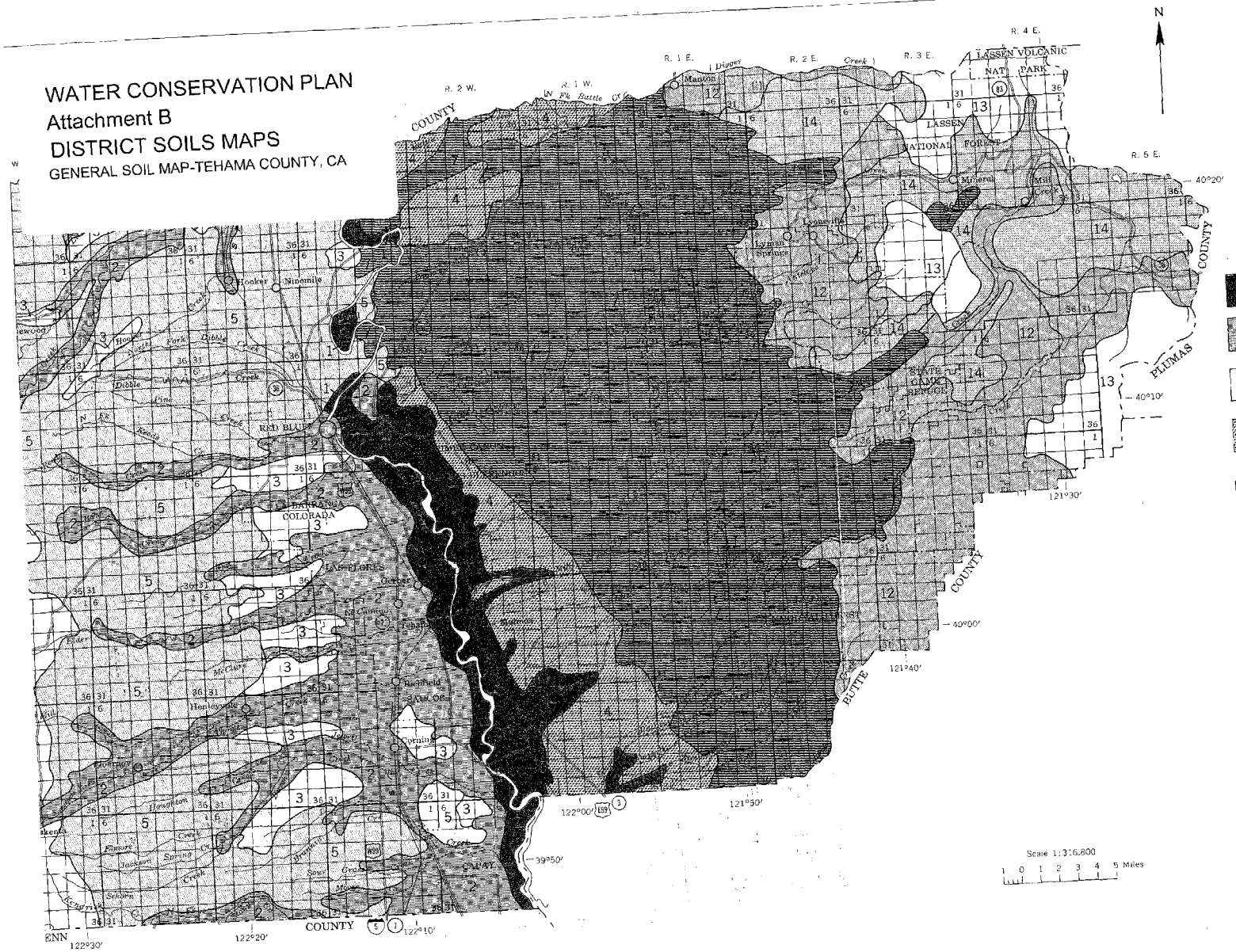
Attachment B

DISTRICT SOILS MAPS

SOILS MAP INDEX



WATER CONSERVATION PLAN
Attachment B
DISTRICT SOILS MAPS
GENERAL SOIL MAP-TEHAMA COUNTY, CA



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
U. S. FOREST SERVICE

CALIFORNIA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
TEHAMA COUNTY, CALIFORNIA

SOIL ASSOCIATIONS

SOILS OF THE FLOOD PLAINS AND TERRACES

1 — Columbia-Vina association: Very deep, nearly level, moderately fine textured to moderately coarse textured soils on flood plains of the Sacramento River

2 — Maywood-Tehama association: Very deep to moderately deep, nearly level to very gently sloping soils on flood plains and terraces along tributaries of the Sacramento River

3 — Corning-Redding association: Nearly level to sloping, gravelly, medium-textured soils that are moderately deep to shallow to claypan or hardpan; on terraces west of the Sacramento River and along its tributaries

4 — Tuscan-Inks association: Nearly level to steep, cobbly soils that are shallow to moderately deep to hardpan; on terraces east of the Sacramento River

SOILS OF THE FOOTHILLS

5 — Newville-Dibble association: Shallow to deep, moderately steep or steep, medium-to fine-textured soils underlain by soft sedimentary rock

6 — Millsholm-Lodo association: Shallow to moderately deep, moderately steep to very steep soils underlain by sandstone and shale

7 — Toomes-Guenoc association: Shallow or moderately deep, rocky, gently sloping to steep soils underlain by volcanic rock

SOILS OF THE MOUNTAINS

8 — Maymen-Los Gatos-Parrish association: Shallow or moderately deep, steep or very steep, rocky soils underlain by sandstone and shale

9 — Henneke-Stonyford association: Shallow or moderately shallow, steep or very steep, rocky soils underlain by volcanic rock

10 — Dubakella-Neuns association: Moderately deep or deep, steep or very steep, stony soils underlain by volcanic rock

11 — Sheetiron-Josephine association: Moderately deep or deep, steep or very steep soils underlain by hard sedimentary rock

12 — Cohasset-McCarthy association: Moderately deep or deep, moderately steep or steep, stony soils underlain by volcanic rock

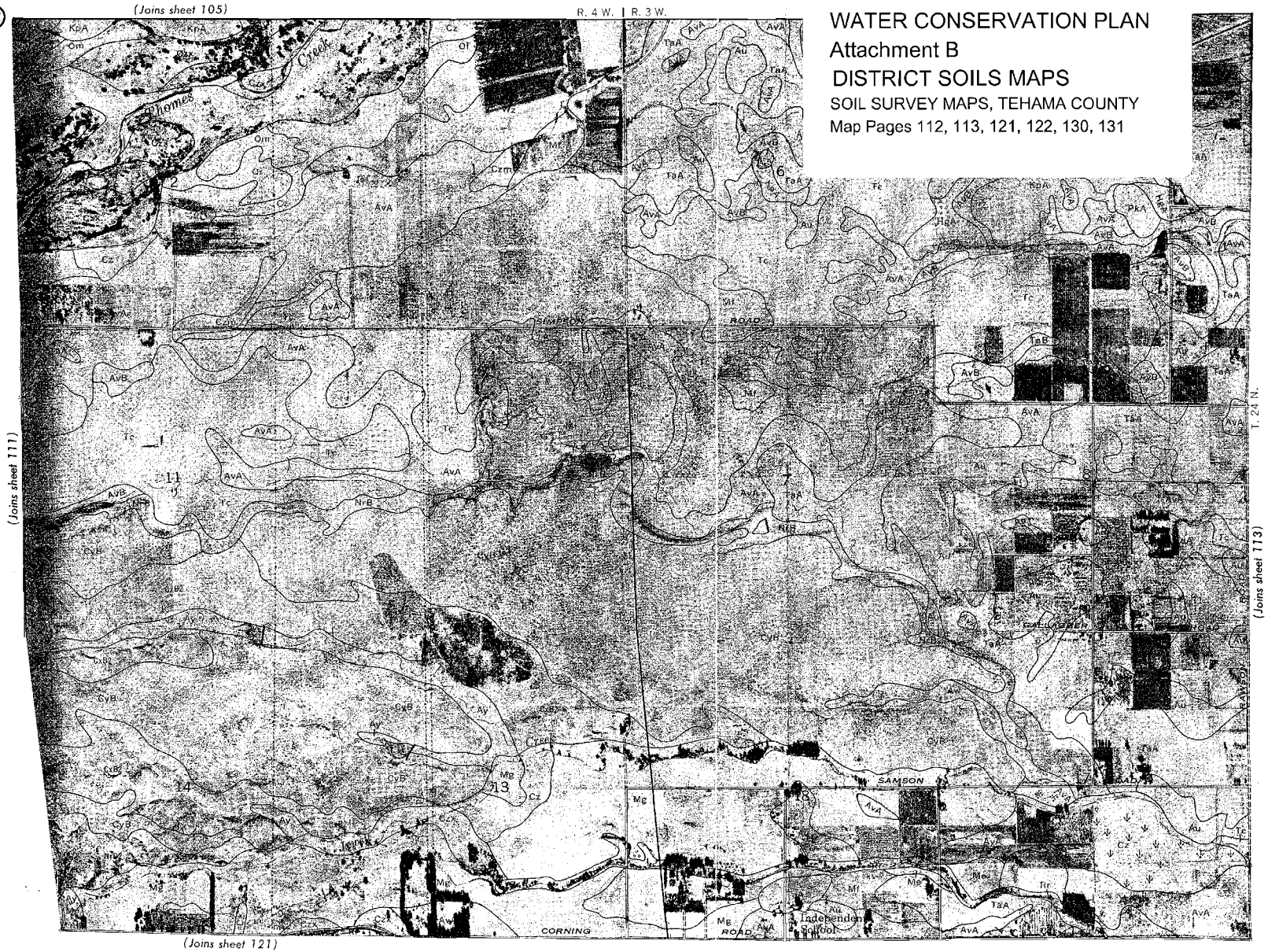
13 — Windy-Iron Mountain association: Very shallow or moderately deep, moderately steep or steep, stony soils underlain by volcanic rock

14 — Jiggs-Lyonsville-Forward association: Moderately deep, moderately steep or steep, stony, light-gray soils underlain by volcanic rock

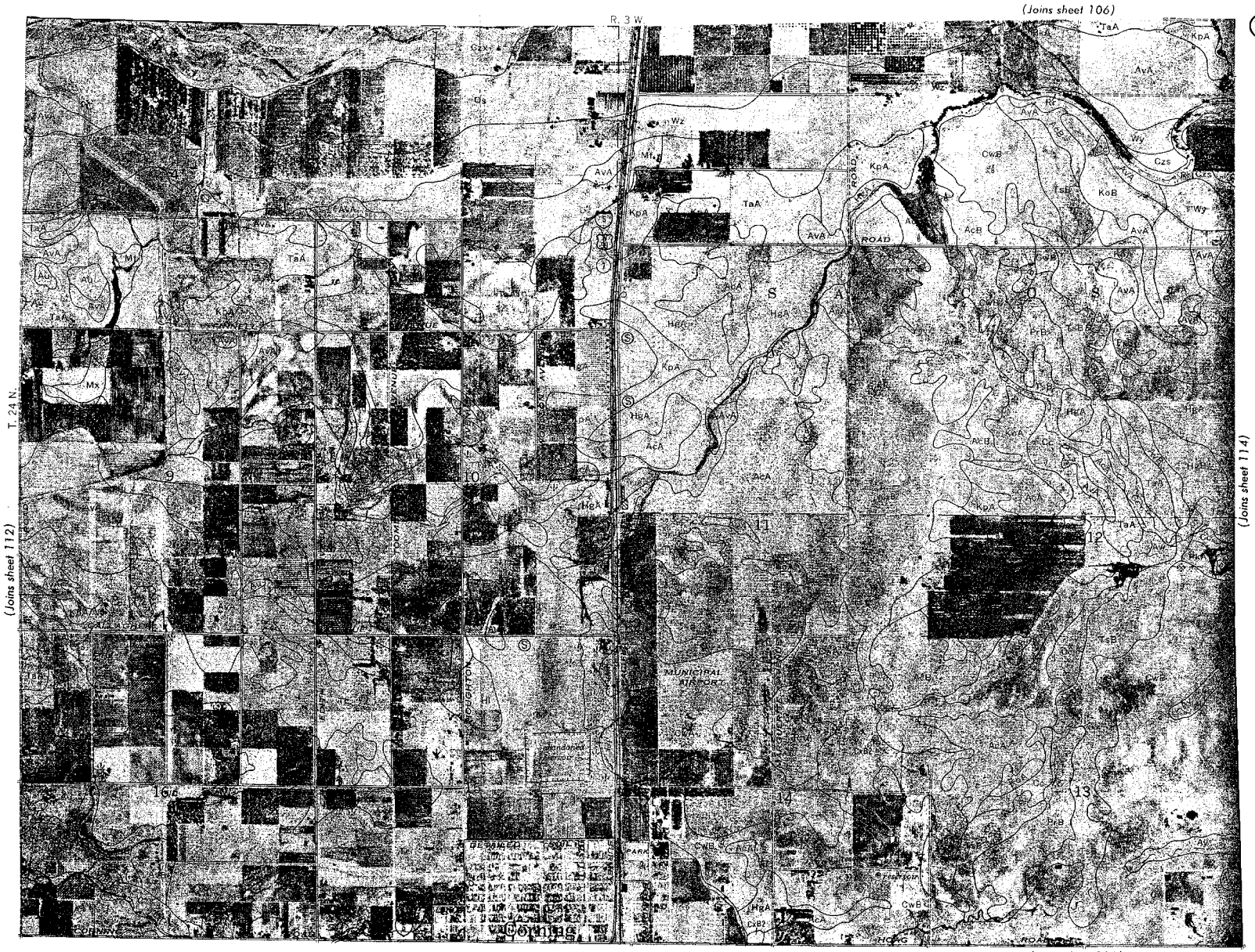
October 1965

TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 112

WATER CONSERVATION PLAN
Attachment B
DISTRICT SOILS MAPS
SOIL SURVEY MAPS, TEHAMA COUNTY
Map Pages 112, 113, 121, 122, 130, 131



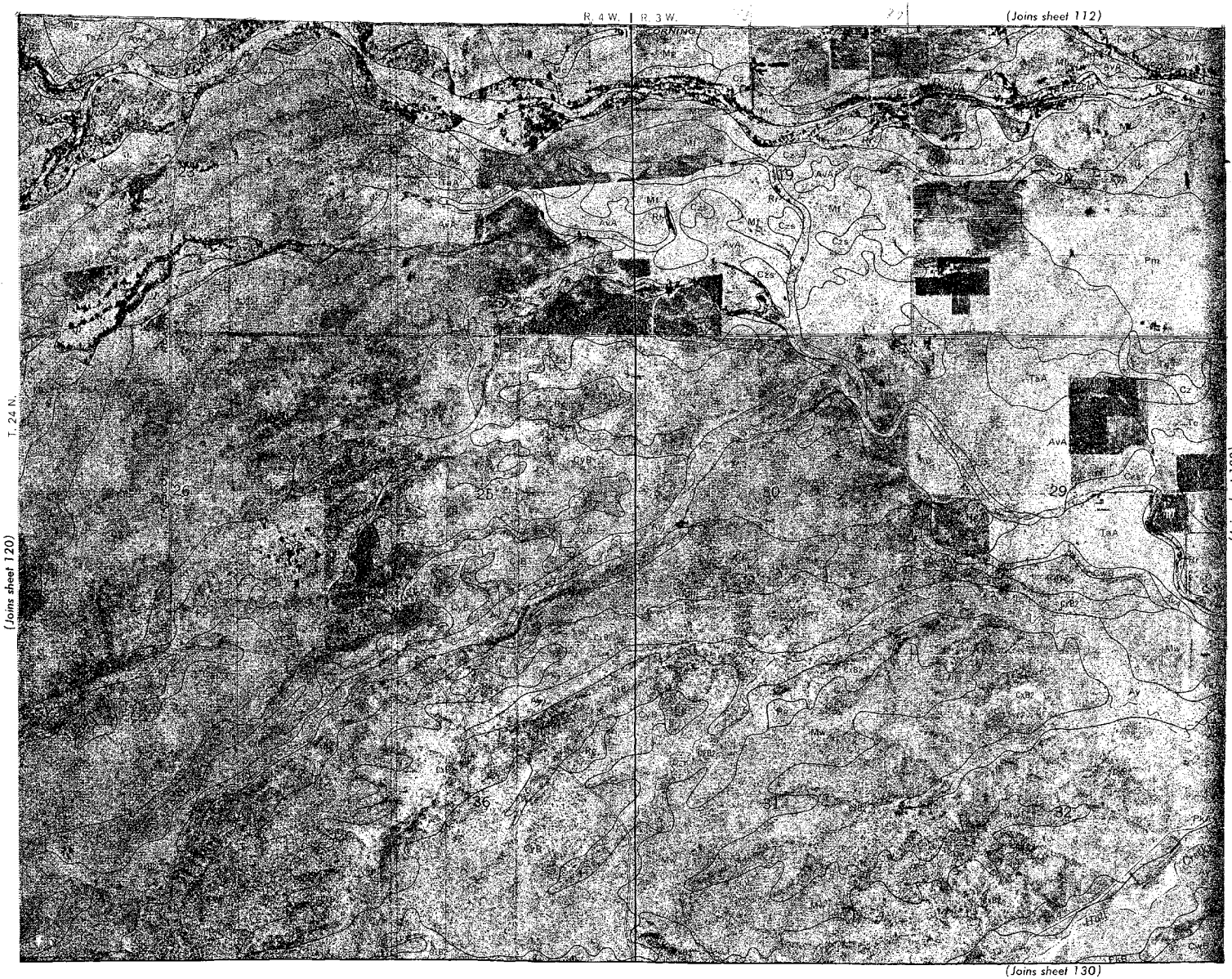
TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 113



This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, Forest Service, Pacific Southwest Forest and Range Experiment Station, United States Department of Agriculture; the California Agricultural Experiment Station, and the California Division of Forestry.

Range, township, and section corners shown on this map are indefinite.

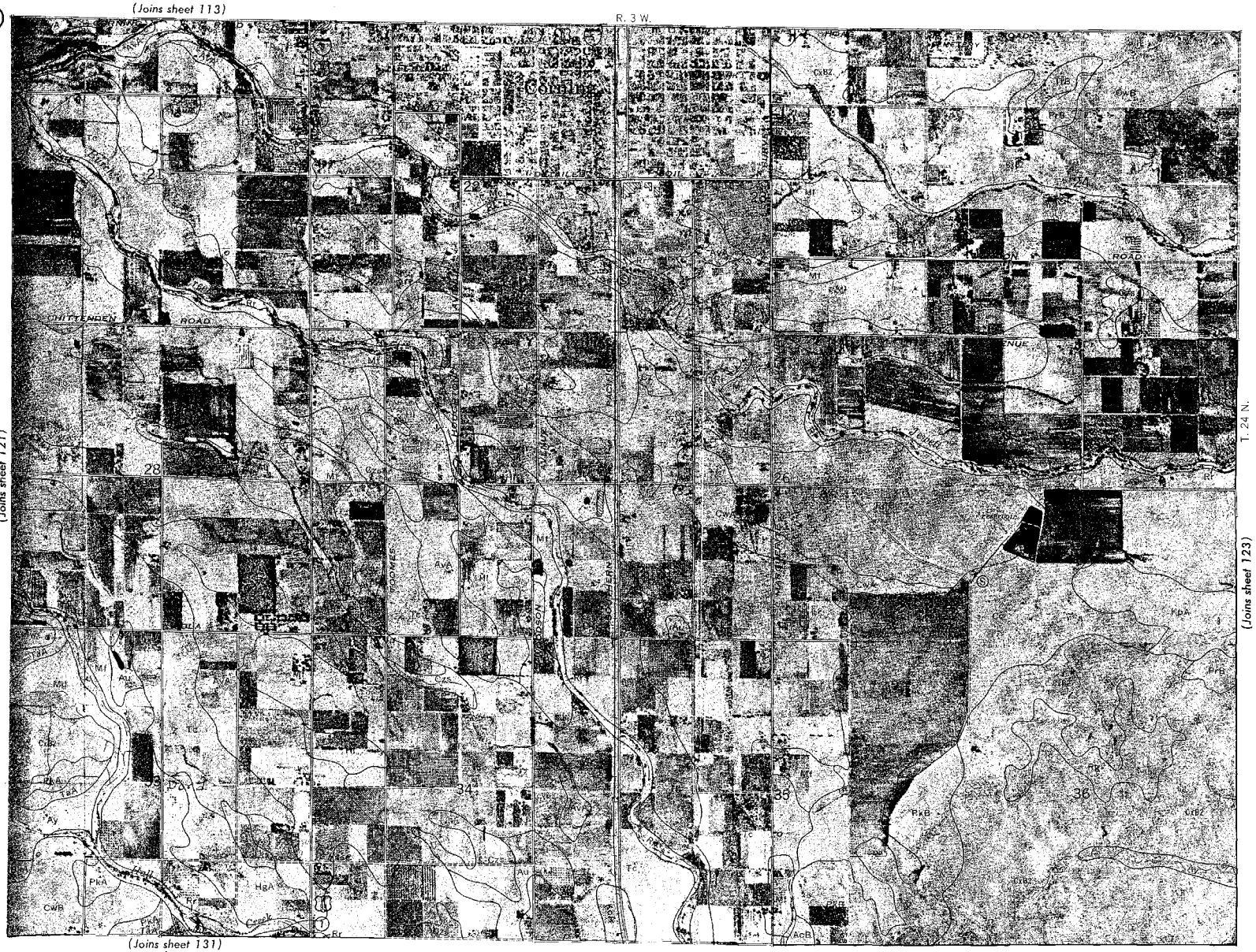
TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 121



This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, Forest Service, Pacific Southwest Forest and Range Experiment Station, United States Department of Agriculture; the California Agricultural Experiment Station, and the California Division of Forestry.

Range, township, and section corners shown on this map are indefinite.

TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 122



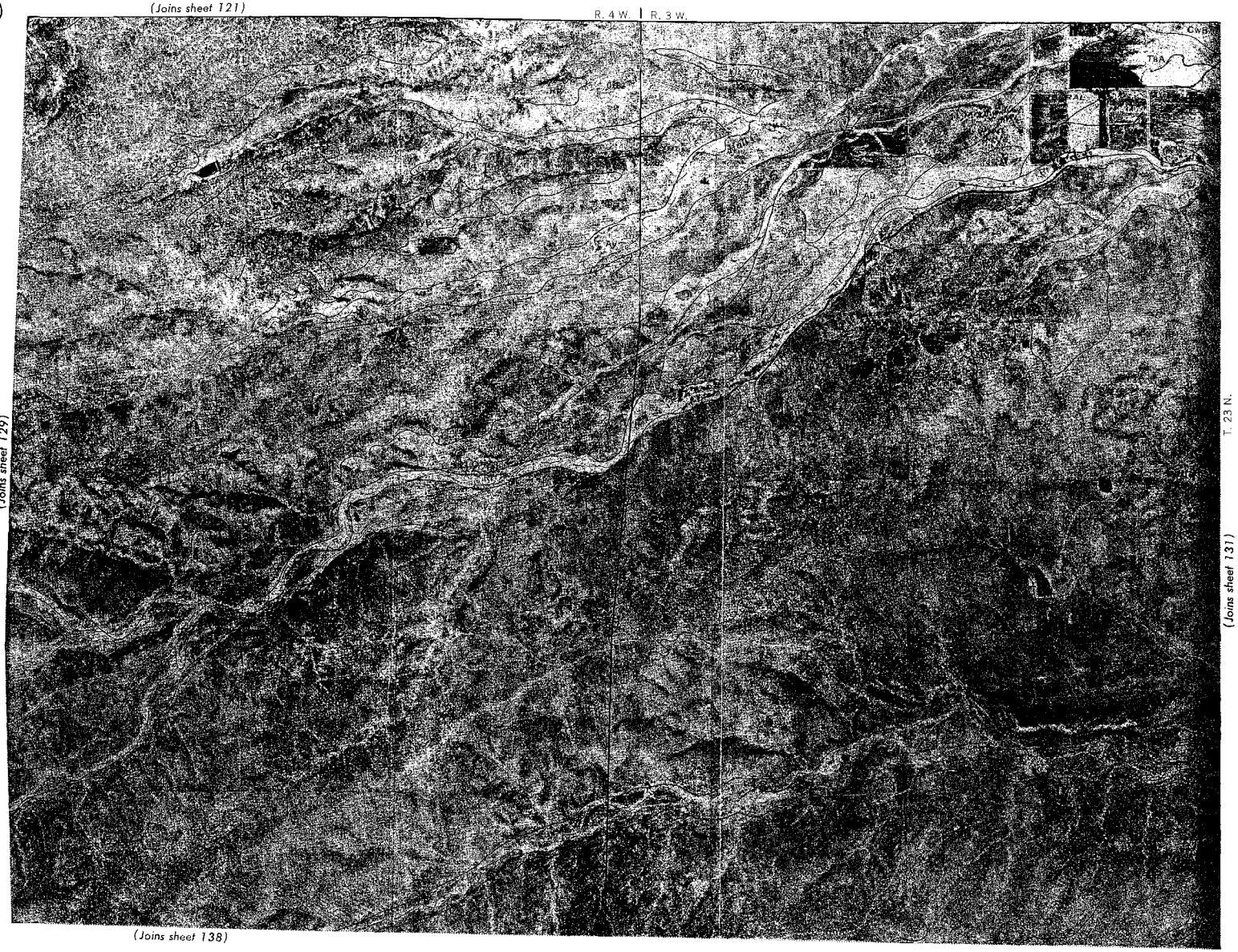
TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 130

130

(Joins sheet 121)

R. 4 W. | R. 3 W.

N



(Joins sheet 129)

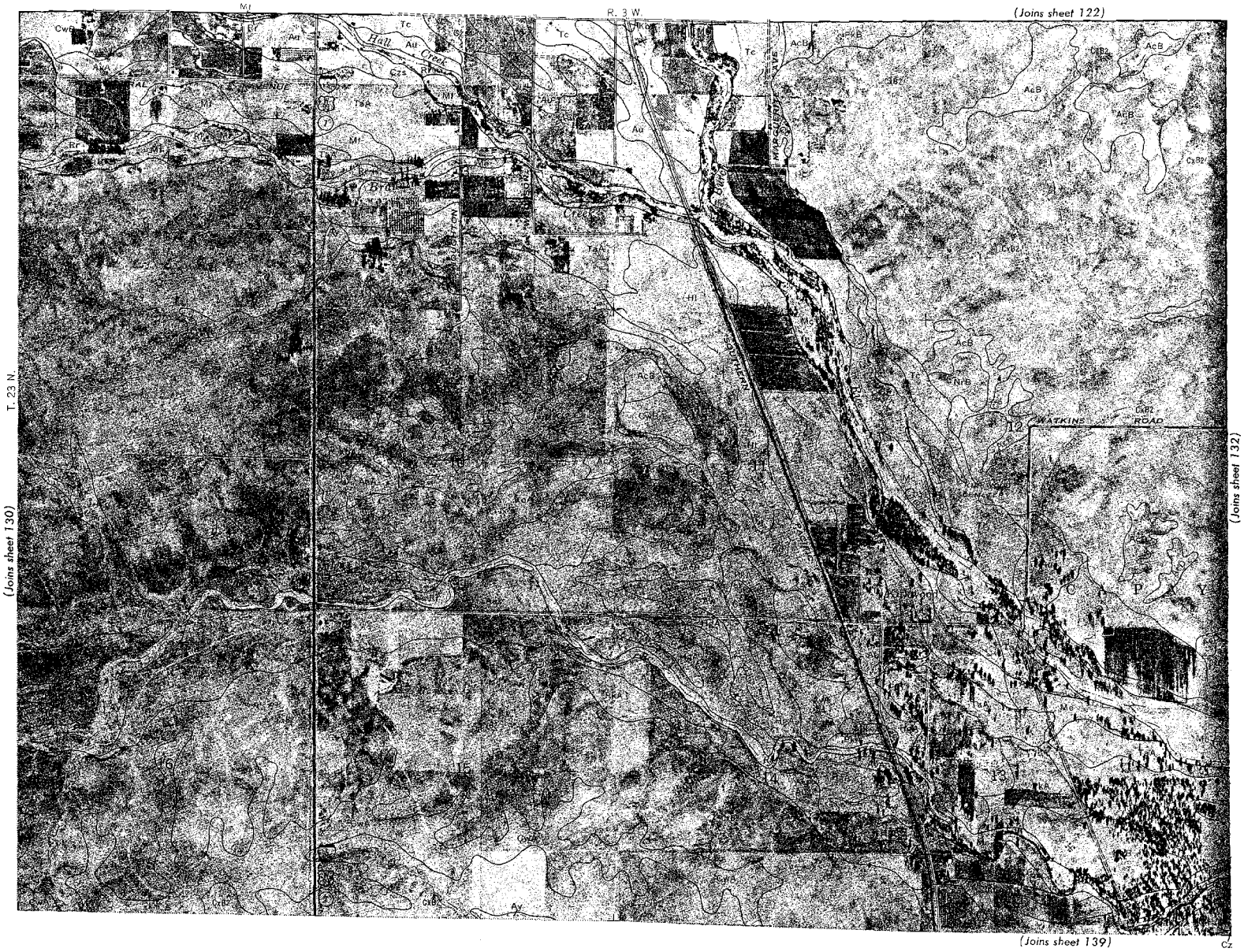
T. 23 N.

(Joins sheet 131)

(Joins sheet 138)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

TEHAMA COUNTY, CALIFORNIA — SHEET NUMBER 131



131

N

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, Forest Service, Pacific Southwest Forest and Range Experiment Station, United States Department of Agriculture; the California Agricultural Experiment Station, and the California Division of Forestry.

Range, township, and section corners shown on this map are indefinite.

WATER CONSERVATION PLAN
Attachment C
CORNING WATER DISTRICT
RULES & REGULATION
Modified April 19, 2006

CORNING WATER DISTRICT

OPERATIONAL RULES AND REGULATIONS

Landowners and water users in the Corning Water District need to familiarize themselves with the District's Rules and Regulations in order to make their farming operations consistent with District requirements.

1. FURNISHING OF WATER

The delivery of water to, and its use by, the applicant shall be subject to all regulations of the Board of Directors of the Corning Water District as same may now or hereafter be amended or adopted, and subject to the District's water rights or contracts.

Water will be delivered by the District subject to the terms and conditions of the contract between the District and the Bureau of Reclamation under which said water is made available to the District. All users must furnish proof of eligibility as may be requested by the District in order to comply with Reclamation Law.

Water is generally available all year but service may be restricted or discontinued by the Tehama-Colusa Canal Authority during certain periods. Service may also be discontinued at any time while maintenance or repair work is being done by the Bureau of Reclamation, Tehama-Colusa Canal Authority, or the District.

Note-The Owner is the responsible party for payment of all water delivered to his property.

2. WATER CONSERVATION PLAN

The Reclamation Reform Act of 1982 and the Central Valley Project Improvement Act of 1992 requires that District with certain types of contracts for water with the Bureau of Reclamation prepare and submit Water Conservation Plans with appropriate goals, measures and timetables. The law specifies that the Plan identify best management practices including, but not limited to, efficient water management practices developed according to California State Law. The purpose of the Plan is to promote the highest level of water use efficiency reasonably achievable by project contractors using best available cost-effective technology and best management practices.

The Corning Water District prepared a plan that was approved by the Bureau of Reclamation in 1996. A 5-Year update was submitted in 2002. The District Board of Directors, in submitting the plan, recognized the need to promote water efficiency in a practical and economically feasible manner. As the Plan is implemented, the water users will be encouraged to use water efficiency practices that are technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not other wise unreasonable for water users to carry out.

3. WATER RATES

Water rates shall be reviewed annually by the Board of Directors and may be revised from time to time, as the Board of Directors deems necessary or desirable. Rates established shall include charges for water sold and distributed by the Bureau of Reclamation through the Corning Canal, operation and maintenance costs, a reserve fund required by the water service contract with the Bureau of Reclamation, and such additional reserve funds and such other cost elements as the Board deems proper.

4. WATER ORDER ESTIMATE AND APPLICATION

Before any water is delivered in any crop year, each water user must complete and file an application for "Ag or M&I Water" indicating the total amount of water the applicant estimates will be required for the ensuing crop year (the "seasonal estimate"). Prior to the date of the first delivery of water, or by April 1st of each year, or on such other date as the Board of Directors sets, each water user shall file such application with the District. In years of reduced water supplies, applicants filing an application after the filing date may receive no water allocation at all or may only receive water on a secondary priority basis, and applications received thirty days after the filing deadline will be rejected.

The application for Ag or M&I Water must be signed by both the owner of each parcel of land for which water service is required and the tenant, if any, of each parcel. It is, however, understood that the owner will be responsible for non-payment of any and all water bills of the tenant. The Ag or M&I Water Application shall be in a standard, printed form approved by the Board of Directors.

5. WATER SECURITY DEPOSIT PAYMENT

At the time of filing an "Ag or M&I Water" application, each applicant for water service shall pay the District, in the form of a water deposit, at least 20% of the seasonal estimate as set forth in the "Ag or M&I Water" application. Said water deposit will be held until the completion of the irrigation season, at which time it may be applied to the seasons final bill, held over for the next water season, or refunded. Water Security Deposits, held as security, will not be considered as payment of any charges, until end of the irrigation season or until agreed upon by the water user and the General Manager.

6. DELINQUENT ACCOUNTS

Any unpaid charges due for water, assessments, or other services shall be paid by the first day of the calendar month after billing, and shall bear interest at the rate of 1% per month commencing the first day the charges become delinquent. In the event of default by a tenant, the landowner shall bear full responsibility for payment of any balance due and unpaid, including penalty and interest.

All water users who's account remains delinquent for more than 30 days will be given an opportunity for a hearing, before water deliveries are discontinued. In the event water service is terminated as a result of nonpayment, all charges, including penalties and interest must be paid before water service will be restored.

Any delinquent and unpaid charges for water or other services, or either, will become a lien on the land.

7. MONTHLY BILLING & STATEMENT OF ACCOUNTS

On or around the tenth of each month the District will send the landowner and/or tenant a statement showing the previous months water use and all unpaid charges for the period.

7.1 WATER BILLING (Modified by Board action 4-19, 2006)

Water meters are read around the 27th day of the each month during the water season. All water use is metered and water billings calculated monthly and included on the "Monthly Billing Statement". All water use is billed to the Landowner, unless an "Owner-Tenant Agreement" is submitted to and approved by the District.

7.2 OWNER-TENANT AGREEMENT (Modified by Board action 4-19, 2006)

The Owner-Tenant Agreement authorizes the District to accept water orders from a tenant, make water deliveries to a tenant, and send water billings directly to a tenant. The Agreement shall include the location of all applicable turnouts, parcel numbers, owners name and address, tenants name and address, phone numbers, owner signature, and tenant signature. A duly certified notary must notarize the owner's signature and the tenant's signature. The Agreement authorizes the District to send the water bill directly to the tenant. However, the landowner remains responsible for any and all charges for water used on his property. In the event the tenant allows the account to become 30 days delinquent, the Agreement becomes null and void, water service will be discontinued, the Tenant's name shall be removed from the account, and all past due bills are sent to the landowner.

8. O & M AND REPAYMENT ASSESSMENT CHARGES

In 1975 the development period ended and Repayment began on the loan acquired from the U.S. Government to build the District's distribution system. Repayment of the District's 9d Contract is a 40-year interest free loan. Total repayment is based on $296 per acre or $7.40 per acre per year. The O&M Assessment is levied at the rate of $10.41 per acre per year and is used for operation and maintenance or the District.

9. WATER ORDERS

Water deliveries must be scheduled by placement of a water order prior to 12 PM (noon) the day before the irrigation starts. For ordering purposes, the irrigation day starts at 6 am and continues for 24 hour to the following 6 am. The water order must include; name, location, start day and time, stop day and time, and gallons per minute. When the office is closed, daily water orders may be placed on the telephone recorder provided the order complies with the conditions outlined herein.

Monthly water orders will be accepted prior to the first day of each month. Monthly orders must be renewed each month. Water users not complying with submitted water order schedule will be subject to fines. Deadlines for ordering may be changed at any time by the District.

Water users taking water without submitting a proper water order or reporting changes to a previous water order will be subject to a $25 penalty for each violation.

10. WATER DELIVERY

If available, water ordered will be delivered but may be limited in quantity or delayed in delivery. When the demand is greater than the available supply, the water shall be distributed equitably as determined by the Board of Directors and in accordance with applicable law among those who have filed an application in accordance with Rule #4 of these Rules and Regulations. The District does not guarantee the delivery of water as to the time of delivery, quality, or amount.

Water deliveries may be discontinued for failure to comply with Rules #4, 5, &6.

11. CONNECTION TO DISTRICT TURNOUTS

The water user shall at his or her own expense take water from District turnouts in a manner approved by the District and shall provide all necessary materials and labor. All such connections shall be inspected and approved by the District Manager before being placed into operation. No modifications or additions may be made to District turnouts by other than District personnel. To prevent sudden pressure surges and water hammer in District pipelines, no rapid closing valves of any type will be permitted.

12. WATER METERS

The District will measure all water deliveries with meters installed by it. In the event a delivery meter fails to operate properly during the course of irrigation, every reasonable effort will be made to determine accurate water usage and the District's determination shall be final. A minimum of 4-acre feet per estimated irrigated acre per year would be charged for those water users not using enough to turn their meters.

13. TAIL WATER MANAGEMENT

The District Board of Directors recognizes that a certain amount of tail water releases will occur and that such releases may enhance downstream water quality and environmental habitat but it is the policy of the District that such tail water releases be minimized. All waterusers are advised to review their irrigation methods in advance of the irrigation season in order to avoid, to the extent possible, tail water releases. Therefore, all waterusers shall be encouraged to install recirculating structures or capturing ponds to capture and/or reuse tail water releases, or employ a method of irrigation that will control tail water releases, or make an agreement with one or more downstream District waterusers to capture their tail water releases.

Any wateruser who deliberately, carelessly, or otherwise wastes water on roads, roadside ditches, adjoining land or drainage channels, will be informed by District personnel that he is not complying with the District's Rules and Regulations. The wateruser will be allowed such length of time, as the District, in its sole discretion, deems reasonable to correct the spillage problem. If such wateruser does not make such corrections promptly, water service may de discontinued by the District.

14. RIGHTS OF ACCESS

District personnel shall have right of access, at anytime, to deliveries, pipelines, air release valves, and any other District facility for operation, maintenance, inspection, or repair. Precautions will be taken to protect trees, crops, soil surface, livestock, or any other property from damage.

15. CONSTRUCTION, LAND CLEARING, AND LEVELING

It shall be the landowner's or his agent's responsibility to obtain District permission before any clearing, leveling, ripping, changing of water channel, setting utility poles, or excavations for any purpose, if performed within District easements. District personnel will locate and mark pipelines or other District facilities in the area before such work, and any damage to District facilities or property shall be the liability of the landowner.

16. DAMAGES AND REPAIRS

The landowner and his tenants and agents hereby assume responsibility for and agree to hold the District harmless from all damage or claims for damage which may arise from his use of the water after it leaves the District delivery facility. Damages to District property caused by reason of acts or omissions of the landowner or his tenants or agents will be repaired by the District and the cost of repairs will be charged to the account for the delivery.

17. ADDITIONAL TURNOUTS

The district does not provide new or additional turnouts or meters to any property except at the sole expense of the landowner. The entire installation, including pipelines, valves, meters, etc. and the right-of-way (easement) shall thereafter become the property of the District. Any new connections, or turnouts, or modifications to existing turnouts must be approved by the District's General Manager prior to installation.

18. TOOLS AND EQUIPMENT

District-owned tools and equipment will not be loaned.

19. DELIVERY AREAS

Delivery areas shall be kept clean and free from brush, empty chemical containers and any other debris. No hazardous materials shall be stored or discharged on District rights-of way.

20. VIOLATION OF RULES AND REGULATIONS

Any violation of these rules may, after notice and opportunity to be heard, result in fines, or result in termination of water service.

21. AMENDMENT

These Rules and Regulations are in effect at the date of this review and may be amended or repealed at any time by resolution of the Board of Directors.

Corning Water District
PO Box 738
Corning CA, 96021-

Monthly Water Usage Report

Year: 2009

CORNING Water District

Number: FER500 **Tenant:**

	Turnout	Jan Usage	Usage	Usage	Usage	Usage	Usage	Jul Usage	Aug Usage	Sep Usage	Oct Usage	Nov Usage	Dec Usage	Annual Usage
1	7311R	0.00	6.02	0.00	0.00	17.36	54.54	54.13	71.91	55.96	21.18	0.00	2.01	283.10
2	7378R	0.00	1.63	0.00	0.02	0.04	0.00	1.82	1.50	0.00	0.00	0.00	0.34	5.34
3	7H98L-1	0.00	0.00	0.00	0.00	16.43	14.34	14.13	16.47	18.23	1.94	0.00	0.00	81.56
4	7K125A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	7M21R	0.00	30.55	0.00	21.52	39.62	76.75	72.72	65.53	40.00	6.94	0.00	1.73	355.35
6	7N111A	0.00	9.72	0.00	5.36	29.87	94.63	101.48	130.72	118.49	19.49	0.00	9.80	519.56
	Total:	0.00	47.91	0.00	26.91	103.32	240.27	244.29	286.12	232.68	49.54	0.00	13.87	1,244.91

Total Irrigated Acres: 978.42 Acres
Allocation: 1.02 Acre-Feet/Acre
Total Base Allocation: 1,000.00 A/F
Total Inter-District Transfer: 0.00 A/F
Total Intra-District Transfer: 250.00 A/F
Total Water Available: 1,250.00 A/F
Total Water Delivered to Date: 1,244.91 A/F Which is (1.27 Acre Feet/Acre)
Net water left: 5.09 A/F Which is (0.01 Acre Feet/Acre)

Summary Usage Report per Grower

Aug 2009

Corning Water District
PO Box 738
Corning CA

Grower:
Account:

Turnout	WM counter	Field	Acres	Time ON	Date ON	Date OFF	Time OFF	Reading ON	Reading OFF	Flow	Usage	Adj	Total usage	Average AF/A
7311R	2144	7311R	60.77	12:00 PM	7/31/2009	8/31/2009	12:00 PM	1,172.08	1,236.87	0.00	64.79	0.00	64.79	1.07
7311R	2260	7311R	60.77	12:00 PM	7/31/2009	8/31/2009	12:00 PM	512.19	519.31	0.00	7.12	0.00	7.12	0.12
7378R	2666	7378R	0.00	12:00 PM	7/31/2009	8/31/2009	12:00 PM	543,000.00	032,000.00	0.00	1.50	0.00	1.50	0.00
7H98L-1	2602	7H98L-1	10.00	12:00 PM	7/31/2009	8/31/2009	12:00 PM	269.73	286.20	0.00	16.47	0.00	16.47	1.65
7M21R	2262	7M21R	225.31	12:00 PM	7/31/2009	8/31/2009	12:00 PM	728.78	794.30	0.00	65.53	0.00	65.53	0.29
7N111A	2264	7N111A	332.42	12:00 PM	7/31/2009	8/31/2009	12:00 PM	3,764.23	3,894.94	0.00	130.72	0.00	130.72	0.39
Total Month:													**286.12**	

H20 Pro Field Measurement System
Water Allocation Report

Corning Water District

WATER CONSERVATION PLAN
Attachment D
CORNING WATER DISTRICT
WATER ALLOCATION REPORT-based on available supply
Mailed with Water Applications

Field	APN	Owner (if not shown on map)	Acres	Current Allocation AF/Acre	Entitled Acre/Feet
5513A	061-230-20		103.93	0.84	86.96
5A299L	069-070-28		1.97	0.84	1.65
	069-070-29		2.16	0.84	1.81
	069-070-46		9.96	0.84	8.33
	069-070-47		17.62	0.84	14.74
	069-070-48		8.67	0.84	7.25
	069-070-49		4.98	0.84	4.17
5C20R-23	069-140-38		2.37	0.84	1.98
5D06R	069-130-29	ZOGRAFOS, & MANSANET, .	10.25	0.84	8.58
5E136R-1	069-060-03	ZOGRAFOS, & MANSANET, .	19.39	0.84	16.22
5E136R-2	069-060-25		48.22	0.84	40.35
5E188R-1	069-060-24		20.00	0.84	16.74
5E188R-2	069-010-16		37.00	0.84	30.96
5E213L	069-010-17		39.39	0.84	32.96
5E213R	069-060-04	CARLSON, LLOYD & GLORIA	5.00	0.84	4.18
5E50R-3	069-090-44	ZOGRAFOS, & MANSANET, .	10.00	0.84	8.37
5E50R-4	069-090-41	REMICK, DAVID & TRACY	10.00	0.84	8.37
8157R	087-190-17	MIRALDA, DONNA	18.79	0.84	15.72
8F115R-2	087-150-04		9.80	0.84	8.20
	087-150-38		10.00	0.84	8.37
8F115R-4	087-100-53	MENDOZA, JORGE	9.85	0.84	8.24
8F25L-1	087-150-40		9.40	0.84	7.87
	087-150-41		9.40	0.84	7.87

8F25L-1	087-190-33		9.00	0.84	7.53
	087-190-34		9.00	0.84	7.53
8F413R-1	087-100-47	POWER, RAYMOND	8.29	0.84	6.94
8J24R	087-190-04		19.14	0.84	16.02
			463.58	**0.84**	**387.90**

Attachment D-4

CORNING WATER DISTRICT
P.O. Box 738
Corning, CA 96021

PHONE 530-824-2914

2009

WATER & ASSESSMENTS STATEMENT

To:

Date
2/10/2010

Delinquent After	Customer ID Number	Balance Due
JANUARY 31, 2010	CLE450	$0.00

Date	Transaction	Amount	Balance
08/31/2009	Balance forward		10,925.55
09/10/2009	INV #W15048. AUGUST WATER	10,644.75	21,570.30
09/16/2009	GENJRNL #9JE9-29. PAY PART OF JUL. WATER WITH DEPOSIT	-7,940.25	13,630.05
09/16/2009	PMT #36838. 9D-37	-2,979.00	10,651.05
10/10/2009	INV #W15228. September Water	2,934.45	13,585.50
11/03/2009	PMT #37039. 9D-42	-4,717.80	8,867.70
11/03/2009	GENJRNL #9JE11-3. Pay Water bills w/ Deposit	-4,059.75	4,807.95
11/10/2009	INV #W15393. October Water	5.85	4,813.80
12/08/2009	PMT #37115. 9D-44	-2,940.30	1,873.50
12/08/2009	PMT #37116. 9D-44	-1,873.50	0.00

CURRENT	1-30 DAYS PAST DUE	31-60 DAYS PAST DUE	61-90 DAYS PAST DUE	OVER 90 DAYS PAST DUE	Balance Due
0.00	0.00	0.00	0.00	0.00	$0.00

IMPORTANT
THIS STATEMENT INCLUDES ANY UNPAID ASSESSMENT CHARGES, UNPAID FINANCE CHARGES, AND UNPAID WATER CHARGES. THE MONTHLY USEAGE REPORT PROVIDES INFORMATION FOR ALLOCATION BASE, TRANSFERS, WATER DELIVERIES, AND NET WATER REMAINING. A MINUS NUMBER INDICATES THAT YOU ARE OUT OF ALLOCATED WATER.

WATER CONSERVATION PLAN
Attachment E
CORNING WATER DISTRICT
WATER SHORTAGE POLICY
Modified April 16, 2008

CORNING WATER DISTRICT
WATER SHORTAGE POLICY
WATER ALLOCATION AND TRANSFER POLICY

Policy Update April 16, 2008

When Corning Water District was formed in 1954 its' specific purpose was and still is as trustee of the surface water contracts with the federal government. The distribution of that water is to be controlled by reasonable and beneficial standards. The District is committed to managing its water supply to the mutual benefit of all lands within the District's service boundaries, first and foremost.

There will be times however where the quantity of the District's water supply is insufficient to meet the water demands of the crops grown. In those instances, a policy has been developed to address such shortages. Water shortages can occur for a variety of reasons due both to single and multiple events that may include; drought, and early start to the water season, a lack of spring rains, unseasonably high evapotranspiration, failures at Red Bluff Diversion Dam, failure of the Corning Canal, failure of the District's distribution system, etc.

This policy is adopted pursuant to the authority of the Board of Directors of Corning Water District (District) to make rules and regulations with respect to the distribution of the District's water. This policy implements the District's Rules and Regulation, and in particular Section 4 thereof, "Water Order Estimate and Application"

1. Notwithstanding anything else in this policy to the contrary, the Board of Directors may modify, suspend or otherwise alter the application of this policy and District's rules, on a case-by-case basis, in order to avoid or minimize, to the extent reasonably possible, undue or extreme hardship.

2. (a) No water will be allocated to lands which are not eligible to receive project water under Federal Reclamation law, or other applicable provisions of state or federal law or the District's water contracts with Bureau of Reclamation.

(b) No water will be allocated to any land that is more than one-year delinquent in the payment of any assessment, or is delinquent at all in the payment of any other District toll or charge.

3. No water will be allocated to any land for which an annual application for water service, completed on a form provided by the District, is not filed with the District prior to the application date established by this Board as provided by law.

4. Transfers of water from the land to which it has been allocated will be permitted only upon the following conditions:

(a) Applications for such transfers must be submitted in writing to the District, executed both by the landowner (and tenant, if any) of the land for which the water was allocated, and the landowner (and tenant, if any) of the land to which the water is to be transferred. Transfer applications for one-year transfers must be submitted annually.

(b) All transfers will be processed in accordance with State & Federal Law, including the CVP Improvement Act (PL 102-575), and all rules or guidelines adopted there under.

(c) Any transfer to land outside the District must be approved by the District and the Bureau of Reclamation.

(d) All water transferred beyond the District boundaries will be billed to those landowners to whom it was originally allocated. Persons transferring water will be charged all costs incurred in the transfer, including a district wheeling fee, which is to be paid to the receiving District for operation and maintenance costs.

5. The water to be allocated to lands making application therefore will be the supply available to the District, and delivered by the Tehama-Colusa Canal Authority, less an amount determined by the Manager necessary to be set aside for operations, transmission losses, meter discrepancies or inaccuracies and emergencies.

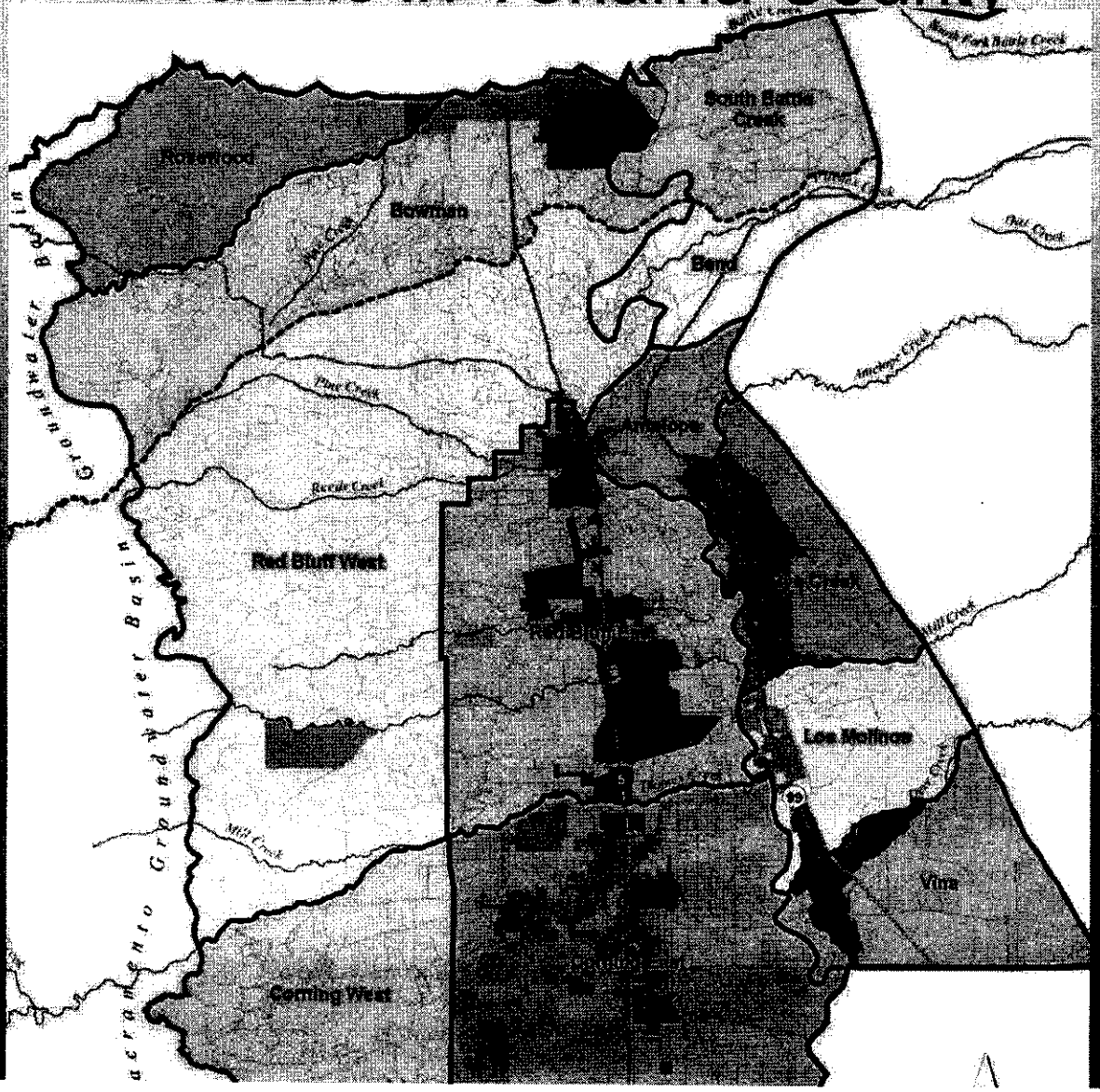
6. Allocations to land that qualify under this policy will be based on the assessed acres of each parcel, as that acreage is shown in the last equalized assessment book of the District. Allocation, if any, will be made to any land, which is subject to a secondary water supply contract only in accordance with that contract.

7. If an allocation is completely used the District will terminate deliveries, provided that if there is any use in excess of a parcel's allocation prior to termination, the District will surcharge the water at the rate of $200 per acre foot.

ATTACHMENT G

Map and description of
Sacramento Valley Groundwater
Basin, Corning Subbasin

The 12 Subbasins in Tehama County



Sacramento Valley Groundwater Basin, Corning Subbasin

- Groundwater Basin Number: 5-21.51
- County: Tehama, Glenn
- Surface Area: 205,640 acres (321 square miles)

Boundaries and Hydrology

The Corning Subbasin comprises the portion of the Sacramento Valley Groundwater Basin bounded on the west by the Coast Ranges, on the north by Thomes Creek, on the east by the Sacramento River, and on the south by Stony Creek. Stony Creek is believed to be a hydrologic boundary throughout the year. The Corning Subbasin is likely contiguous with the Red Bluff Subbasin at depth. Annual precipitation ranges from 19- to 25-inches, increasing to the north.

Hydrogeologic Information

Water-Bearing Formations

The Corning Subbasin aquifer system west is comprised of deposits of late Tertiary to Quaternary age. The Quaternary deposits include Holocene alluvium and the Pleistocene terrace deposits of the Modesto and Riverbank Formations. The Tertiary deposits consist of the Pliocene Tehama and Tuscan Formations.

Holocene Stream Channel Deposits. These deposits consist of unconsolidated gravel, sand, silt and clay derived from the erosion, reworking, and deposition of adjacent Tehama Formation and Quaternary stream terrace deposits. The thickness varies from 1- to 80-feet (Helley and Harwood 1985). The unit represents the upper part of the unconfined zone of the aquifer and is moderately-to-highly permeable; however, the thickness and areal extent of the deposits limit the water-bearing capability.

Pleistocene Modesto Formation. The Modesto Formation (deposited between 14,000 to 42,000 years ago) consists of poorly indurated gravel and cobbles with sand, silt, and clay derived from reworking and deposition of the Tehama and the Riverbank formations. The deposit ranges from less than 10 feet to nearly 200 feet across the valley floor (Helley and Harwood 1985). These terrace deposits are observed along Thomes Creek, Burch Creek, and Stony Creek.

Pleistocene Riverbank Formation. The Riverbank Formation (deposited between 130,000 to 450,000 years ago) consists of poorly-to-highly permeable pebble and small cobble gravels interlensed with reddish clay sands and silt. The formation ranges from less than one foot to over 200 feet thick depending on location (Helley and Harwood 1985). Surficial deposits are observed over the eastern third of the subbasin and along Burch Creek and its tributaries.

Pliocene Tehama Formation. The Tehama Formation consists of sediments originating from the coastal mountains and is the primary source of

groundwater for the subbasin. The formation ranges in thickness up to 2,000 feet, increasing in thickness from west to east, dipping 4 degrees to the east (DWR 1982). The majority of the formation consists of fine-grained sediments indicative of deposition under floodplain conditions (McManus 1993). The majority of both coarse and fine-grained sediments are unconsolidated or moderately consolidated.

Pliocene Tuscan Formation. The Tuscan Formation is located within the eastern third of the subbasin. The formation occurs at a depth of approximately 200 feet from the surface and is composed of a series of volcanic mudflows, tuff breccia, tuffaceous sandstone, and volcanic ash layers. The formation is described as four separate but lithologically similar units, A through D, (with Unit A being the oldest), which in some areas are separated by layers of thin tuff or ash units (Helly and Harwood 1985). Units A, B, and C are believed to extend as far west as the Corning Canal. Unit A is the oldest water-bearing unit of the formation and is characterized by the presence of metamorphic clasts within interbedded lahars, volcanic conglomerate, volcanic sandstone, and siltstone. Unit B is composed of fairly equal distribution of lahars, tuffaceous sandstone, and conglomerate. Unit C consists of massive mudflow or lahar deposits with some interbedded volcanic conglomerate and sandstone. In the subsurface, these low permeability lahars form thick, confining layers for groundwater contained in the more permeable sediments of Unit B.

Subareas of the Corning Subbasin

Sacramento Valley Floodplain. Pleistocene and Holocene silt, sand, and gravel deposits in the vicinity of the City of Corning extend to depths of 50 to 185 feet. The proportion of sand and gravel in the unconsolidated alluvium overlying the Tehama Formation averages 20, 18, and 25 percent for depth intervals of 20- to 50-feet, 50- to 100-feet, and 100- to 200-feet respectively (Olmsted and Davis 1961). The Tehama Formation near the City of Corning consists of yellow clay, poorly consolidated sandstone, and conglomerate.

Dissected Uplands. The surface of the upland area within the central third of the subbasin between Thomes Creek and Stony Creek includes a coarse-grained gravelly conglomerate locally capping the Tehama Formation. Wells drilled in this area encounter up to 60 feet of coarse deposits before reaching fine-grained Tehama deposits. The deposits are believed to be formed as a response to a fixed base level by impeded or enclosed drainages and have been referred to as the Red Bluff Formation. (Helley and Harwood 1985). The shallow gravel is not a significant contributor to groundwater storage due to its position above the saturated zone.

Thomes Creek Floodplain. Bounding the northern extents of the subbasin, the Thomes Creek floodplain includes Holocene alluvium underlain by deposits of both the Modesto and Riverbank Formations. The floodplain averages about 1 mile in width and extends from the Coast Ranges to the Sacramento River floodplain.

Stony Creek Floodplain. The southern part of the subbasin, including the Capay plain, is alluviated by older floodplain deposits and channel deposits

of Stony Creek. This area includes a moderately well-defined, highly productive, shallow water-bearing zone reaching a thickness of 150 feet along Stony Creek and 110 feet along the Sacramento River. Domestic and shallow irrigation wells along the west side of Capay plain and south of the Tehama County line provide moderate-to-high yields from confined groundwater in 10- to 50-foot thicknesses of highly pervious pebble and cobble gravels. In the northwest part of Capay plain, older alluvium of the Riverbank Formation extends from the surface to 150 feet. Wells in this zone have low-to-moderate yields. This zone is underlain by a highly productive confined gravel averaging 40 feet in thickness (USBR 1960).

Groundwater Level Trends

Review of hydrographs for long-term comparison of spring-spring groundwater levels indicates a decline of 5- to 12-feet associated with the 1976-77 and 1987-94 droughts, followed by a recovery to pre-drought conditions of the early 1970's and 1980's. Groundwater level data show seasonal fluctuations of approximately 3- to 15-feet for unconfined wells (5-feet near the Sacramento River), up to 30-feet for semi-confined wells away from the river, 5- to 20-feet for composite wells, and 10- to 30-feet for confined wells. Overall, there does not appear to be any increasing or decreasing trends in the groundwater levels.

Groundwater Budget (Type B)

Estimates of groundwater extraction for the Corning Subbasin are based on surveys conducted during the years of 1993, 1994, and 1997. Surveys included landuse and sources of water. Groundwater extraction for agricultural use is estimated to be 152,000 acre-feet. Groundwater extraction for municipal and industrial uses is estimated to be 6,600 acre-feet. Deep percolation of applied water is estimated to be 54,000 acre-feet.

Groundwater Storage

The storage capacity of the subbasin was estimated based on estimates of specific yield for the Sacramento Valley as developed in DWR (1978). Estimates of specific yield, determined on a regional basis, were used to obtain a weighted specific yield conforming to the subbasin boundary. The estimated specific yield for the subbasin is 6.7 percent. The estimated storage capacity to a depth of 200 feet is approximately 2,752,950 acre-feet.

Groundwater Quality

Characterization. Calcium-magnesium bicarbonate and magnesium-calcium bicarbonate are the predominant groundwater types in the subbasin. The subbasin has localized areas of calcium bicarbonate waters near Stony Creek. Total dissolved solids concentrations range from 130-to 490-mg/L, averaging 286 mg/L (DWR unpublished data).

Impairments. The Corning Subbasin has locally high calcium.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	20	0
Radiological	19	0
Nitrates	20	0
Pesticides	18	0
VOCs and SVOCs	16	0
Inorganics – Secondary	20	0

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range 50 – 3,500	Average: 977 (63 Well Completion Reports)
	Total depths (ft)	
Domestic	Range 24 – 633	Average: 135 (1,667 Well Completion Reports)
Municipal/Irrigation	Range 27 –780	Average: 246 (822 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels.	29 wells semi-annually
DWR	Miscellaneous water quality	7 wells biiennially
Department of Health Services	Miscellaneous water quality	30

Basin Management

Groundwater management:	Tehama County adopted a groundwater management ordinance in 1994. Tehama County adopted a countywide AB3030 plan in 1996.
Water agencies	
Public	Tehama County Flood Control and Water Conservation District adopted a Coordinated AB 3030 Plan, Orland Unit Water Users' Association, Capay Rancho WD, City of Corning, Corning WD, Kirkwood WD, Richfield WD, Tehama WD, O'Connell MWD, City of Orland, Glenn Colusa ID, Thomes Creek WD
Private	

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Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

ATTACHMENT J

Report for comparing District water use reports with the "Weekly Soil Moisture Loss Reports"

Weekly Soil Moisture Loss Reports Are Available to Corning Water District Water Users to Assist Farm Water Management

Written by Allan Fulton, Gene Pixley, and Jim Lowden

Introduction

For the 2005 season, the Northern District of the California Department of Water Resources (DWR) and the University of California Cooperative Extension (CE) in Red Bluff have teamed up with Corning Water District (CWD) to provide **"Weekly Soil Moisture Loss Reports"** to water users in the district. This bulletin refers to an enclosed copy of the most recent report **(see yellow sheet)** for the week of July 1 to July 7, 2009. It highlights the information provided and outlines possible ways to use it to aid water management.

About the First table: "Soil Moisture Loss in Inches" (yellow sheet)

- Provides estimate of soil evaporation and plant consumption for seven major irrigated crops in the district
- Gives crop water use for the past seven days and accumulated use during the season **since March 1, 2005 or a specified leafout date**
- Estimates are for farmlands west and east of the Sacramento River to recognize variations in weather
- Estimates labeled **"West of the Sacramento River"** are representative of Corning Water District because soil moisture loss is based on weather measurements taken near Gerber Avenue and Highway 99 West
- Estimates labeled **"East of the Sacramento River"** are based on weather measurements taken near Durham
- Estimates are based upon hourly measurements of sunlight, relative humidity, wind, and rainfall
- Estimates are for healthy crops and where soil moisture is not limiting crop growth
- Estimates are for bearing orchards (typically fifth leaf or older)
- Estimates for non-bearing orchards can be made but are not given in this report
- Will overestimate irrigation needs for unhealthy trees, non-bearing trees, or where water stress may be beneficial
- Estimates suggest a maximum amount of irrigation water needed and should be confirmed in the field
- Weekly and accumulated rainfall (since March 1) from the Gerber and Durham weather stations are reported

About the Second Table: "Estimate of Applied Water Needed" (yellow sheet)

- A reminder, irrigation systems that apply water with a high uniformity require less water to supply the crop needs in all areas of the field or orchard

When and Where are these Weekly Soil Moisture Loss Reports Available?

The reports are available on a weekly basis through several venues from April through October

- Red Bluff Daily News – Every Saturday in the "Agriculture Section"
- Corning Observer – Every Wednesday
- Available at http://www.nd.water.ca.gov/Data/index.cfm Choose "Weekly Soil Moisture Loss and Applied Water Data" section
- Updated on the web each Friday at: http://cetehama.ucdavis.edu Select *Irrigation and Water Resources Section* and then select *Real-time Crop ET* from menu listed on the left
- Available via a weekly e-mail report each Friday. To sign-up, send e-mail request to aefulton@ucdavis.edu

Reporting Units and Useful Conversion Factors:

- The actual reporting units in both tables are acre-inches per acre. To simplify, the acre units cancel out and inches are only reported.
- The reporting unit "inches" are the same as commonly used to report rainfall
- Estimates of soil moisture loss reported in inches can be easily converted to feet (acre-feet per acre) by dividing the soil moisture loss estimates by twelve because an acre-foot equals twelve acre-inches.
- One inch (acre-inch per acre) of water equals 27,154 gallons
- One foot (acre-foot per acre) equals 325,851 gallons

Use Once a Month to Compare Soil Moisture Loss Reports to District's Monthly Usage Reports

- About the 10th of each month Corning Water District provides each customer with a "Summary Usage Report" for the previous month that has been measured through metered turnouts **(see blue sheet – June 2005)**
- The average volume of water applied to each field per acre per month is provided in **the last column**
- Keep a running total during the irrigation season of the average volume of water applied per acre for each field. This may require some hand calculations or computer spreadsheet work once a month.
- At the same time, maintain a file of the weekly soil moisture loss reports.
- When you receive the district's monthly usage report, refer to your file of weekly soil moisture loss reports, use the weekly report corresponding closest to the end of the month in question. For example, refer to the yellow sheet that has been provided titled "Soil Moisture Loss Report for July 1 through July 7, 2005.
- From this report, under **"West of Sacramento River"** select the crop of interest and note the amount of soil moisture loss in inches that has been reported under the column titled **"Accumulated Seasonal Use".**
- **Divide** the accumulated soil moisture loss in inches for the season **by twelve** to convert the soil moisture loss to feet (acre-feet per acre).
- Compare the accumulated soil moisture loss to your running total of monthly usage provided by Corning Water District.

Use in the Spring Season to Help Decide When to Begin the Irrigation Season

- 2005 provides a good example for using the weekly soil moisture loss reports to help decide when irrigation should begin or even temporarily suspended when rainfall is sufficient
- Refer to the **"yellow sheet".** Select the crop in question. Compare the **"Accumulated Seasonal Use"** since March 1, 2005 to the **"Accumulated Rainfall"** since March 1, 2005
- **Example:** accumulated seasonal use for walnut from April 1 through July 7, 2005 is 18.26 inches while accumulated rainfall from the Gerber station for the same period was 6.41 inches indicating a soil moisture deficit of 11.85 inches that should be supplied with irrigation. Earlier reports for May 19 and 26 showed the deficit began to accrue about May 19 and limited irrigation might have been initiated about May 27.
- Checking earlier, weekly reports of soil moisture loss dating back to April 15 would have been more helpful in deciding when to begin irrigation in other orchard crops with earlier leafout dates.
- Rainfall measurements taken from your own ranch will improve the accuracy of this projection

Use throughout the Season to Aid Irrigation Operation

- Crops go through phases of growth and the weather can be highly variable. It stands to reason that a fixed irrigation schedule (for example: irrigating every three days once irrigation begins) may not be effective.
- A count of microsprinklers or drip emitters per acre is needed and a reliable estimate of the water emission rate per microsprinkler or dripper is needed to project the weekly hours of irrigation needed
- **Example**: one microsprinkler is used per almond tree; a typical microsprinkler emits nine gallons of water per hour; and the orchard design has 151 trees per acre. So, the average **hourly** water application rate for this example is 1359 gallons per acre. This equates to a water application rate or precipitation rate of 0.05 inches per hour of operation (1.0 acre-inch equals 27,154 gallons, refer to units section).
- Referring to the **"yellow sheet"** the weekly water use for almond (west of river) from July 1 to July 7, 2005 was 1.76 inches.
- Additional water is needed to compensate for non-uniform application of water. Field evaluations conducted by the Tehama County Irrigation Mobile Lab suggest 10 to 20 percent more water may be necessary. Table 2 suggests that 2.0 inches of water is needed to replenish the past week of crop water use, if irrigation efficiency is 90 percent. This equates to 40 hours of irrigation, not applied all at once, to replenish the past seven days of crop water use.

Have Questions or Looking for More Assistance?

Contact: Allan Fulton, UC Farm Advisor, 527-3101 or aefulton@ucdavis.edu
Contact: Mark Rivera, California Department of Water Resources, Northern District, 529-7301
Contact: Tehama County Resource Conservation District Irrigation Mobile Lab, 527-3013 x 119

ATTACHMENT K

Growers Monthly Water Order Form
Daily water orders can be submitted by phone 24 hours per day.

FAX TO:	824-6379			FARMS			2009
CORNING WATER DISTRICT			FAX WATER REQUEST				
FIELD OR METER NO.	MON	TUE	WED	THURS	FRI	SAT	SUN

		MONTHLY WATER ORDERS		NAME:	Grower's Name			PHONE	209-337-5533	
		CORNING WATER DIST				MAY				2008
SYS	MN		GPM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
								1	2	3
C4	2340	HOUSE	65							
C4	1128	SAMSON	120							
C4	2480	PATTON EAST	700							
C4	2480	PATTON WEST	700							
C5	2290	FOLEY	1000							
C5	2290	FOLEY	1000							
C10	2098	99 HWY	200							
C10	1020	POWERS	80							
C10	2130	DORA	200							
C10	2650	DONNA MIRALDA	250							
C10	2560	VIOLA	300							
C4	9333	CARLSON	300							
				4	5	6	7	8	9	10
C4	2340	HOUSE	65							
C4	1128	SAMSON	120							
C4	2480	PATTON EAST	700							
C4	2480	PATTON WEST	700							
C5	2290	FOLEY	1000							
C5	2290	FOLEY	1000							
C10	2098	99 HWY	200							
C10	1020	POWERS	80							
C10	2130	DORA	200							
C10	2650	DONNA MIRALDA	250							
C10	2560	VIOLA	300							
C4	9333	CARLSON	300							
				11	12	13	14	15	16	17
C4	2340	HOUSE	65							
C4	1128	SAMSON	120							
C4	2480	PATTON EAST	700							
C4	2480	PATTON WEST	700							
C5	2290	FOLEY	1000							
C5	2290	FOLEY	1000							
C10	2098	99 HWY	200							
C10	1020	POWERS	80							
C10	2130	DORA	200							
C10	2650	DONNA MIRALDA	250							
C10	2560	VIOLA	300							
C4	9333	CARLSON	300							
				18	19	20	21	22	23	24
C4	2340	HOUSE	65							
C4	1128	SAMSON	120							
C4	2480	PATTON EAST	700							
C4	2480	PATTON WEST	700							
C5	2290	FOLEY	1000							
C5	2290	FOLEY	1000							
C10	2098	99 HWY	200							
C10	1020	POWERS	80							
C10	2130	DORA	200							
C10	2650	DONNA MIRALDA	250							
C10	2560	VIOLA	300							
C4	9333	CARLSON	300							
				25	26	27	28	29	30	31
C4	2340	HOUSE	65							
C4	1128	SAMSON	120							
C4	2480	PATTON EAST	700							
C4	2480	PATTON WEST	700							
C5	2290	FOLEY	1000							
C5	2290	FOLEY	1000							
C10	2098	99 HWY	200							
C10	1020	POWERS	80							
C10	2130	DORA	200							
C10	2650	DONNA MIRALDA	250							
C10	2560	VIOLA	300							
C4	9333	CARLSON	300							