

Drinking Water Source Assessment

Water System

Palomino Lakes Mutual Water Co.

Sonoma County

Water Source

WELL 01

Assessment Date

July, 2001

California Department of Health Services
Drinking Water Field Operations Branch
DHS Sonoma District

District No.	18
System No.	4900570
Source No.	001
PS Code	4900570-001

Assessment Summary

District Name DHS Sonoma District **District No.** 18 **County** Sonoma
System Name Palomino Lakes Mutual Water Co. **System No.** 4900570
Source Name WELL 01 **Source No.** 001 **PS Code** 4900570-001

Completed by Robert Brownwood **Date** July, 2001

According to DHS records, this Source is Groundwater. This Assessment was done using the Default Groundwater System Method.

Description of System and Source

The Palomino Lakes Mutual Water Co. water system is located in Sonoma County and serves the Palomino Lakes Subdivision. There are approximately 106 service connections serving a population of 250.

The drinking water source for the Palomino Lakes Mutual Water Co. water system is Well No. 1 located approximately 1000 feet from the Russian River, near Asti.

Assessment Procedures

The assessment of the source WELL 01 was conducted by the Department of Health Services, Sonoma District Office. The following sources of information were used in the assessment: DHS files and an inspection of the water system.

Procedures used to conduct the assessment include: Turbo Swap

Contents of this Assessment

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Assessment Summary
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Vulnerability Summary
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Source Location Form
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Delineation of Water Protection Zones
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Physical Barrier Effectiveness Checklist
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Source Data Sheet
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Inventory of Possible Contaminating Activities
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Vulnerability Ranking
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Assessment Map

Vulnerability SummaryDistrict Name DHS Sonoma District District No. 18 County SonomaSystem Name Palomino Lakes Mutual Water Co. System No. 4900570Source Name WELL 01 Source No. 001 PS Code 4900570-001Completed by Robert Brownwood Date July, 2001**THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE**A source water assessment was conducted for the WELL 01of the Palomino Lakes Mutual Water Co. water system in July, 2001.

The source is considered most vulnerable to the following activities not associated with any detected contaminants:

Agricultural Drainage
Mining - Sand/Gravel
Septic systems - low density [<1 /acre]
Wells - Agricultural/ Irrigation

A copy of the complete assessment may be viewed at:

Drinking Water Field Operations Branch
50 D Street, Suite 200
Santa Rosa, CA 95404

You may request a summary of the assessment be sent to you by contacting:

Office Representative
(707) 576-2145
(707) 576-2722 (fax)

Delineation of Water Protection Zones

District Name DHS Sonoma District District No. 18 County Sonoma
 System Name Palomino Lakes Mutual Water Co. System No. 4900570
 Source Name WELL 01 Source No. 001 PS Code 4900570-001

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Method Used to Delineate Protection Zones

X 1. Calculated Fixed Radius

2. Modified Calculated Fixed Radius (Attach documentation for direction of ground water flow.)
3. More Detailed Methods
4. Arbitrary Fixed Radius (For use only by or permission of DHS)

Maximum Pumping Rate of Well (Q) 190 gallons/minute
306 acre feet/year
13,350,730 cubic feet/year

Effective Porosity 0.20 Default Value

Screened Interval of Well 10 feet Default Value

Protection Zone	Calculated Value	Minimum Value	Radius of Protection Zone
Zone A - 2 Year TOT*	2,061 Feet	600 Feet	2,061 Feet
Zone B5 - 5 Year TOT*	3,259 Feet	1,000 Feet	3,259 Feet
Zone B10 - 10 Year TOT*	4,610 Feet	1,500 Feet	4,610 Feet

*TOT = Time of Travel

Physical Barrier Effectiveness (PBE)

District Name DHS Sonoma District District No. 18 County Sonoma
 System Name Palomino Lakes Mutual Water Co. System No. 4900570
 Source Name WELL 01 Source No. 001 PS Code 4900570-001

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Parameter	Possible Points	This Source	Score
Type of Aquifer Confinement			
1. Unconfined, Semi-confined, Fractured Rock, Unknown Aquifer	0	X	0
2. Confined	50		
Aquifer Material (Unconfined Aquifers)			
Type of material within aquifer			
1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A	20		
2. Porous Media (Interbedded sands, silts, clays, gravels)	10	X	10
3. Fractured rock (Low Physical Barrier Effectiveness - no further questions required)	0		
Pathways of Contamination (All Aquifers)			
Presence of Abandoned or Improperly Destroyed Wells			
1. Present within Zone A (2 year TOT distance)	Yes	0	
	No	5	
	Unknown	0	X
2. Present within Zone B5 (2 -5 year TOT distance)	Yes	0	
	No	3	
	Unknown	0	X
3. Present within Zone B10 (5-10 year TOT distance)	Yes	0	
	No	2	
	Unknown	0	X
Static Water Conditions (Unconfined Aquifers)			
Depth to Static Water (DTW) <u>10</u> feet	0 to 20 feet	0	X
	20 to 50 feet	2	
	50 to 100 feet	6	
	Greater than 100 feet	10	
	Unknown	0	
Well Operation (Unconfined Aquifers)			
Depth to Uppermost Perforations (DUP) <u>10</u> feet			
Maximum Pumping Rate of Well (Q) <u>190</u> gallons/minute			
Length of Screened Interval (H) <u>10</u> feet	Less than 5	0	X
	Between 5 and 10	5	
	Greater than 10	10	
	Unknown	0	
	[DUP - DTW / Q/H] <u>0.00</u>		

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Parameter	Possible Points	This Source	Score
Well Construction (All Aquifers)			
Sanitary Seal (Annular Seal) Depth <u>4</u> feet	None or less than 20 feet	X	0
	Between 20 and 50 feet		
	50 feet or greater		
	Unknown		
Surface Seal (concrete cap)	Not present or improperly constructed	X	0
	Watertight, slopes away from well at least 2' laterally in all directions		
	Unknown		
Flooding potential at well site	Subject to localized flooding (i.e. in low area or unsealed pit or vault) or within 100 year flood plain	X	0
	Not subject to flooding		
	Unknown		
Security at well site	Not secure		
	Secure	X	5
	Unknown		

Score	Effectiveness
0 to 35	Low
36 to 69	Moderate
70 to 100	High

Maximum Score = 70

Score	<u>15</u>
Effectiveness	<u>Low</u>

Inventory of Possible Contaminating Activities (PCA Inventory)

District Name DHS Sonoma District **District No.** 18 **County** Sonoma
System Name Palomino Lakes Mutual Water Co. **System No.** 4900570
Source Name WELL 01 **Source No.** 001 **PS Code** 4900570-001

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Residential/Municipal Activities					
Airports - Maintenance/fueling areas (VH)	N	N	N		
Landfills/dumps (VH)	N	N	N		
Railroad yards/maintenance/fueling areas (H)	U	U	U		
Septic systems - high density [>1/acre] (VH in Zone A, otherwise M)	N	Y	Y		
Sewer collection systems (H in Zone A, otherwise L)	N	N	N		
Utility stations - maintenance areas (H)	N	U	U		
Wastewater treatment plants (VH in Zone A, otherwise H)	N	N	N		
Drinking water treatment plants (M)	N	N	N		
Golf courses (M)	N	N	N		
Housing - high density [>1 house/0.5 acres] (M)	Y	Y	Y		
Motor pools (M)	N	U	U		
Parks (M)	N	N	N		
Waste transfer/recycling stations (M)	N	N	N		
Apartments and condominiums (L)	N	N	N		
Campgrounds/Recreational areas (L)	N	U	U		
Fire stations (L)	N	U	U		
RV Parks (L)	N	U	U		
Schools (L)	N	Y	U		
Hotels, Motels (L)	N	U	U		
Agricultural/Rural Activities					
Grazing [> 5 large animals or equivalent per acre] (H in Zone A, otherwise M)	U	U	U		
Concentrated Animal Feeding Operations [CAFOs] as defined in federal regulation1 (VH in Zone A, otherwise M)	N	U	U		
Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H)	N	N	N		
Other Animal operations (H in Zone A, otherwise M)	N	N	N		
Farm chemical distributor/ application service (H)	N	N	N		
Farm machinery repair (H)	U	U	U		
Septic systems - low density [<1/acre] (H in Zone A, otherwise L)	Y	Y	Y		

Y = Yes N = No U = Unknown
*** = A contaminant potentially associated with this activity has been detected in the water supply.**

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Agricultural/Rural Activities					
Lagoons/liquid wastes (H)	U	U	U		
Machine shops (H)	N	U	U		
Pesticide/fertilizer/petroleum storage & transfer areas (H)	U	U	U		
Agricultural Drainage (H in Zone A, otherwise M)	Y	Y	Y		
Wells - Agricultural/ Irrigation (H)	Y	Y	Y		
Managed Forests (M)	U	U	U		
Crops, irrigated [Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable] (M)	Y	Y	Y		
Fertilizer/Pesticide/Herbicide Application (M)	Y	Y	Y		
Sewage sludge/biosolids application (M)	N	N	N		
Crops, nonirrigated [e.g., Christmas trees, grains, grass seeds, hay, pasture] [includes drip-irrigated crops] (L)	U	U	U		
Other Activities					
NPDES/WDR permitted discharges (H)	U	U	U		
Underground Injection of Commercial/Industrial Discharges (VH)	U	U	U		
Historic gas stations (VH)	U	U	U		
Historic waste dumps/landfills (VH)	U	U	U		
Illegal activities/unauthorized dumping (H)	U	U	U		
Injection wells/dry wells/ sumps (VH)	U	U	U		
Known Contaminant Plumes (VH)	N	N	N		
Military installations (VH)	N	N	N		
Mining operations - Historic (VH)	U	U	U		
Mining operations - Active (VH)	U	U	U		
Mining - Sand/Gravel (H)	Y	Y	Y		
Wells - Oil, Gas, Geothermal (H)	U	U	U		
Salt Water Intrusion (H)	N	N	N		
Recreational area - surface water source (H)	N	N	N		
Underground storage tanks - Confirmed leaking tanks (VH)	U	U	U		
Underground storage tanks - Decommissioned - inactive tanks (L)	U	U	U		

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Other Activities					
Underground storage tanks - Non-regulated tanks [tanks smaller than regulatory limit] (H)	U	U	U		
Underground storage tanks - Not yet upgraded or registered tanks (H)	U	U	U		
Underground storage tanks - Upgraded and/or registered - active tanks (L)	U	U	U		
Above ground storage tanks (M)	U	U	U		
Wells - Water supply (M)	Y	Y	Y		
Construction/demolition staging areas (M)	N	N	N		
Contractor or government agency equipment storage yards (M)	N	U	U		
Dredging (M)	N	N	N		
Transportation corridors - Freeways/state highways (M)	N	N	Y		
Transportation corridors - Railroads (M)	N	Y	Y		
Transportation corridors - Historic railroad right-of-ways (M)	Y	Y	Y		
Transportation corridors - Road Right-of-ways [herbicide use areas] (M)	Y	Y	Y		
Transportation corridors - Roads/Streets (L)	Y	Y	Y		
Hospitals (M)	N	N	N		
Storm Drain Discharge Points (M)	N	N	N		
Storm Water Detention Facilities (M)	N	N	N		
Artificial Recharge Projects - Injection wells [potable water] (L)	N	N	N		
Artificial Recharge Projects - Injection wells [non-potable water] (M)	N	N	N		
Artificial Recharge Projects - Spreading Basins [potable water] (L)	N	N	N		
Artificial Recharge Projects - Spreading Basins [non-potable water] (M)	N	N	N		
Medical/dental offices/clinics (L)	N	N	N		
Veterinary offices/clinics (L)	N	U	U		
Surface water - streams/lakes/streams (L)	Y	Y	Y		
Wells - monitoring, test holes (L)	U	U	U		

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Vulnerability Ranking

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Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
A	Agricultural Drainage (H in Zone A, otherwise M)		5	5	5	15
A	Mining - Sand/Gravel (H)		5	5	5	15
A	Septic systems - low density [<1/acre] (H in Zone A, otherwise L)		5	5	5	15
A	Wells - Agricultural/ Irrigation (H)		5	5	5	15
A	Crops, irrigated [Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable] (M)		3	5	5	13
A	Fertilizer/Pesticide/Herbicide Application (M)		3	5	5	13
A	Housing - high density [>1 house/0.5 acres] (M)		3	5	5	13
A	Transportation corridors - Historic railroad right-of-ways (M)		3	5	5	13
A	Transportation corridors - Road Right-of-ways [herbicide use areas] (M)		3	5	5	13
A	Wells - Water supply (M)		3	5	5	13
B5	Mining - Sand/Gravel (H)		5	3	5	13
B5	Wells - Agricultural/ Irrigation (H)		5	3	5	13
A	Historic gas stations (VH)		7	0	5	12
A	Historic waste dumps/landfills (VH)		7	0	5	12
A	Injection wells/dry wells/ sumps (VH)		7	0	5	12
A	Mining operations - Active (VH)		7	0	5	12
A	Mining operations - Historic (VH)		7	0	5	12
A	Underground Injection of Commercial/Industrial Discharges (VH)		7	0	5	12
A	Underground storage tanks - Confirmed leaking tanks (VH)		7	0	5	12
B5	Historic gas stations (VH)		7	0	5	12
B5	Historic waste dumps/landfills (VH)		7	0	5	12
B5	Injection wells/dry wells/ sumps (VH)		7	0	5	12
B5	Mining operations - Active (VH)		7	0	5	12
B5	Mining operations - Historic (VH)		7	0	5	12
B5	Underground Injection of Commercial/Industrial Discharges (VH)		7	0	5	12
B5	Underground storage tanks - Confirmed leaking tanks (VH)		7	0	5	12
B10	Historic gas stations (VH)		7	0	5	12
B10	Historic waste dumps/landfills (VH)		7	0	5	12
B10	Injection wells/dry wells/ sumps (VH)		7	0	5	12

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Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
B10	Mining operations - Active (VH)		7	0	5	12
B10	Mining operations - Historic (VH)		7	0	5	12
B10	Underground Injection of Commercial/Industrial Discharges (VH)		7	0	5	12
B10	Underground storage tanks - Confirmed leaking tanks (VH)		7	0	5	12
A	Surface water - streams/lakes/ivers (L)		1	5	5	11
A	Transportation corridors - Roads/Streets (L)		1	5	5	11
B5	Agricultural Drainage (H in Zone A, otherwise M)		3	3	5	11
B5	Crops, irrigated [Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable] (M)		3	3	5	11
B5	Fertilizer/Pesticide/Herbicide Application (M)		3	3	5	11
B5	Housing - high density [>1 house/0.5 acres] (M)		3	3	5	11
B5	Septic systems - high density [>1/acre] (VH in Zone A, otherwise M)		3	3	5	11
B5	Transportation corridors - Historic railroad right-of-ways (M)		3	3	5	11
B5	Transportation corridors - Railroads (M)		3	3	5	11
B5	Transportation corridors - Road Right-of-ways [herbicide use areas] (M)		3	3	5	11
B5	Wells - Water supply (M)		3	3	5	11
B10	Mining - Sand/Gravel (H)		5	1	5	11
B10	Wells - Agricultural/ Irrigation (H)		5	1	5	11
A	Farm machinery repair (H)		5	0	5	10
A	Grazing [> 5 large animals or equivalent per acre] (H in Zone A, otherwise M)		5	0	5	10
A	Illegal activities/unauthorized dumping (H)		5	0	5	10
A	Lagoons/liquid wastes (H)		5	0	5	10
A	NPDES/WDR permitted discharges (H)		5	0	5	10
A	Pesticide/fertilizer/petroleum storage & transfer areas (H)		5	0	5	10
A	Railroad yards/maintenance/fueling areas (H)		5	0	5	10
A	Underground storage tanks - Non-regulated tanks [tanks smaller than regulatory limit] (H)		5	0	5	10
A	Underground storage tanks - Not yet upgraded or registered tanks (H)		5	0	5	10
A	Wells - Oil, Gas, Geothermal (H)		5	0	5	10

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Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
B5	Concentrated Animal Feeding Operations [CAFOs] as defined in federal regulation ¹ (VH in Zone A, otherwise H)		5	0	5	10
B5	Farm machinery repair (H)		5	0	5	10
B5	Illegal activities/unauthorized dumping (H)		5	0	5	10
B5	Lagoons/liquid wastes (H)		5	0	5	10
B5	Machine shops (H)		5	0	5	10
B5	NPDES/WDR permitted discharges (H)		5	0	5	10
B5	Pesticide/fertilizer/petroleum storage & transfer areas (H)		5	0	5	10
B5	Railroad yards/maintenance/fueling areas (H)		5	0	5	10
B5	Underground storage tanks - Non-regulated tanks [tanks smaller than regulatory limit] (H)		5	0	5	10
B5	Underground storage tanks - Not yet upgraded or registered tanks (H)		5	0	5	10
B5	Utility stations - maintenance areas (H)		5	0	5	10
B5	Wells - Oil, Gas, Geothermal (H)		5	0	5	10
B10	Concentrated Animal Feeding Operations [CAFOs] as defined in federal regulation ¹ (VH in Zone A, otherwise H)		5	0	5	10
B10	Farm machinery repair (H)		5	0	5	10
B10	Illegal activities/unauthorized dumping (H)		5	0	5	10
B10	Lagoons/liquid wastes (H)		5	0	5	10
B10	Machine shops (H)		5	0	5	10
B10	NPDES/WDR permitted discharges (H)		5	0	5	10
B10	Pesticide/fertilizer/petroleum storage & transfer areas (H)		5	0	5	10
B10	Railroad yards/maintenance/fueling areas (H)		5	0	5	10
B10	Underground storage tanks - Non-regulated tanks [tanks smaller than regulatory limit] (H)		5	0	5	10
B10	Underground storage tanks - Not yet upgraded or registered tanks (H)		5	0	5	10
B10	Utility stations - maintenance areas (H)		5	0	5	10
B10	Wells - Oil, Gas, Geothermal (H)		5	0	5	10
B5	Schools (L)		1	3	5	9
B5	Septic systems - low density [<1/acre] (H in Zone A, otherwise L)		1	3	5	9
B5	Surface water - streams/lakes/rivers (L)		1	3	5	9

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Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
B5	Transportation corridors - Roads/Streets (L)		1	3	5	9
B10	Agricultural Drainage (H in Zone A, otherwise M)		3	1	5	9
B10	Crops, irrigated [Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable] (M)		3	1	5	9
B10	Fertilizer/Pesticide/Herbicide Application (M)		3	1	5	9
B10	Housing - high density [>1 house/0.5 acres] (M)		3	1	5	9
B10	Septic systems - high density [>1/acre] (VH in Zone A, otherwise M)		3	1	5	9
B10	Transportation corridors - Freeways/state highways (M)		3	1	5	9
B10	Transportation corridors - Historic railroad right-of-ways (M)		3	1	5	9
B10	Transportation corridors - Railroads (M)		3	1	5	9
B10	Transportation corridors - Road Right-of-ways [herbicide use areas] (M)		3	1	5	9
B10	Wells - Water supply (M)		3	1	5	9
A	Above ground storage tanks (M)		3	0	5	8
A	Managed Forests (M)		3	0	5	8
B5	Above ground storage tanks (M)		3	0	5	8
B5	Contractor or government agency equipment storage yards (M)		3	0	5	8
B5	Grazing [> 5 large animals or equivalent per acre] (H in Zone A, otherwise M)		3	0	5	8
B5	Managed Forests (M)		3	0	5	8
B5	Motor pools (M)		3	0	5	8
B10	Above ground storage tanks (M)		3	0	5	8
B10	Contractor or government agency equipment storage yards (M)		3	0	5	8
B10	Grazing [> 5 large animals or equivalent per acre] (H in Zone A, otherwise M)		3	0	5	8
B10	Managed Forests (M)		3	0	5	8
B10	Motor pools (M)		3	0	5	8

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