

September 12, 2005

John Scardino  
Woodlands Ventures, LLC  
31200 Via Colinas, Suite 200  
Westlake Village, California 91362

**SUBJECT: Summer 2005 Ground Water Elevation Monitoring Report for The Woodlands Development, Nipomo Mesa, San Luis Obispo County, California**

Dear Mr. Scardino:

This report documents the monitoring of water levels at eleven wells in the vicinity of The Woodlands project and at the six wells on The Woodlands property. This work has been performed as part of the mitigation program resulting from the project environmental impact report. Cleath & Associates has been monitoring water levels on a monthly basis on the Woodlands site since March 1999. Well locations are shown on Figure 1. All of the onsite wells and six of the offsite wells were surveyed by John L. Wallace & Associates in September 2003. The rest of the offsite wells including three new wells to be added to the monitoring program were surveyed by John L. Wallace & Associates on August 31, 2005.

### **Onsite Wells**

Four of the onsite wells were constructed as production wells for the project, with the Highway 1 Monitoring well and the Flintcote well utilized as monitoring wells only. The Highway 1 Monitoring well was installed prior to the production wells to identify the aquifer zones beneath the site, evaluate water quality in these zones, and to determine general design parameters for the production wells. The Flintcote well was drilled in 1944, and the five Woodlands project wells were drilled in 1993 and 1994.

Currently, ground water production is occurring at all four production wells. According to Steve Sievert of Coastal Earthmovers, Inc., permanent pumps have been installed in the Dawn, Mesa, and Highway 1 wells, with a temporary pump operating in the Homestead well. The permanent pump is scheduled to be installed in the Homestead well before the end of 2005. Flow meters with flow totalizers are currently being installed in the wells that have permanent pumps. A flow meter will be installed in the Homestead well following pump installation. Sounding tubes have been installed in three of the production wells to facilitate water level monitoring. A sounding tube in the Highway 1 Production well has not yet been installed.

Prior to installing flow meters, production volumes for each of the wells has been accomplished by hand tallies written by water truck drivers, and by flow meters located at a pump station that services onsite irrigation



systems. This production data will be available for reporting in the Winter 2006 Ground Water Elevation Monitoring Report by Cleath & Associates.


Ground water elevations for the onsite wells and monthly precipitation are shown on Figure 2. Seasonal water level fluctuations ranged between approximately 25 and 45 feet in the six onsite wells. The slightly declining average water levels indicated in the hydrograph is a result of changing climatic conditions in the area during the monitoring period. Because of higher than normal precipitation amounts and the resulting decrease in regional well pumping during the winter of 2004 - 2005, water levels were higher during the 2005 Spring and Summer monitoring period in each of the onsite wells with the exception of the Mesa well, than in the corresponding 2004 Spring and Summer period. Because of increased water demand as the site improvements are being completed, significant increases in pumping have occurred during the 2005 summer months. The response of ground water levels during late Summer and Fall to the increased pumping and the changes in site conditions will be documented in the Winter 2006 monitoring report.

The slightly higher average water levels measured during 1999 and 2000 of the monitoring program reflect the higher than normal precipitation of the mid and late 1990s. Average to below average annual precipitation occurred from the year 2000 through the winter of 2003 - 2004. Historically, water levels generally drop from February through September of each year, after which they recover and rise.

### **Offsite Wells**

Three domestic wells, 10Q, 15B2, and 15B5 have been added to the program during this monitoring period. 9K4, 15G1, 23E1, 10N, and 22H are currently used as domestic supply wells to single-family homes and are pumped on a regular basis. 10K, 10Q, 14N, and 22G wells have been inactive since monitoring began. 10R2 is used for domestic and irrigation supply, and has been pumped on a regular basis since the summer of 2003. 10F is unequipped. 15B2 and 15B5 are unequipped and are located on unimproved lots within a new home subdivision. Water levels in 15B2 and 15B5 were not measured during this monitoring period. Monitoring at 23E1 has been discontinued because of access problems. The 13 offsite wells are listed in Table 1.

Ground water elevations for the offsite wells are shown on Figure 3. Seasonal changes in depths to water prior to 2004 were approximately 15 and 23 feet in 14N and 15G1 respectively. From January 2005 to August 2005, water levels in 14N dropped nearly 18 feet, with a one month drop of 14 feet between July 2005 and August 2005. Water levels in 15G1 dropped 28 feet from February 2005 to August 2005 which was approximately the same amount of drop during the corresponding period in 2004. Water levels in 10F and 9K4 have shown the greatest amount of seasonal fluctuation of all the monitored off-site wells. Water levels in these wells dropped between 40 and 42 feet from January to August in both 2004 and 2005. Water levels in 10R2 well dropped 37 feet from February to August 2005, but because of continuous pumping during each of the monitoring events from June 2004 to the end of 2004, the seasonal water level drop during 2004 could



not be measured. The previous largest water level drop in 10R2 was 35 feet during 2003. Hydrographs of 22G, 22H, 10K, and 23E1 are relatively flat, compared to hydrographs of all the other wells which fluctuate in response to regional pumping. This data, and the relatively high water levels suggest that these wells have been completed within the unconfined dune sand aquifer, whereas other offsite and onsite wells were either completed within a deeper, confined aquifer, or completed within portions of both aquifers.

### **Ground Water Movement**

Estimated ground water flow directions and hydraulic gradients on the Woodlands property are shown in Figure 4 and Figure 5. Ground water during May 2005 is generally inferred to flow to the north at an estimated hydraulic gradient of 0.0024 vertical feet of head loss per horizontal foot of distance. Ground water during July 2005 is generally inferred to flow to the north-northeast at an estimated hydraulic gradient of 0.0026 vertical feet of head loss per horizontal foot of distance.

Wells used for the hydraulic gradient calculations represent the same or similar hydraulic pressure zones. Five onsite wells were used to calculate the hydraulic gradient for the May 2005 monitoring event. Because the Highway 1 Production well was pumping during the July 2005 monitoring event, the well was excluded from the hydraulic gradient calculations. The Highway 1 Monitoring well is completed within multiple pressure zones and therefore is not used in gradient calculations.

### **Conclusions and Recommendations**

There are 16 wells currently being monitored with two additional offsite wells to be incorporated into the monthly monitoring at the Woodlands project. There are six onsite wells and a new total of 12 offsite wells in the program. Based on observed water levels, there are two principal groups of aquifer zones being tapped by the various wells: shallow aquifers (unconfined) and deep aquifers (confined). Table 2 shows the aquifers penetrated by each well in the Woodlands monitoring program.

Cleath & Associates recommends the following:

- Abandonment of the Highway 1 monitoring well. The well was installed prior to the production wells to identify the aquifer zones beneath the site, evaluate water quality in these zones, and to determine general design parameters for the production wells. Because the well is completed across multiple aquifer zones, water levels do not compare well with other wells on the site that are completed within the deep zones only. The well should be abandoned in accordance with Department of Water Resources Water Well Standards, Section 23, Requirements for Destroying Wells.

- Installation of a flow meter with a totalizer in each of the onsite wells. The date of the meter installation should be recorded.
- Installation of a sounding tube in the Highway 1 Production well to facilitate water level monitoring.

Water level data sheets including depths to ground water, ground water elevations, and changes in water levels for each well are included as an attachment. If you have any questions regarding this letter report, please call our office.

Sincerely,



David R. Williams, RG 7715  
Associate Geologist

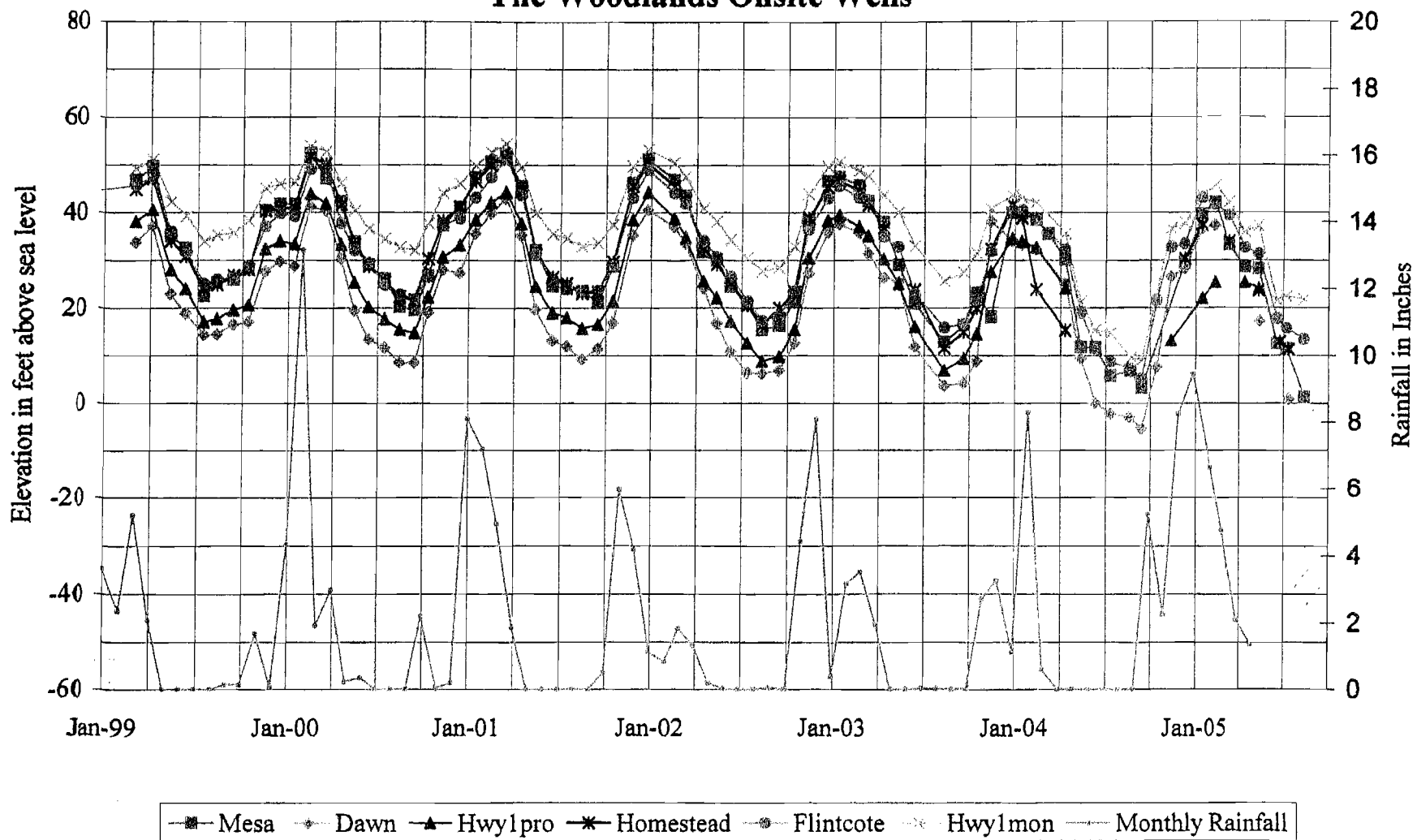
attachments

cc. Tom Whelan

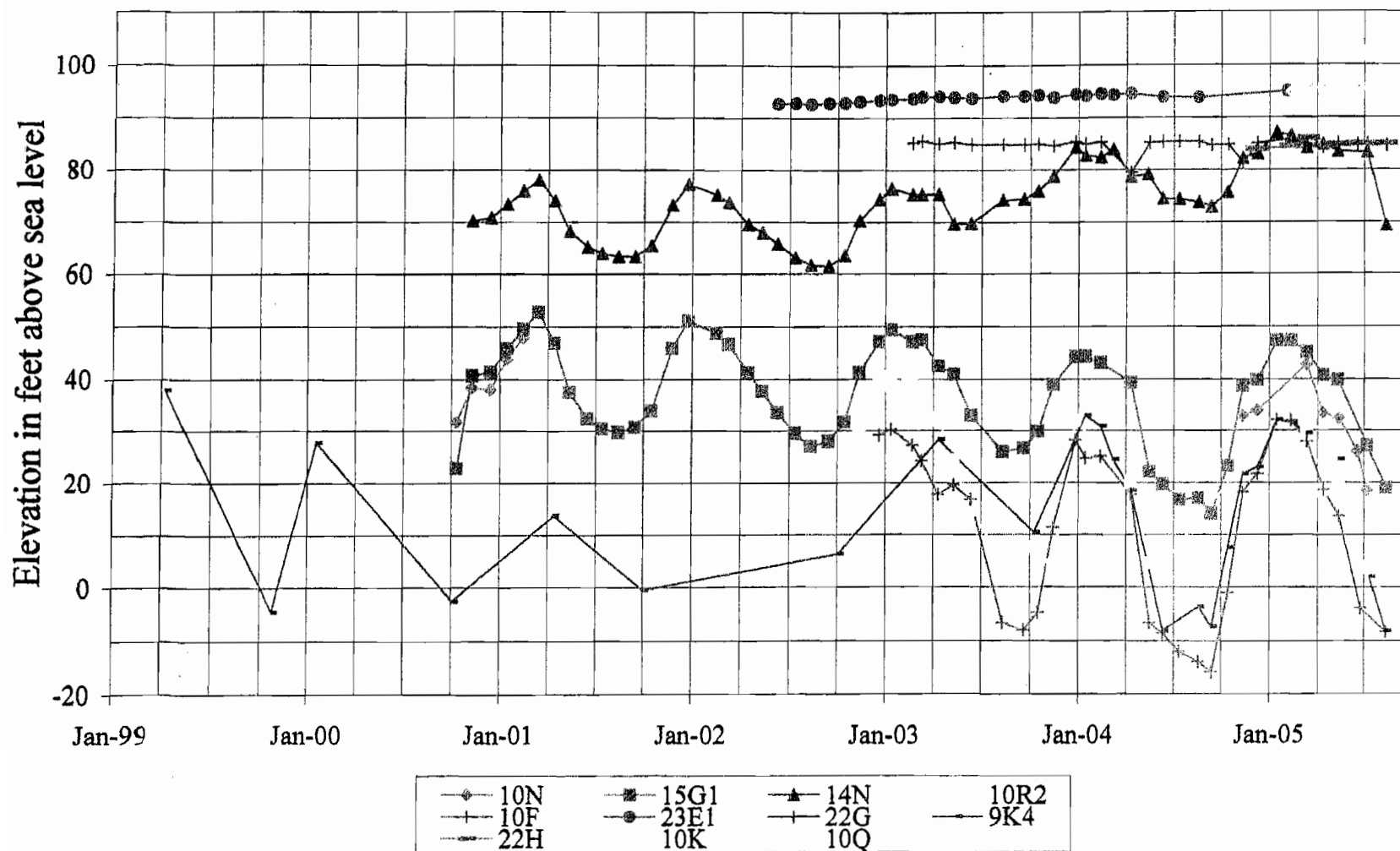
**Table 1  
Woodlands Offsite Wells**

Well Number	Reference Point	Total depth (in feet)	Well Type	Well Status	Date Monitoring Began	Drillers	Year Drilled	Comments
11N/35W-14N	Top of sounding tube (271.2)	--	Irrigation	Equipped, inactive	Nov-00	Floyd V. Wells	1975	
11N/35W-10F	Steel plate on top of casing (277.9)	600	School supply & Irrigation	Unequipped	Dec-03	Enloe Well Drilling	2002	Cascading water enters well at approximately 206 feet depth
11N/35W-10N	Top of casing (246.0)	360	Domestic	Active	Oct-00	Floyd V. Wells	1981	Discontinued Feb-01, Resumed monitoring in Nov-04
11N/35W-23E1	Top of casing (298.5)	460	Domestic	Active	Jun-03	Water Well Supply	1992	Discontinued Feb-05
11N/35W-22G	Top of casing (279.8)	--	Domestic	Equipped, inactive	Feb-03	--	--	
11N/35W-15G1	Top of sounding tube (234.8)	380	Domestic	Active	Oct-00	Water Well Supply	1985	Pump set at 225 feet depth
11N/35W-10R2	Top of casing (269.1)	365	Domestic / Irrigation	Active	Nov-03	Longwell	1956	Pumping often
11N/35W-9K4	Top of sounding port (County GPS=168.53)	--	Domestic	Active	Jan-2004 by Cleath & Associates	Floyd V. Wells	1960's	Monitored by County Public Works Dept. in October and April since 1973
11N/35W-10K	Top of casing (249.3)	210	Domestic	Unequipped	Feb-05	--	--	
11N/35W-22H	Top of casing (270.1)	--	Domestic	Active	Dec-04	--	--	
11N/35W-10Q	Top of casing (284.5)	--	Domestic	Inactive	May-05	--	--	
11N/35W-15B2	Concrete slab (250.9)	500	Domestic	Unequipped	Sep-05	Central Coast	2005	Unimproved lots
11N/35W-15B5	Concrete slab (259.3)	500	Domestic	Unequipped	Sep-05	Central Coast	2005	Unimproved lots

**Figure 2**  
**Water Levels: February 1999 - August 2005**  
**The Woodlands Onsite Wells**



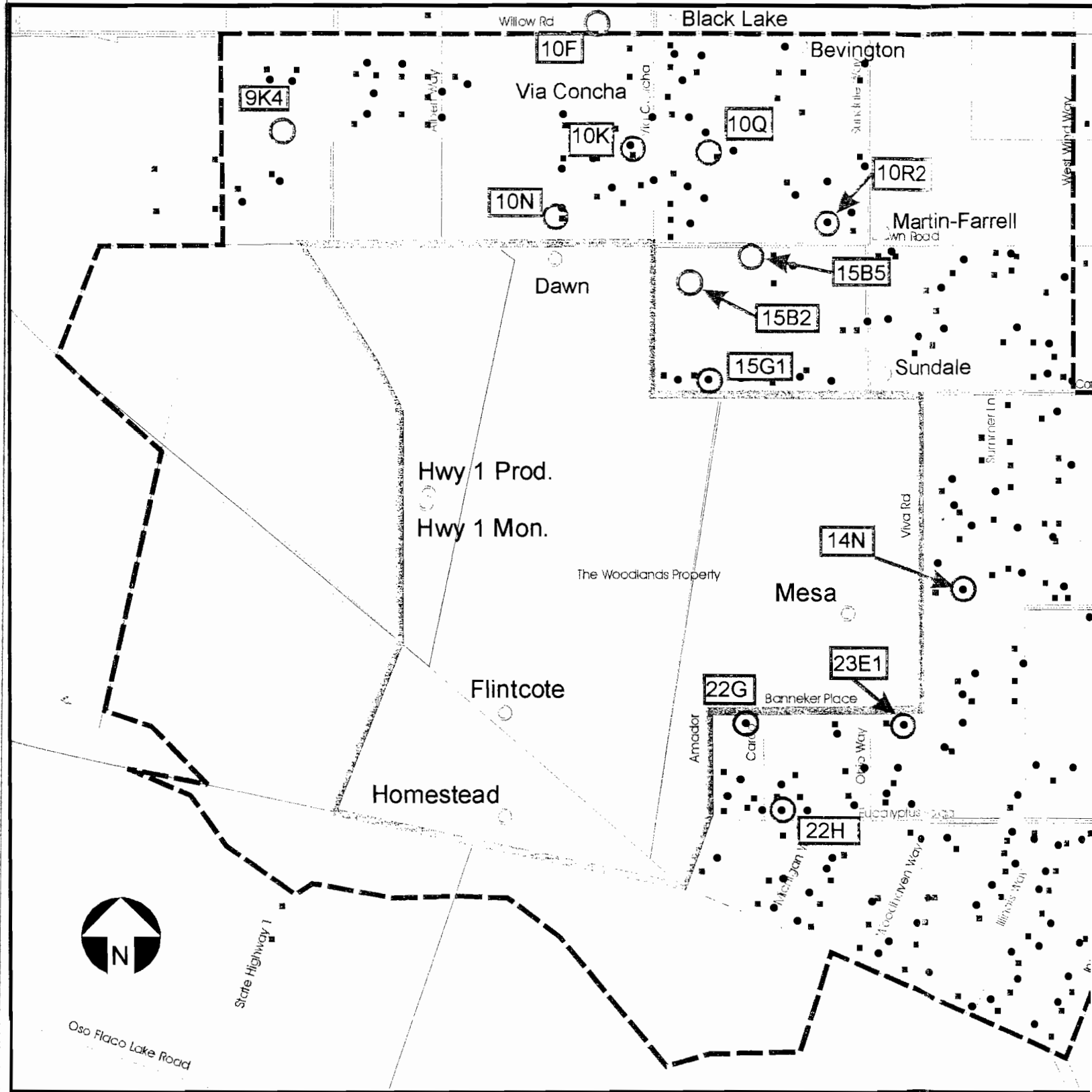
**Figure 3**  
**Water Levels: February 2005 to August 2005**  
**The Woodlands Offsite Wells**

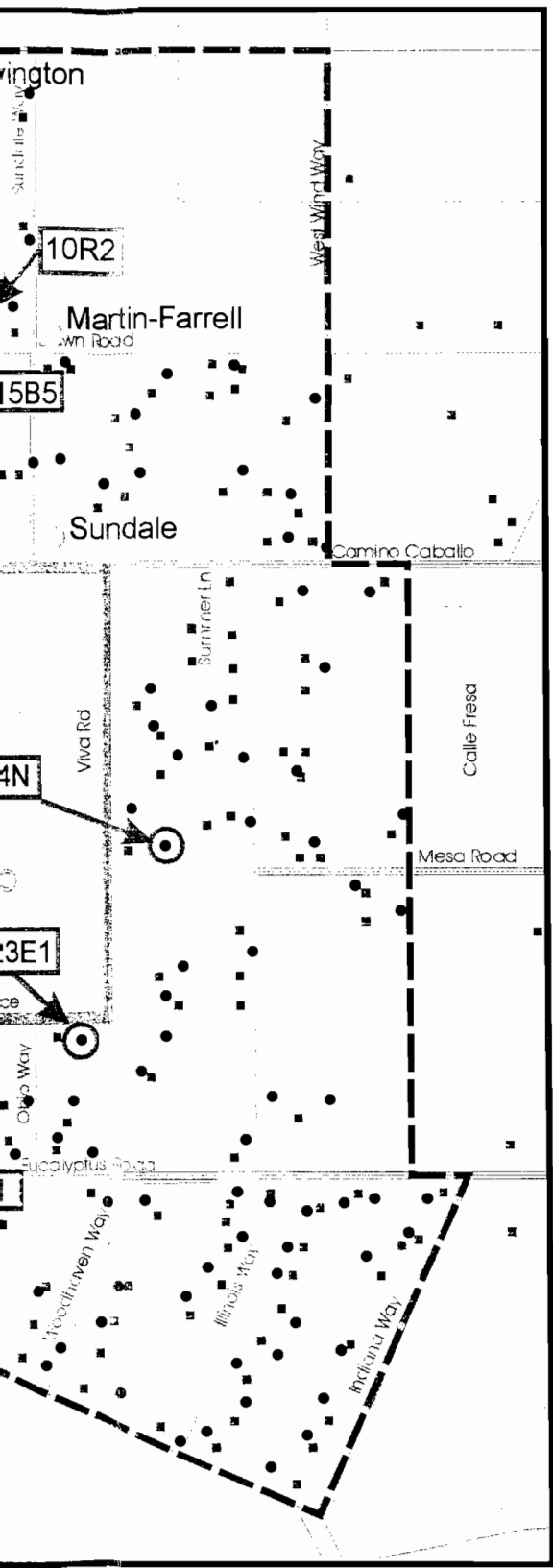


**Table 2****Aquifers Penetrated by Woodlands Onsite and Offsite Wells**

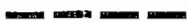
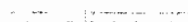






Well Name	Aquifer		
	Deep Aquifer (confined)	Shallow Aquifer (water table)	Mixed Aquifers
Mesa	X		
Dawn	X		
Hwy. 1 Production	X		
Hwy. 1 Monitoring			X
Homestead	X		
Flintcote	X		
14N			X
10F	X		
10N			X
23E1		X	
22G		X	
15G1			X
10R2			X
9K4			X
10K		X	
22H		X	
10Q		X	
15B2	X		
15B5	X		







**EXPLANATION:**

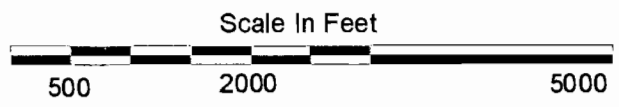
-  Impact Area Boundary
-  Site Boundary
-  Parcels with one or more domestic wells
-  Houses
-  Domestic Wells (Inferred)
-  Offsite Monitoring Well Location
-  Onsite Monitoring Well Location
-  Nipomo Community Services District well

All Wells Located in Township 11N Range 35W

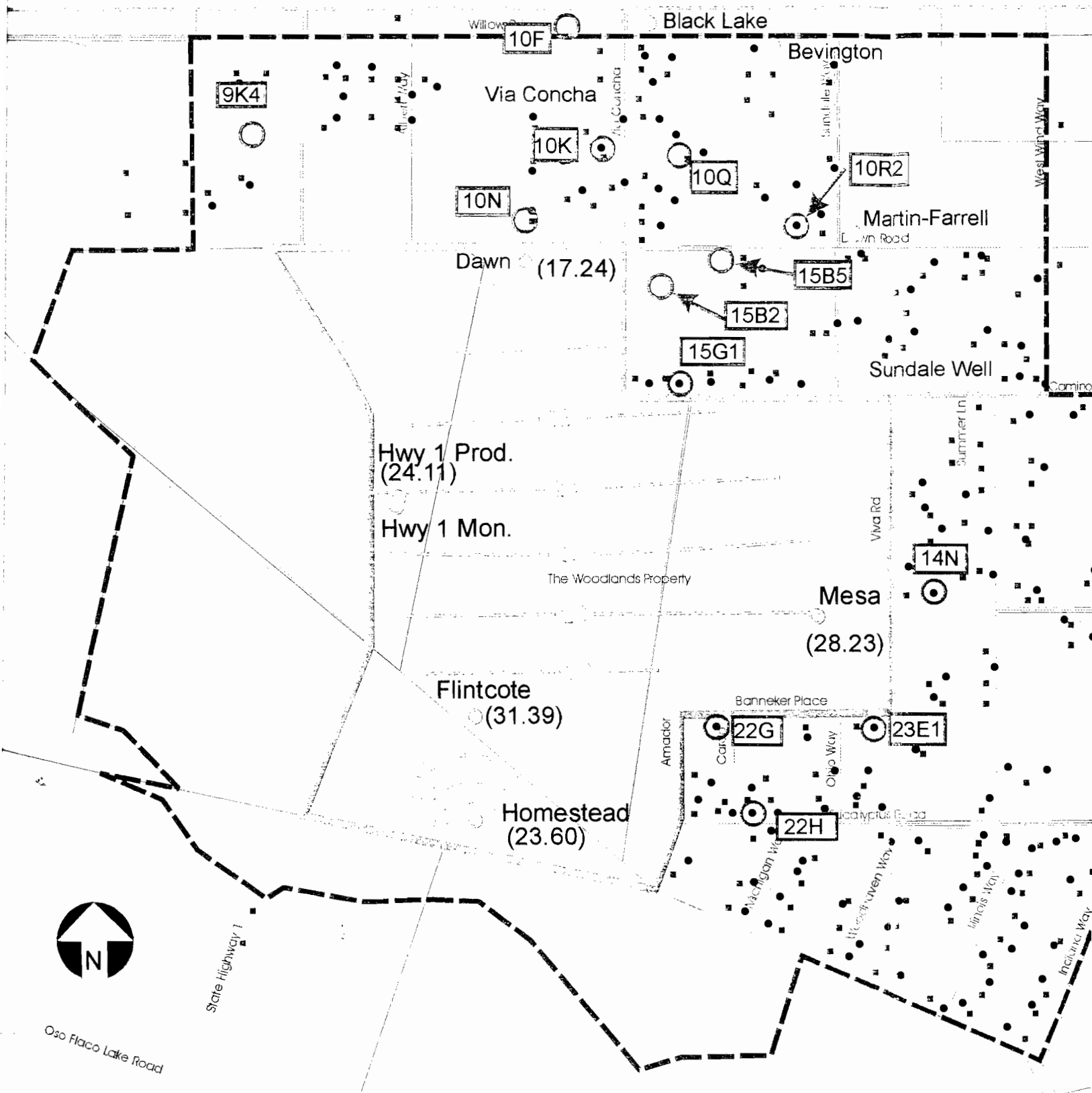
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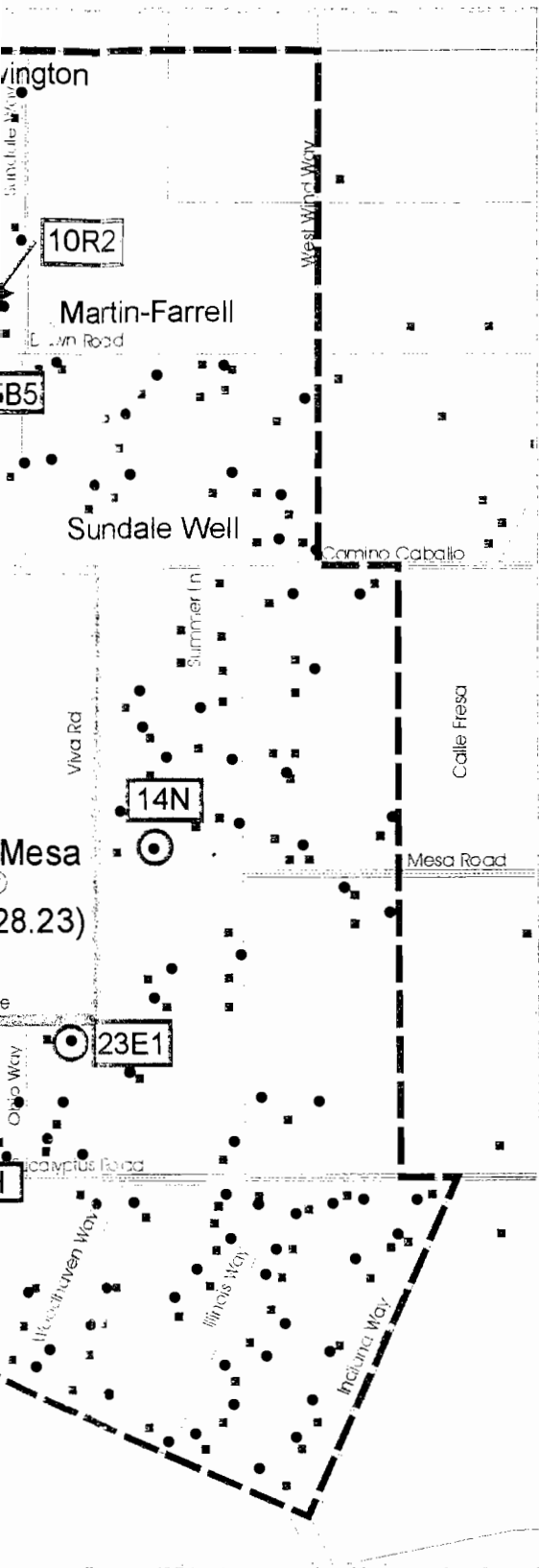
- Parcels = 115
- Houses = 151
- Domestic Wells = 132

Base Map: San Luis Obispo County  
 Building & Planning Dept.  
 Assessor's Parcel Maps



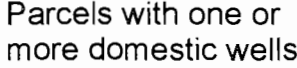








**Figure 1**  
**Onsite and Offsite Monitoring Well Location Map**  
**The Woodlands**  
 Cleath & Associates  
 September 2005

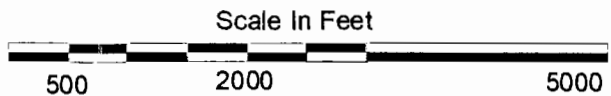




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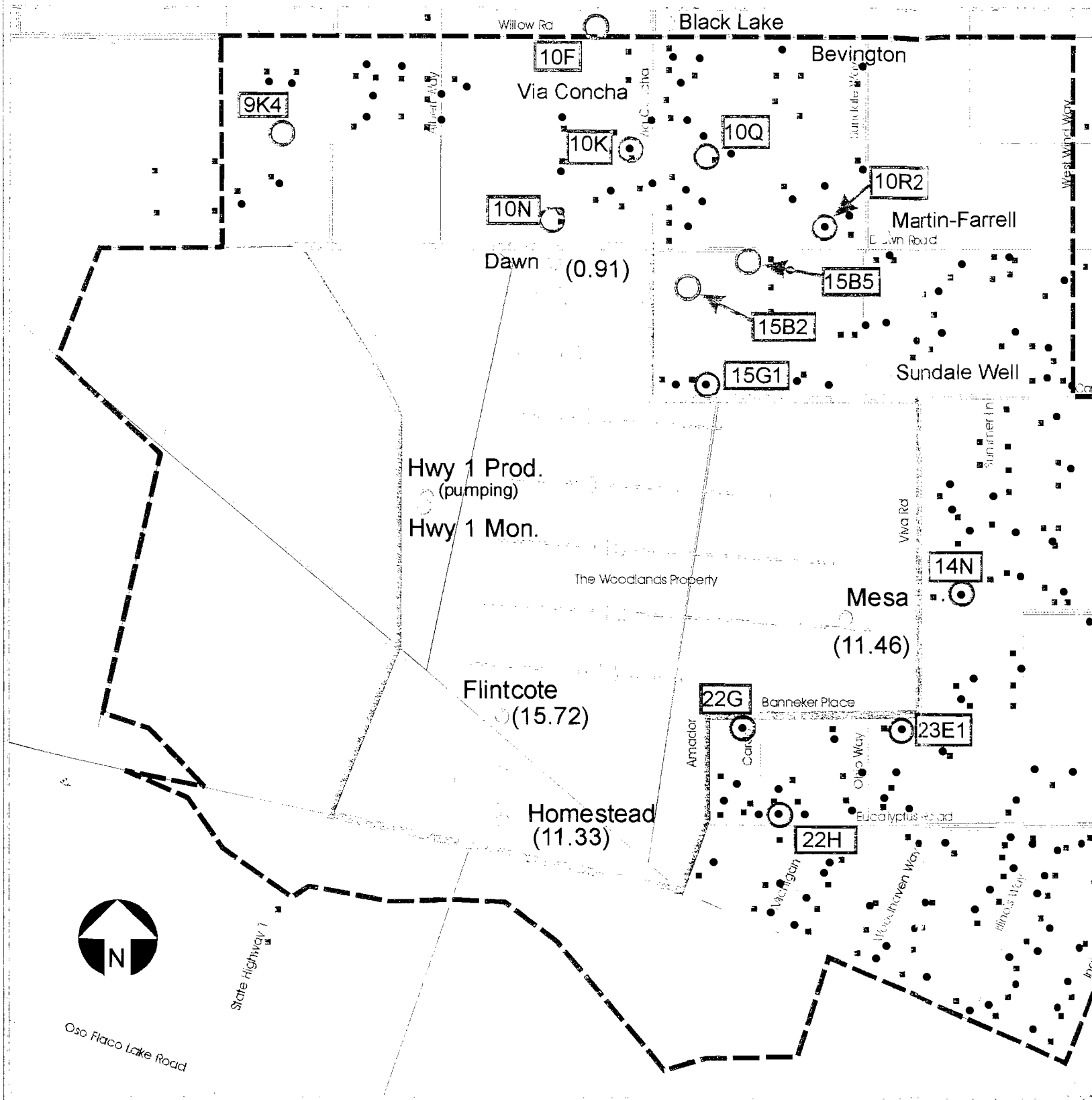
-  Impact Area Boundary
-  Site Boundary
-  Parcels with one or more domestic wells
-  Houses
-  Domestic Wells (Inferred)
-  Offsite Monitoring Well Location
-  Flintcote (31.39) Onsite Monitoring Well Location, ground water elevation in feet above sea level
-  Nipomo Community Services District Well
-  Onsite Ground water elevation contour on May 17, 2005, for confined aquifer zones, elevation in feet above sea level

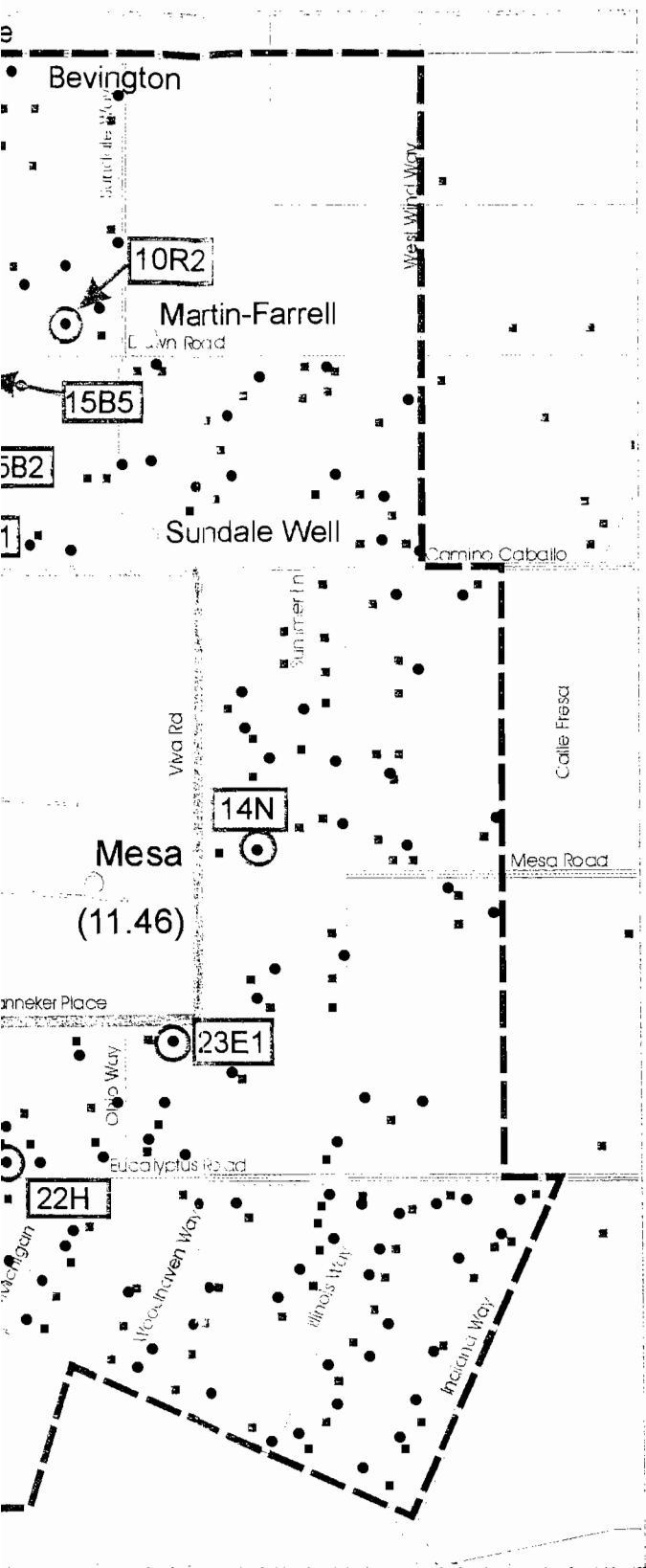
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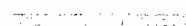




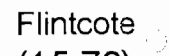
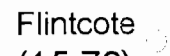
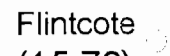
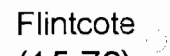
**Figure 4**  
**Onsite Ground Water Elevation Contours on May 17, 2005 for Confined Aquifer Zones**

**The Woodlands**  
 Cleath & Associates  
 September 2005

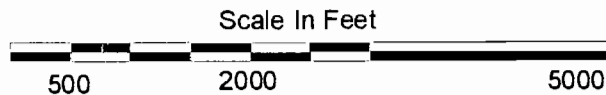




**EXPLANATION:**

-  Impact Area Boundary
-  Site Boundary
-  Parcels with one or more domestic wells
-  Houses
-  Domestic Wells (Inferred)
-  Offsite Monitoring Well Location
-  Onsite Monitoring Well Location, ground water elevation in feet above sea level
-  Flintcote (15.72)
-  Nipomo Community Services District Well
-  Onsite Ground water elevation contour on July 13, 2005, for confined aquifer zones, elevation in feet above sea level

Base Map: San Luis Obispo County  
 Building & Planning Dept.  
 Assessor's Parcel Maps



**Figure 5**  
**Onsite Ground Water Elevation Contours on July 13, 2005 for Confined Aquifer Zones**

**The Woodlands**  
 Cleath & Associates  
 September 2005