PROPOSED EXPANSION OF THE HIGH PLAINS AQUIFER OBSERVATION NETWORK FOR RELIABILITY ENHANCEMENT

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This report is an update of report OFR 97-84 prepared to improve the sampling reliability of the network by eliminating isolated maxima in the kriging standard deviation inside the major boundary of the aquifer. OFR 97-84 was prepared using the data from the 1997 annual survey. The kriging standard deviation is a measure of network reliability.

Data used here for the calculation of the kriging standard deviation come from the 1998 annual survey, which added some of the wells recommended in 1997 and do not include a few observation wells from 1997 eliminated from the network mainly for the deteriorated conditions of the wells.

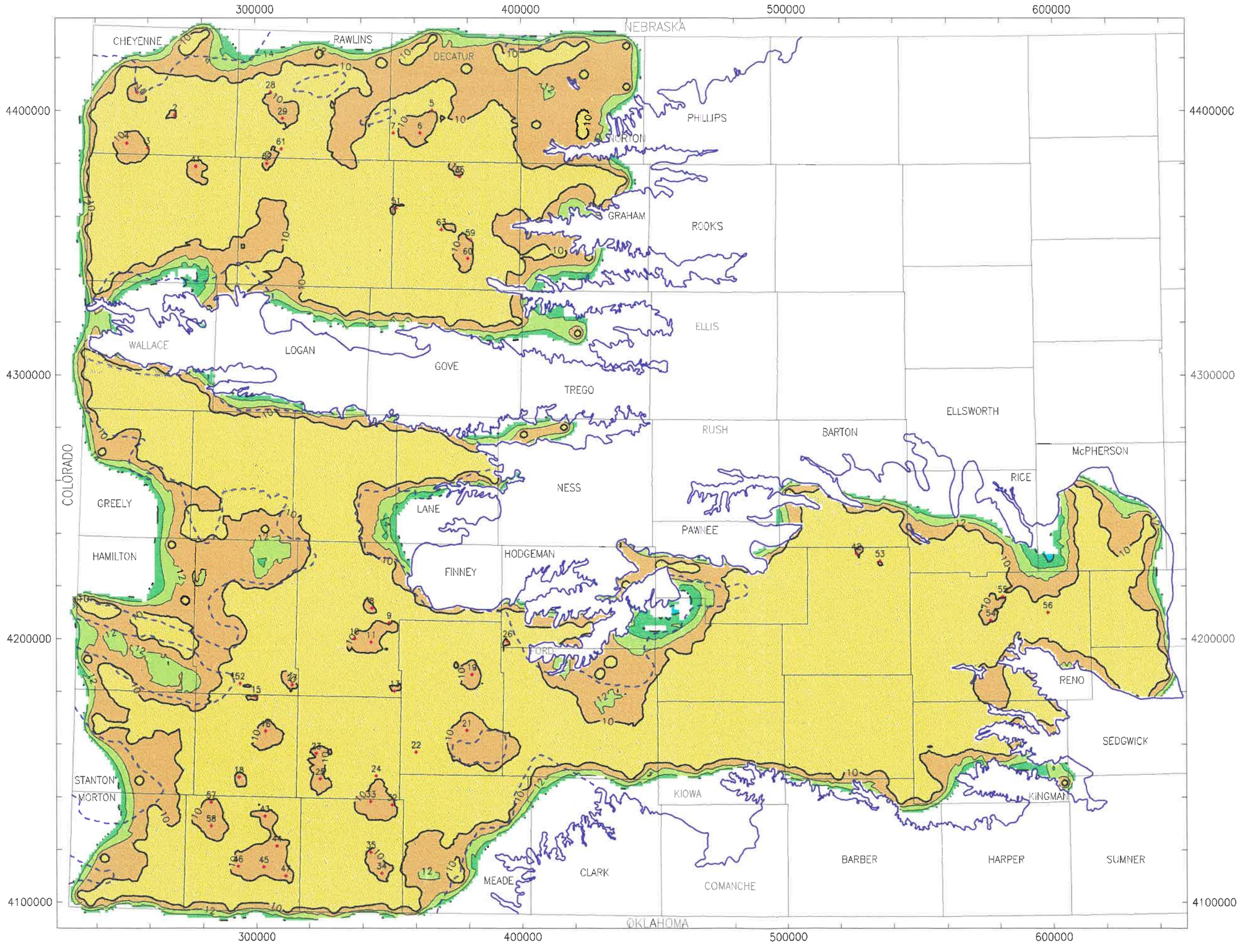
The table comprises a total of 50 locations, which, as illustrated by Plates 1 and 2, fulfill the requirement to eliminate maxima for the kriging standard deviation larger than 10 ft inside the major aquifer when a well is added at those locations. Ten centroids were eliminated from the OFR 97-84 list because of their proximity to wells with 1998 measurements, and 13 new locations were added to eliminate all maxima, including 4 wells in Stafford and Reno counties added to eliminate some maxima not intended to be eliminated with the 1997 proposal. When the identification number is less then 50, the centroid is the same one in OFR 97-84.

Placement of the wells is robust enough to tolerate arbitrary placement of one well inside the prescribed sections to preserve the property of eliminating all maxima.

Table. Proposed centroid for locations of new wells to keep kriging standard deviation below 10 ft inside the major aquifer, border effects discarded.

	Section			County
1	3S	40W	19	Cheyenne
2	4S	39W	15	
3	5S	40W	27	
4	5S	41W	23	
5	4S	29W	3	Decatur
6	4S	29W	32	
7	4S	30W	31	
8	23S	32W	24	Finney
9	24S	31W	3	
10	24S	32W	29	
11	24S	32W	36	
13	26S	31W	26	
15	27S	36W	4	Grant
16	28S	36W	14	
18	30S	37W	11	
19	26S	28W	2	Gray
21	28S	28W	10	
22	29S	30W	3	
23	29S	34W	11	Haskell
24	30S	31W	6	
25	30S	34W	12	
26	24S	26W	29	Hodgeman
27	26S	35W	23	Kearny
52	26S	37W	23	
28	3S	35W	17	Rawlins
29	4S	35W	14	
61	5S	35W	23	
54	23S	7W	31	Reno
55	22S	7W	34	
56	23S	5W	21	
32	31S	31W	10	Seward
33	31S	32W	2	
34	33S	31W	32	
35	33S	32W	2	
36	6S	28W	22	Sheridan
51	7S	30W	31	
59	9S	27W	6	
60	9S	28W	25	
63	8S	29w	24	
41	6S	38W	17	Sherman
42	21S	13W	12	Stafford
53	21S	12W	24	
43	31S	36W	27	Stevens
44	32S	35W	31	
45	33S	36W	27	
46	33S	37W	27	
47	34S	35W	4	
57	31S	38W	9	
58	32S	38W	9	
62	6S	35W	7	Thomas

1998 KRIGING STANDARD DEVIATION AND PROPOSED WELLS



Geologic boundary

Major aquifer limit

+ Well proposed by KGS

PLATE 1

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1998 KRIGING STANDARD DEVIATION AFTER ADDING PROPOSED WELLS

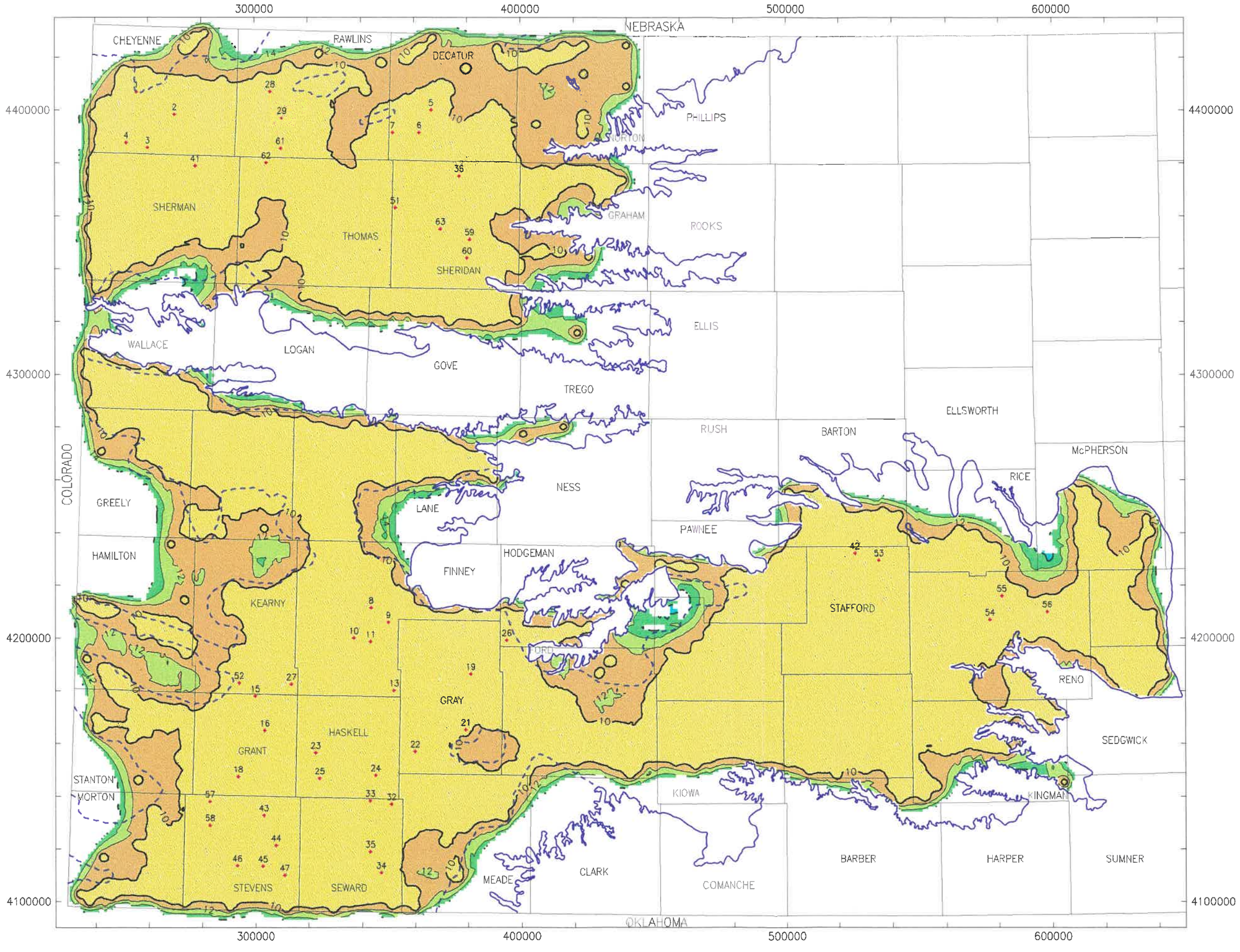

PLATE 2

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