

1 SUPERIOR COURT OF THE STATE OF CALIFORNIA

2 FOR THE COUNTY OF LOS ANGELES

3 DEPARTMENT NO. 1

HON. JACK KOMAR, JUDGE

4 COORDINATION PROCEEDING)

5 SPECIAL TITLE (RULE 1550B))

6 ANTELOPE VALLEY GROUNDWATER CASES))

JUDICIAL COUNCIL

COORDINATION

NO. JCCP4408

7 PALMDALE WATER DISTRICT AND)

8 QUARTZ HILL WATER DISTRICT,)

SANTA CLARA CASE NO.

1-05-CV-049053

9 CROSS-COMPLAINANTS,)

10 VS.)

11 LOS ANGELES COUNTY WATERWORKS,)

12 DISTRICT NO. 40, ET AL,)

13 CROSS-DEFENDANTS.)

14
15 REPORTER'S TRANSCRIPT OF PROCEEDINGS

16 WEDNESDAY, JANUARY 5, 2011

17
18 APPEARANCES:

19 (SEE APPEARANCE PAGES)

20
21
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23
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25
26
27 GINGER WELKER, CSR #5585
28 OFFICIAL REPORTER

1 Q ALL RIGHT. SO THAT'S YOUR CONCLUSION OUT OF
2 THIS EXHIBIT IS WHAT YOU JUST SAID?

3 A YES.

4 Q COULD YOU RESTATE THAT, PLEASE.

5 A WHEN WE COMPARE OUR CHANGE IN STORAGE WITH
6 THAT OF USGS OVER THE PERIOD OF TIME WE ARE LOOKING AT,
7 THERE CHANGE IN STORAGE THROUGH A COMPLETELY INDEPENDENT
8 ANALYSIS, NOT DEPENDING ON ANY OF THE INFORMATION WE USE
9 MATCHES OUR CHANGE OF STORAGE.

10 MR. ZIMMER: OBJECTION, YOUR HONOR, TO CONCLUSION
11 TO USGS TO THE EXTENT THAT IT IS BEING OFFERED AS PROOF
12 OF THE MATTER. HE CAN CERTAINLY RELY ON DATA FROM USGS;
13 BUT TO SAY THAT HIS CONCLUSION MATCHES USGS SUGGESTS
14 THAT SOMEHOW HE IS TRYING TO USE THE USGS CONCLUSION AS
15 AN OPINION IN ITSELF BEING PROFFERED --

16 THE REPORTER: MR. ZIMMER, YOUR LAST FEW WORDS
17 WERE FADING OFF.

18 THE COURT: DO YOU WANT TO RESPOND TO THAT?

19 MR. BUNN: YES. I DON'T KNOW WHY IT WOULD BE
20 IMPROPER. THE USGS REPORT IS A TYPE OF REPORT THAT
21 EXPERTS WOULD -- AND I CAN ELICIT THIS FROM THE WITNESS
22 IF YOU LIKE THAT IS RELIED UPON BY EXPERTS IN HIS
23 POSITION.

24 THE COURT: HE CAN TESTIFY THAT HE RELIED UPON
25 THAT REPORT FOR THEIR OPINIONS AND CONCLUSIONS FOR HIS
26 OWN OPINIONS AND CONCLUSIONS WITHOUT -- IT SEEMS TO ME
27 YOU DON'T OFFER THAT EVIDENCE OF USGS. THAT COMES IN BY
28 WAY OF CROSS-EXAMINATION, PERHAPS.

1 MR. BUNN: WELL, THAT IS CORRECT. I BELIEVE WHAT
2 HE JUST TESTIFIED TO WAS SIMPLY AS AN ADDITIONAL CHECK
3 ON HIS CONCLUSIONS THEY MATCH CONCLUSIONS THAT WERE
4 REACHED BY USGS.

5 THE COURT: THAT IS WHAT -- THAT IS WHAT THAT
6 CHART SHOWS.

7 MR. BUNN: YES.

8 THE COURT: SO WITHOUT ACCEPTING THE MATTER FOR
9 THE TRUTH OF MATTER ASSERTED BY THE USGS, HE CAN
10 CERTAINLY TESTIFY AS HE HAS.

11 MR. ZIMMER: THANK YOU, YOUR HONOR.

12 MR. BUNN: OKAY. I WOULD NOW LIKE TO SKIP UP TO
13 EXHIBIT 66.

14 Q AND THE REASON I'M SKIPPING UP,
15 MR. WILDERMUTH, IS THAT I WANT TO DO A RECAP OF WHAT YOU
16 HAVE DONE SO FAR AND WHAT YOU HAVE LEFT TO DO. YOU HAVE
17 ALREADY PRESENTED THIS EQUATION TO THE COURT; CORRECT?

18 A YES.

19 Q COULD YOU DO THAT -- EXPLAIN, AGAIN, IN
20 WORDS WHAT THIS EQUATION IS.

21 MR. WILLIAM KUHS: I OBJECT AS ASKED AND ANSWERED.

22 THE COURT: I'LL PERMIT HIM TO DO THAT. THAT IS
23 FINE.

24 THE WITNESS: THIS EQUATION IS THE EQUATION THAT
25 WE ARE USING TO CALCULATE NATURAL RECHARGE. AND IN
26 SIMPLE TERMS IT SAYS THAT THE NATURAL RECHARGE IS EQUAL
27 TO THE PUMPING PLUS THE SUBSURFACE OUTFLOW PLUS THE
28 CHANGE IN STORAGE MINUS ARTIFICIAL RECHARGE AND MINUS

1 RETURN FLOWS. OF COURSE, THIS CORRESPOND TO A PERIOD OF
2 TIME.

3 Q AND YOU HAVE ALREADY DISCUSSED THE PUMPING
4 AND THE SUBSURFACE OUTFLOW BRIEFLY YESTERDAY, AND THEN
5 WE HAD AN EXTENSIVE DISCUSSION OF CHANGE IN STORAGE;
6 CORRECT?

7 A YES.

8 Q SO NOW WE ARE LEFT WITH THE INFLOW TERMS;
9 CORRECT?

10 A YES.

11 Q ALL RIGHT. WOULD YOU EXPLAIN, THEN, WHAT
12 THOSE INFLOW TERMS ARE AND HOW YOU ESTIMATED THEM.

13 A WELL THE INFLOW TERMS CONSISTS OF IRRIGATION
14 RETURNS FROM BOTH URBAN AND AGRICULTURAL PRACTICES,
15 RECYCLED RECHARGE, SEPTIC TANK RECHARGE, AND ARTIFICIAL
16 RECHARGE OF IMPORTED WATER.

17 Q OKAY. LET'S START WITH IRRIGATION RETURN
18 FLOWS. WHAT ARE THOSE?

19 A WELL, WHEN CROPS ARE IRRIGATED OR URBAN
20 LANDSCAPE ARE IRRIGATED MORE WATER IS APPLIED TO THE
21 LAND SURFACE THAN REQUIRED FOR THE CONSUMPTIVE USE OF
22 THAT VEGETATIVE MATERIAL. THAT DIFFERENCE (COUGHING)
23 EXCUSE ME -- RECHARGES THE GROUNDWATER WATER BASIN, CAN
24 MAKE IT PAST THE ROOT ZONE AND FIND A WAY DOWN. THAT IS
25 WHAT THE IRRIGATION RETURN FLOWS ARE.

26 Q ALL RIGHT. LET'S LOOK AT EXHIBIT 62. WHAT
27 WAS THE SOURCE OF THIS EXHIBIT?

28 A THE SOURCE OF THE INFORMATION IN THIS

1 EXHIBIT IS FROM JOE SCALMANINI AND HIS WORK IN THE
2 SUMMARY EXPERT REPORT.

3 Q DID HE PREPARE THE CHART?

4 A I PREPARED THE CHART.

5 Q BASED ON HIS DATA?

6 A YES.

7 Q WHAT DOES THIS SHOW?

8 A THIS SHOWS --

9 MR. JOYCE: OBJECTION, YOUR HONOR. MAY I VOIR
10 DIRE ON THIS EXHIBIT.

11 THE COURT: CONCERNING WHAT?

12 MR. JOYCE: YOUR HONOR, THIS APPARENTLY NOTHING
13 MORE THAN A GRAPHIC ILLUSTRATION OF THE WORK DONE BY
14 ANOTHER PERSON. CONSEQUENTLY, ANY TESTIMONY HE WOULD
15 OFFER ABOUT IT WOULD AT BEST BE HEARSAY.

16 THE COURT: I'M GOING TO OVERRULE THE OBJECTION.
17 HE MAY TESTIFY TO HIS OPINION. HE CREATED THIS. THIS
18 IS HIS OPINION, AS I UNDERSTAND IT; AND YOU WILL BE ABLE
19 TO CROSS-EXAMINE. GO AHEAD.

20 BY MR. BUNN:

21 Q THANK YOU. WHAT DOES THAT CHART SHOWS?

22 A THIS CHART IS BAR CHART. AND, AGAIN, THE
23 TIME IS ALONG THE BOTTOM. AND THE "Y" AXIS HERE IS
24 ARRANGED IN IRRIGATION RETURN FLOWS THAT WERE ESTIMATED
25 TO HAVE OCCURRED, AND THIS IS FOR A TIME PERIOD SAY '49
26 THROUGH 2005.

27 THIS -- IT ILLUSTRATES THE VARIABILITY OF
28 THE IRRIGATION RETURN FLOWS IN THE 100,000 RANGE THROUGH

1 THE MID-60'S, AND THEN IT BEGAN TO DROP SUBSTANTIALLY
2 THROUGH THE LATE 80'S OR 90'S AND THEN BEGAN TO RAMP UP,
3 AGAIN, THROUGH 2003 OR '04.

4 Q EXHIBIT 63, WAS THIS PREPARED BY YOU OR AT
5 YOUR DIRECTION?

6 A YES.

7 Q WHAT DOES IT SHOW?

8 A WELL, THIS IS MEANT TO SHOW A CROSS-SECTION
9 OF THE EARTH STARTING AT THE GROUND SURFACE DOWN TO THE
10 SATURATED ZONE. IT DEFINES THE SPACE BETWEEN GROUND
11 SURFACE OR THE BOTTOM OF THE ROOT ZONE TO THE WATER
12 TABLE AS THE VADOSE ZONE, DEFINES AN ENTITY CALLED THE
13 VADOSE.

14 THE REPORTER: PLEASE SPELL THAT FOR ME, SIR.

15 THE WITNESS: V-A-D-O-S-E.

16 THE REPORTER: THANK YOU.

17 THE WITNESS: THAT EXTENDS FROM THE GROUND SURFACE
18 OR THE BOTTOM OF THE ROOT ZONE TO THE SATURATED ZONE.
19 BY MR. BUNN:

20 Q WHAT IS THE SATURATE ZONE?

21 A THE SATURATE ZONE THE AREA IN THE AQUIFER
22 SYSTEM THAT IS FULLY SATURATED. IT IS BOUNDED BY WHAT
23 WE CALL THE WATER TABLE. IT IS BOUNDED BY THE WATER
24 TABLE SO THAT THE VADOSE ZONE BETWEEN GROUND SURFACE AND
25 WATER TABLE IS VERY SATURATED WHICH MEANS THAT IT IS NOT
26 100 PERCENT SATURATED. IT MAY BE IN PLACES, AND OTHER
27 PLACES THERE IS ATMOSPHERIC GASES IN THE VOIDS. SO IT
28 IS NOT COMPLETELY FULL OF WATER.

1 Q IF YOU WERE TO DRILL A HYPOTHETICAL WELL AND
2 MEASURE THE GROUNDWATER LEVELING THAT WELL, WHERE WOULD
3 IT SHOW UP ON THIS DIAGRAM?

4 A IN THE VADOSE ZONE.

5 Q OKAY.

6 A I'M SORRY. I DIDN'T UNDERSTAND THE
7 QUESTION.

8 Q IF YOU WERE TO DRILL THE WELL, A DEEP WELL,
9 THAT GOES DOWN INTO SATURATED ZONE AND MEASURE
10 GROUNDWATER ELEVATION IN THAT WELL, WHERE WOULD THAT
11 GROUNDWATER ELEVATION BE IN REFERENCE TO THIS DIAGRAM?

12 A AT THE INTERFACE OF THE BLUE AND THE
13 GREENISH AREA.

14 MR. ZIMMER: YOUR HONOR, THIS IS MR. ZIMMER. I
15 HAVE AN OBJECTION. THIS IS BEYOND THE SCOPE POTENTIALLY
16 ACCUMULATIVE. I KNOW WE NEED TO HEAR THIS INFORMATION;
17 AND IN THE SUMMARY EXPERT REPORT AND WHAT WE WERE TOLD
18 IN THE DEPOSITIONS THAT THIS WAS AN AREA COVERED BY
19 MR. SCALMANINI. SO I DON'T WANT HAVE TO SIT UP IN
20 WALNUT CREEK THREE HOURS A DAY ONLY WITH MR. SCALMANINI
21 AND HAVE HIM REPEAT ALL THE SAME INFORMATION THAT WE ARE
22 HEARING TODAY.

23 SO JUST RAISING THAT ISSUE BECAUSE I ASSUME
24 IF HE STARTS TESTIFYING TO IT, AGAIN, WE MAY HAVE A
25 PROBLEM IN WALNUT CREEK.

26 THE COURT: I'M NOT SURE I UNDERSTAND THE NATURE
27 OF YOUR OBJECTION.

28 MR. ZIMMER: THE NATURE OF THE OBJECTION IS THAT

1 THIS WAS AN AREA DESIGNATED BY MR. SCALMANINI AS BEING
2 HIS AREA OF EXPERTISE, AND MR. SCALMANINI DEPOSITION
3 AND -- AND THAT HE WOULD BE GIVING TESTIMONY AS TO THIS
4 INFORMATION IN TERMS OF AGRICULTURAL RETURN FLOWS.

5 THE COURT: SO YOU THINK THERE WOULD BE A
6 DUPLICATION?

7 MR. ZIMMER: THAT IS THE ACCUMULATIVE ASPECT TO
8 IT, YES.

9 THE COURT: LET'S HOPE THAT THOSE QUESTIONS ARE
10 NOT ASKED AGAIN OF ANOTHER WITNESS.

11 MR. ZIMMER: THANK YOU, YOUR HONOR.

12 THE COURT: TO THE EXTENT THAT EVERYBODY AGREES
13 THAT THESE ARE CORRECT OPINIONS. I DON'T KNOW TO WHAT
14 EXTENT THEY ARE GOING TO BE DISPUTED SO -- AT THIS POINT
15 OVERRULED. AND YOU MAY ANSWER -- NEXT QUESTION.

16 MR. BUNN: THANK YOU.

17 Q YOU HAVE DESCRIBED THE VADOSE ZONE AND THE
18 SATURATED ZONE. WILL YOU TELL US WHAT THE REST OF THE
19 EXHIBIT SHOWS?

20 A WELL, WHEN WATER IS APPLIED ON THE SURFACE,
21 IT MAKES IT TO THE ROOT ZONE. IT HAS TO TRAVEL ALL THE
22 WAY DOWN THE SATURATED ZONE AND BECOME PART OF THE
23 USEFUL GROUNDWATER SYSTEM THAT WHICH WE CAN PUMP WATER
24 FROM. THAT TAKES TIME TO DO IT. IT TAKES TIME TO
25 TRANSIT THAT VADOSE ZONE. SO WHAT WE DID WAS WE MADE AN
26 ESTIMATE OF THE TRAVEL TIME FOR THAT WATER TO MAKE IT
27 DOWN FROM THE GROUND SURFACE.

28 MR. WILLIAM KUHS: I AM GOING TO OBJECT AT THIS

1 POINT AS NONRESPONSIVE. THE QUESTION WAS WHAT DOES THIS
2 EXHIBIT SHOW, NOT WHAT HE SUBSEQUENTLY DID.

3 THE COURT: WELL, I THINK HE IS EXPLAINED WHAT THE
4 EXHIBIT SHOWS. IF HE IS NOT, YOU CAN MAKE A MOTION TO
5 STRIKE.

6 BY MR. BUNN:

7 Q GO ON, PLEASE.

8 A WE UNDERSTAND FROM OUR EXPERIENCE IN DOING
9 THESE KIND OF COMPUTATIONS THAT THERE'S A TRANSIT TIME
10 FROM THE ROOT ZONE OR THE GROUND SURFACE TO THE
11 SATURATED ZONE. THAT IS NOT AN INSTANTANEOUS PROCESS.

12 AND WHAT THIS CHART SHOWS -- IT IS SORT OF
13 SCHEMATIC OF WHAT THAT TORTUROUS PATH MIGHT LOOK LIKE.
14 THE VADOSE ZONE AND THE SATURATED ZONE ARE INTERBEDDED
15 WITH FINE GRAIN AND COARSE GRAIN UNITS.

16 SO THE PATH IS NOT STRAIGHT DOWN. THE PATH
17 IS DOWN MILE PURCHASING ON FINE GRAIN UNITS, TRIES TO
18 FIND A WAY DOWN. IF IT PERCHES SIGNIFICANTLY ON FINE
19 GRAIN UNITS, IT MAY BE ABLE TO PUMP -- TO PASS THROUGH
20 THAT UNIT.

21 BUT, PRIMARILY, THE WATER IS LOOKING FOR THE
22 PATH OF LEAST RESISTANCE. SO YOU END UP WITH THIS VERY
23 SATURATED, VERY COMPLICATED VADOSE ZONE. SO TO FIGURE
24 OUT TRAVEL TIME FROM HERE REQUIRES A GREAT DEAL OF WORK.

25 AND IN OUR ANALYSIS, WE USED ONE DIMENSIONAL
26 MODEL OR NEAR ONE DIMENSIONAL MODEL, AND WE USED
27 EXPERIENCE IN OTHER GROUNDWATER BASINS TO COME UP WITH A
28 RANGE OF TIME AND TRANSIT WHICH WE WILL TERM "LAG TIME."

1 Q WELL, OKAY. AND WHAT IS -- WHAT IS THE
2 DEFINITION OF LAG TIME?

3 A LAG TIME, YOU KNOW, AT A SPECIFIC LOCATION
4 WOULD BE TIME IT TAKES FOR WATER TO TRANSIT THE VADOSE
5 ZONE. SO IF YOU PUT A VOLUME OF WATER INTO THE GROUND,
6 HOW LONG WOULD IT TAKE FOR IT TO TRANSIT THE VADOSE ZONE
7 IN ARRIVING IN THE SATURATED ZONE.

8 Q BEFORE WE GO ON WITH YOUR METHOD OF
9 ESTIMATING LAG TIME, TELL US WHY THAT IS IMPORTANT.

10 A WELL, IT IS IMPORTANT IN -- IT IS IMPORTANT
11 FOR -- AT A VERY BASIC LEVEL, IT'S IMPORTANT IN THE
12 INTERPRETATION OF WATER LEVEL HYDROGRAPHS. BECAUSE IF
13 YOU -- IF YOU KNOW THAT THERE IS A GREAT DEAL OF WATER
14 IN STORAGE IN THE VADOSE ZONE TRYING TO TRANSIT DOWN,
15 YOU CAN HAVE -- YOU COULD ASSUME, FOR EXAMPLE, THAT THE
16 WATER LEVELS -- THEY STILL COULD BE DROPPING WHILE THERE
17 IS WATER IN STORAGE IN THE VADOSE ZONE.

18 YOU COULD HAVE A DRY PERIOD. THIS WATER
19 COULD ARRIVE IN THE SATURATED ZONE AND COULD RAISE WATER
20 LEVELS. AND, BASICALLY, YOU WOULDN'T BE ABLE TO
21 INTERPRET THOSE WATER LEVEL HYDROGRAPHS.

22 IN THE PARTICULAR CASE WE ARE LOOKING AT
23 HERE, IT IS IMPORTANT BECAUSE THERE IS WATER STORED IN
24 THE VADOSE ZONE PRIOR TO 1951 THAT IS RECHARGING THE
25 SATURATED ZONE AFTER '51. AND WE HAVE TO KNOW WHAT THAT
26 IS SO WE CAN ACCURATELY CALCULATE NATURAL RECHARGE.

27 SO, BASICALLY, THERE IS ANOTHER RECHARGE
28 SOURCE COMING IN INTO THE BASIN THAT IS OCCURRING FROM A

1 RECHARGE EVENT THAT OCCURRED PRIOR TO '51.

2 Q WELL, SO AT A VERY BASIC LEVEL, YOU ARE
3 CALCULATING THE NATURAL RECHARGE, AND YOU ARE EXPLAINING
4 TO US THE INFLOW TERMS. AND ONE OF THE INFLOW TERMS IS
5 IRRIGATION RETURN FLOW.

6 HOW DID THE CONCEPT EXPRESSED ON THIS
7 DIAGRAM AFFECT THAT TERM, THE IRRIGATION RETURN FLOW?

8 A COULD YOU REASK THE QUESTION.

9 Q YES. WHAT I'M TRYING TO HAVE US ALL
10 UNDERSTAND IS THE REALLOCATION OF THIS DIAGRAM TO THE
11 CALCULATION THAT YOU ARE ABOUT TO EXPLAIN OF THE NATURAL
12 RECHARGE; AND, SPECIFICALLY, HOW THIS DIAGRAM RELATES TO
13 THE TERM IN YOUR EQUATION FROM IRRIGATION RETURN FLOWS.
14 SO IF YOU -- COULD YOU EXPLAIN THAT?

15 A YES. WHAT THIS CHART SHOWS IS THAT WATER
16 DOESN'T FLOW STRAIGHT DOWN. WATER FLOWS -- IT HITS
17 THESE IMPERMEABLE LAYERS. IT BUILDS UP STORAGE, MOVES
18 Laterally, AND TRIES TO FIND A WAY DOWN TO BREAKS IN
19 THESE -- THE AREAS WHERE THESE FINE GRAIN UNITS DON'T
20 EXIST.

21 SO YOU CAN BUILD UP A GREAT DEAL OF WATER IN
22 STORAGE, AND YOU CAN ALSO SLOW THAT WATER DOWN QUITE A
23 BIT. THE REASON THAT IS IMPORTANT IS THE TIME HISTORY
24 OF IRRIGATION RETURNS HAS A DISTINCT SHAPE TO IT. IT
25 STARTS OUT LOW, GETS HIGH, AND DROPS AGAIN. AND WE
26 HAVE -- RECHARGE OCCURRING FROM IRRIGATION RETURNS PRIOR
27 TO 1951 WHICH ACTUALLY BECOME RECHARGE WATER TABLE AFTER
28 '51 IN THIS ANALYSIS.

1 SO WE HAVE TO GET A REASONABLE ESTIMATE OF
2 WHAT THAT LAG TIME IS SO THAT WE ACCOUNT FOR THAT IN
3 THAT RECHARGE TERM.

4 Q ACCOUNT FOR THE --

5 A RETURN FLOWS THAT OCCURRED PRIOR TO '51, AND
6 FOR THAT MATTER NOT TO INCLUDE SOME OF THE RETURN FLOWS
7 THAT OCCURRED LATE IN THE PERIOD THAT WOULD NEVER MAKE
8 IT TO THE WATER TABLE; YOU KNOW, IN A PERIOD OF TIME
9 APPROACHING 2005. SOME OF THAT WATER DOES NOT MAKE IT
10 INTO THE EQUATION. BASICALLY, IF YOU WERE TO DRAW A
11 LINE AND SAY -- MAYBE GO BACK TO THAT BAR CHART. WHAT
12 I'M SUGGESTING TO YOU IS --

13 Q THIS IS EXHIBIT 62?

14 A YEAH, NOT A GREAT EXHIBIT TO LOOK AT HERE;
15 BUT IF THE RECHARGE HISTORY FOR IRRIGATION RETURN
16 GOES -- SLOPES DOWN LIKE THIS OFF THIS CHART. WHAT I'M
17 SAYING RECHARGE OCCURRING BEFORE '51 OUT HERE THAT IF
18 YOU OMIT THE LAG TIME, IT BRINGS THAT INTO THE
19 CALCULATION. LIKEWISE, THE RETURN FLOW IS OUT HERE ARE
20 NOT USED IN THE CALCULATION.

21 THEY ARE BASICALLY SHIFTING THAT -- SHIFTING
22 THE WINDOW OF RECHARGE BACK IN TIME. SO WE DON'T USE IT
23 EXPLICITLY 1951 AND 1951 -- 1951 THAT RECHARGE EVENT
24 SHOWS UP LATER IN THE ANALYSIS DEPENDING ON THE LAG
25 TIME. IT COULD BE TEN OR 15 OR 20 YEARS LATER.

26 Q ALL RIGHT. BACK TO EXHIBIT 63. HOW DID YOU
27 GO ABOUT ESTIMATING THE LAG TIME THAT YOU USED?

28 A WE STARTED WITH ASSUMING A RANGE OF LAG

1 TIMES BASED ON OUR EXPERIENCE IN OTHER GROUNDWATER
2 BASINS. WE ALSO APPLIED A ONE DIMENSIONAL FLOW MODEL
3 CALLED HYDROS ON A SIMPLE COLUMN, AND THIS CUT AWAY HERE
4 ON THE RIGHT SHOWS WHAT THAT COLUMN WOULD LOOK LIKE.

5 Q YOU ARE REFERRING TO THE COLUMN ON EXHIBIT
6 63 AT THE RIGHT-HAND SIDE OF THE DIAGRAM THAT SAYS 1D
7 MODEL?

8 A THAT IS CORRECT. WE HAVE USED THIS MODEL
9 BEFORE AND HAVE FOUND IN THOSE APPLICATIONS THAT IT --
10 IF YOU ARE SIMULATING FLOW THAT IT OVER ESTIMATES OR
11 IT -- IT GIVES YOU THE LAG TIME WHICH IS MUCH SLOWER
12 THAN WE GET WHEN YOU -- IF YOU BUILT AND CALIBRATED THE
13 GROUNDWATER MODEL.

14 IN FACT, WE USE IT FOR THAT PURPOSE, AND WE
15 USE IT TO GENERALIZE FLAG TIMES ACROSS THE BASIN, BUT WE
16 DON'T USE ITS VALUES. FOR EXAMPLE, IN OUR ANALYSIS IF
17 IT TOLD US LAG TIMES RANGED BETWEEN, SAY, TWO AND TEN
18 YEARS AT VARIOUS PLACES, YOU WOULD ADJUST THOSE TOGETHER
19 TO GET A LAG TIME THAT WOULD WORK IN THE GROUNDWATER
20 SIMULATION MODELS.

21 THE REASON THERE IS A DISPARITY THERE THAT
22 THESE 1D MODELS WHEN YOU LOAD THEM AT THE TOP, THE WATER
23 CAN ONLY GO STRAIGHT DOWN, AND YOU GET MOISTURE
24 DISTRIBUTIONS IN THAT MODEL AND THAT COLUMN WHICH ARE
25 CONDUCIVE TO FASTER MOVEMENT. WHEN IN REALITY WATER IS
26 HITTING THESE LENTICULAR UNITS AND MOVING OUT SIDEWAYS
27 AND GOING INTO STORAGE, AND THAT IS THE DIFFERENCE.

28 Q AND THE WORD YOU USED WAS "LENTICULAR"?

1 A LENTICULAR REFERS TO THE LENS-LIKE
2 INTERBEDDINGS OF THE VADOSE ZONE ITSELF AND THE
3 SATURATED ZONE. IT IS MADE UP OF INTERBEDDED LAYERS OF
4 SAND, GRAVEL, SILT AND CLAYS.

5 THE REPORTER: MAY I HAVE A SPELLING.

6 THE WITNESS: L-E-N-T-I-C-U-L-A-R.

7 BY MR. BUNN:

8 Q SO CAN LAG TIMES BE RELIABLY ESTIMATED FROM
9 A ONE-DIMENSIONAL MODEL?

10 A NO.

11 Q AND DID YOU ALREADY EXPLAIN WHY THAT WAS AND
12 IS THERE ADDITIONAL --

13 A I BELIEVE I EXPLAINED IT.

14 Q OKAY.

15 SO HOW DID YOU COME UP WITH YOUR ESTIMATE OF
16 LAG TIME?

17 A WELL, LAG TIME IS A FUNCTION OF LOADING RATE
18 AND VADOSE ZONE THICKNESS AND THEN THE ACTUAL PROPERTIES
19 OF THE SEDIMENTS THEMSELVES. THERE'S A GREAT DEAL OF
20 VARIABILITY IN THE VADOSE ZONE THICKNESS. YOU WOULD
21 EXPECT LAG TIMES TO VARY BASED ON VADOSE THICKNESS AND
22 APPLICATION RATES. THE LOADING RATES WE WERE USING WERE
23 BETWEEN, SAY, ONE AND TWO FEET PER YEAR WHERE THE LOWER
24 RATE BEING ATTRIBUTED TO, SAY, IRRIGATION IN URBAN AREAS
25 AND, PERHAPS, KINDS OF CROPS THAT ARE GROWING -- IN THE
26 LATTER YEARS OF THE INVESTIGATION PERIOD OF THE BASE
27 PERIOD. AND THE HIGHER RATE CORRESPONDING TO ALFALFA SO
28 THAT VARIES.

1 IN OUR EXPERIENCE IN OTHER GROUNDWATER
2 BASINS WHERE WE DO VERY DETAILED ANALYSIS, WE ACTUALLY
3 HAVE VARYING LAG TIMES OVER THE WATERSHED OVER THE
4 BASIN. IN THIS CASE WE DON'T HAVE THE ABILITY TO DO
5 THAT.

6 SO WE LOOKED AT IT PARAMETRICALLY AND SAID
7 AVERAGE LAG WAS 10 YEARS, 15, OR 20 YEARS, AND WE
8 CALCULATED IT DOWN TO RECHARGE ESTIMATES BASED ON THOSE
9 THREE LAG TIMES ASSUMPTIONS.

10 Q SO YOU MADE -- YOU CALCULATED -- YOU
11 CALCULATED NATURAL RECHARGE BASED ON THREE DIFFERENT LAG
12 TIME ASSUMPTIONS. AND WHAT DID YOU BASE THOSE
13 ASSUMPTIONS ON?

14 A THEY WERE BASED ON OUR EXPERIENCE AND THERE
15 WAS -- THERE WAS ALSO -- IN CHINO BASIN AND BEAUMONT
16 BASIN, MODELING WORK WE HAVE DONE IN LAST THREE YEARS --
17 OR FOUR YEARS. AND WE ALSO IN DOING OUR RESEARCH IN
18 ANTELOPE VALLEY NOTED THAT IN THE LEIGHTON AND PHILLIPS
19 MODEL THEY USED THE LAG TIME OF 10 YEARS UNIFORMILY
20 ACROSS THE ANTELOPE VALLEY IN THEIR MODEL FOR THE THEIR
21 IRRIGATION RETURNS.

22 Q LET'S GO TO EXHIBIT 64.

23 MR. ZIMMER: OBJECTION TO THE LEIGHTON PHILLIPS
24 LAG TIME TO THE EXTENT THAT IT IS OFFERED FOR ANY
25 PURPOSE OTHER THAN POTENTIAL FOUNDATION FOR THIS WITNESS
26 TESTIFYING.

27 MR. BUNN: THAT'S ALL IT IS OFFERED FOR.

28 THE COURT: SEEMS TO ME THAT IS WHAT IT IS OFFERED

1 FOR. I DON'T KNOW WHAT OTHER VALUE IT COULD HAVE.

2 BY MR. BUNN:

3 Q EXHIBIT 64, WAS THIS EXHIBIT PREPARED BY YOU
4 OR AT YOUR DIRECTION?

5 A YES.

6 Q WHAT DOES IT SHOW?

7 A THIS IS A VERY COMPLICATED CHART. I'LL TRY
8 TO BREAK IT DOWN IN PIECES. ON THE BOTTOM OF THE
9 AXIS -- THE "X" AXIS, AGAIN, IS TIME, AND IT IS SHOWING
10 EACH OF THOSE YEARS CORRESPOND TO A LAND-USE MAP THAT
11 WAS PREPARED BY THE DEPARTMENT OF WATER RESOURCES AND
12 DIGITIZED BY SCALMANINI.

13 THE INTENT OF THIS CHART IS TO SHOW HOW LONG
14 OR DESCRIBE HOW LONG LANDS ARE LEFT IN CULTIVATION. SO
15 IF WE LOOK AT 1947, YOU SEE ONE PURPLE OR DARK BLUE BAR.
16 IT GOES UP TO 100 PERCENT. WHAT THAT MEANS IS THAT THE
17 LAND USE THAT IS MAPPED AS IRRIGATED AGRICULTURAL IN
18 1947 BY DWR IS 100 PERCENT.

19 WHAT THAT MEANS IS THERE WAS IRRIGATED LAND
20 USE IN THAT TIME, AND WE'RE SHOWING ALL OF IT WAS
21 INVESTIGATED AT THAT TIME.

22 IF YOU LOOK AT 1950, YOU SEE THAT NUMBER
23 DROPS TO THE MID-60'S. WHAT THAT MEANS IS FOR THE SAME
24 COLORED BAR THAT IS -- ABOUT 65 PERCENT OF THE LAND THAT
25 WAS IRRIGATED IN '47 WAS IRRIGATED IN 1950. SO
26 33 PERCENT OF THE LAND THAT WAS IRRIGATED IN '47 IS NO
27 LONGER BEING IRRIGATED.

28 IF YOU FOLLOW OVER TO '57 WHICH IS TEN YEARS

1 FROM THERE, IT SAYS THAT LAND THAT WAS IRRIGATED IN '47
2 HAS NOW DROPPED BELOW 50 PERCENT AND IS AROUND
3 45 PERCENT. IF YOU GO TO EACH OF THESE YEARS, THAT DARK
4 BLUE BAR SHOWS THE AMOUNT OF LAND THAT WAS IRRIGATED IN
5 '47 THAT IS STILL IN -- STILL BEING IRRIGATED. SO WE
6 ARE GOING TEN YEARS. AND HALF THE LAND THAT WAS
7 IRRIGATED IN '47 IS NOT IRRIGATED IN '57.

8 IF YOU LOOK AT 1950 AND YOU LOOK AT THAT
9 DARK RED BAR THAT CORRESPONDS TO THE IRRIGATED LANDS
10 THAT WERE IRRIGATED IN 1950. IF WE ARE LOOKING AT ALL
11 LAND IN 1950 THAT WAS IRRIGATED, IT WOULD BE
12 100 PERCENT. IF YOU GO SEVEN YEARS LATER IN 57, IT IS
13 DOWN TO ALMOST 50 PERCENT, AND IT KEEPS DROPPING ALL THE
14 TIME AND SO ON.

15 THE PURPOSE OF THIS IS TO SHOW THAT THE
16 LANDS ARE BEING IRRIGATED ARE NOT BEING IRRIGATED FOR
17 MORE THAN ABOUT TEN YEARS OR SO. MAYBE SOME LANDS WOULD
18 CONTINUED TO BE IRRIGATED, BUT MOST OF THE LAND THAT IS
19 IRRIGATED IN A GIVEN YEAR IS NOT IRRIGATED TEN YEARS
20 LATER.

21 Q BEFORE WE GO ON ONE OF THE -- IN THE LEGEND
22 ON THE RIGHT, ONE OF THE YEARS IS 1896?

23 A 1986.

24 Q IT SHOULD BE 1986?

25 A YES.

26 Q WHAT CONCLUSIONS CAN YOU DRAW FROM THIS
27 FACT?

28 A WELL, ONE OF THE CONCERNS IN LOOKING AT

1 LONGER LAG TIMES IS THAT WE WOULD PUT SO MUCH WATER IN
2 THE GROUND THAT WE WOULD SATURATE, FULLY SATURATE THE
3 VADOSE ZONE. WITH THE THICKNESS OF THE VADOSE ZONES
4 WERE HAVE SEEN IN THE AMOUNT OF STORAGE SPACE --
5 SHOWINGS WE WILL NOT EVER FULLY SATURATE --

6 Q SORRY, I DIDN'T HEAR THAT.

7 A WE'RE NEVER GOING TO FULLY SATURATE THE
8 VADOSE ZONE UNDERNEATH THE IRRIGATION AREAS.

9 Q WHAT CONCLUSION DO YOU REACH FROM THAT?

10 A AT THE, SAY, 10 TO 20 YEAR LAG TIMES ARE
11 STILL REPRESENTATIVE OF WHAT COULD HAPPEN IN THE
12 ANTELOPE VALLEY.

13 Q OKAY. HAVE YOU FULLY EXPLAINED YOUR
14 OPINIONS WITH REGARD TO IRRIGATION FLOWS AND LAG TIMES?

15 A YES.

16 Q LET'S GO ON THEN. WHAT ARE THE OTHER INFLOW
17 TERMS THAT YOU USED?

18 A THE OTHER INFLOW TERMS WE USED WERE SEPTIC
19 TANK RECHARGE, RECYCLE WATER RECHARGED, AND THE
20 ARTIFICIAL RECHARGE OF IMPORTED WATER.

21 Q OKAY. ON EXHIBIT 65, WHAT'S THE SOURCE OF
22 THAT EXHIBIT?

23 A SEPTIC TANK RECHARGE AND RECYCLED WATER
24 RECHARGE WERE ESTIMATES -- SEPTIC TANK RECHARGE WERE
25 ESTIMATES PROVIDED BY MR. SCALMANINI IN -- IN THE
26 SUMMARY EXPERT REPORT. THE RECYCLE WATER RECHARGE CAME
27 FROM PETE LEEVER IN THE PREPARATION OF THE SUMMARY
28 EXPERT REPORT. AND THE IMPORTED WATER RECHARGE IS DATA

1 COLLECTED DURING THE PROBLEM STATEMENT PERIOD, AND THE
2 DATA SOURCES WERE BEING AVEK, LITTLEROCK IRRIGATION
3 DISTRICT, AND PALMDALE WATER DISTRICT.

4 Q WHAT DOES THIS CHART SHOW?

5 A IT SHOWS THE TIME HISTORY OF THESE RECHARGED
6 TERMS, AND THIS IS A STACK BAR CHART SHOWING RELATIVELY
7 MODEST IN THE BEGINNING, A FEW THOUSAND ACRE FEET AND
8 REACHING UP TO, SAY, 25,000-ACRE FEET NEAR THE END OF
9 THE PERIOD.

10 Q AND THE LAG TIME CONCEPT THAT YOU DISCUSSED
11 WITH RESPECT TO IRRIGATION RETURN FLOWS, HOW DOES THAT
12 APPLY TO THE ARTIFICIAL RECHARGE SITUATION?

13 A WELL, IN -- IN THE CASE OF ALL THESE TERMS,
14 THE LOADING RATE FOR EACH OF THESE COMPONENTS OR EACH OF
15 THESE TERMS IS VERY HIGH.

16 Q WHAT DO YOU MEAN BY LEADING RANGE?

17 A IF YOU WERE TO MEASURE THE RECHARGE ON A
18 UNIT BASIS, SAY, FEET PER YEAR, IT IS VERY LARGE
19 COMPARED TO THE VOLUME OF -- IN THE -- VERY LARGE
20 COMPARED TO STORAGE IN THE VADOSE ZONE THAT UNDERLIES
21 THE RECHARGE SITE.

22 SO IT WOULD SATURATE IT COMPLETELY IN A
23 YEAR, SOMETIMES MANY TIMES IN A YEAR. SO UNDER THOSE
24 CONDITIONS, THE TRANSIT TIME IS VERY FAST. SO IN OUR
25 ANALYSIS, WE ASSUME IT GETS DOWN WITHIN THE SAME YEAR
26 THAT IT IS RECHARGED.

27 Q SO YOU DID USE A -- YOUR CONCLUSION WITH
28 RESPECT TO LAG TIME WAS THAT IT GOT -- THE WATER GOT

1 DOWN IN THE SAME YEAR THAT IT WAS APPLIED TO LAND
2 SURFACE?

3 A THAT'S CORRECT.

4 Q WHAT ARE YOUR CONCLUSIONS, THEN, REGARDING
5 ARTIFICIAL RECHARGE?

6 A THE ARTIFICIAL RECHARGE BASED ON OUR
7 LAG-TIME ESTIMATES OF 10 TO 20 YEARS RANGE BETWEEN
8 55,000-ACRE FEET PER YEAR AND 59,000-ACRE FEET PER YEAR
9 OR 55 TO 65,000-ACRE FEET.

10 Q NOW I WAS ASKING ABOUT ARTIFICIAL RECHARGE.
11 IS THAT WHAT YOU WERE ANSWERING?

12 A I'M SORRY. I MISUNDERSTOOD THE QUESTION.

13 Q DID YOU DRAW ANY CONCLUSIONS REGARDING THE
14 ARTIFICIAL RECHARGE? TELL YOU WHAT, I'LL WITHDRAW THAT
15 QUESTION. AND MAYBE IT IS EXPLAINED MORE EASILY IF WE
16 CAN GO TO EXHIBIT 66. WE SAW THIS A MINUTE AGO.

17 HAVE YOU NOW GONE THROUGH ALL THE TERMS IN
18 THIS EQUATION FOR DETERMINING NATURAL RECHARGE?

19 A YES.

20 Q AND BASED ON THAT, DID YOU COME UP WITH AN
21 ESTIMATE OF THE NATIONAL RECHARGE TO THE ANTELOPE VALLEY
22 ADJUDICATION AREA?

23 A YES.

24 Q WHAT IS THAT ESTIMATE, PLEASE? THIS, I
25 THINK, IS THE QUESTION THAT YOU WERE ANSWERING BEFORE?

26 A CORRECT. FOR LAG TIMES RANGING BETWEEN 10
27 AND 20 YEARS, WE CAME UP WITH ESTIMATES BETWEEN 60 TO
28 55,000-ACRE FEET A YEAR.

1 Q OKAY. AND COULD YOU ILLUSTRATE THAT WITH
2 YOUR EXHIBITS 67 AND -- LET'S START WITH 67. WAS THIS
3 EXHIBIT PREPARED BY YOU OR AT YOUR DIRECTION?

4 A YES.

5 Q WOULD YOU EXPLAIN THIS EXHIBIT AND SHOW HOW
6 YOU CAME TO THE NATIONAL RECHARGE ESTIMATE -- FIRST OF
7 ALL, THE TITLE IS NATURAL RECHARGE 1951 TO 2005 WITH
8 20-YEAR LAG.

9 A YES.

10 Q SO EXPLAIN HOW YOU CAME TO THIS -- TO THE
11 NATURAL RECHARGE ESTIMATE IN THIS CHART AND WHAT IT IS.

12 A OKAY. THIS CHART IS VERY SIMILAR TO THE ONE
13 THAT YOU HAVE SEEN BEFORE DEALING WITH STORAGE CHANGE.
14 IT HAS BEEN EXPANDED TO INCLUDE A COLUMN FOR RETURN
15 FLOWS AND ARTIFICIAL RECHARGE. AND, BASICALLY, WE ARE
16 TRACKING THE EQUATION WE JUST TALKED ABOUT FROM LEFT TO
17 RIGHT ACROSS THIS -- EACH ROW.

18 THE RETURN FLOWS NUMBER -- REMEMBER, THESE
19 ARE AGGREGATE RETURN FLOWS FOR A PERIOD. IT CORRESPONDS
20 TO '51 AND '62, BUT IT IS USING A RETURN FLOWS FOR THE
21 20-YEAR LAG SO THAT WOULD REALLY BE, SAY -- LET'S SEE IF
22 I CAN DO THE MATH IN MY HEAD, GOING BACK INTO 30'S AND
23 '40'S. SO THIS AGGREGATED RETURN HERE FOR THE RETURN
24 FLOWS -- RETURN FLOW AT 20-YEAR LAG WHICH PRECEDE EVEN
25 THE '51 OR '62 PERIOD. WE MOVE THAT WINDOW 20 YEARS TO
26 CAPTURE THE RETURN FLOWS.

27 Q SO BY THAT, YOU MEAN THE WATER ACCOUNTED FOR
28 IN THIS WATER BALANCE WOULD HAVE BEEN APPLIED TO THE

1 LAND IN THE 1930'S AND THE 1940'S?

2 A CORRECT. THAT IS DONE FOR EACH OF THESE
3 PERIODS GOING DOWN. AND EMBEDDED IN HERE IN THESE
4 RETURN FLOWS ARE SEPTIC TANK RECHARGE AND RECYCLED WATER
5 RECHARGE OCCURRING IN THE SAME YEAR. IF YOU WENT BACK
6 AND TRY TO BACK CALCULATE IT, YOU WOULD HAVE TO ASSUME
7 THOSE ARE -- WHAT WE CALL ZERO LAG ARE IN THE SAME YEAR.
8 THESE ARE ARTIFICIAL RECHARGE WHICH IS COMPOSED OF SOME
9 INJECTION, AND THEN A RECHARGE TEST ON LITTLEROCK CREEK.

10 SO IF YOU GO ACROSS THIS AND YOU TAKE THE
11 OUTFLOW, ADD IT TO THE CHANGE AND STORAGE HERE, AND
12 SUBTRACT THESE TWO INFLOW TERMS, YOU GET A RECHARGE --
13 NATURAL RECHARGE OVER THE PERIOD OF 347,000-ACRE FEET.

14 Q AND THAT AGAIN REFERS TO THE PERIOD 1951 TO
15 1962?

16 A CORRECT.

17 Q OKAY. GO ON.

18 A IF YOU DIVIDE THAT BY THE LENGTH OF THAT
19 PERIOD WHICH IS 12 YEARS, YOU GET A NATURAL RECHARGE
20 ESTIMATE OF ABOUT 29,000-ACRE FEET.

21 SO WE DO THIS FOR ALL STORAGE CHANGE
22 PERIODS, THE LAST ONE BEING 1998 TO 2005. AND YOU CAN
23 SEE WE HAVE VARIABLE ESTIMATES OF NATURAL RECHARGE.

24 Q WHY DOES IT VARY SO MUCH?

25 A IT VARIES DUE TO THE CHANGE OF STORAGE, THE
26 PUMPING. AND IMPLICIT IN THIS IS -- THIS IS RESIDUAL
27 TERM -- HAS HYDROLOGY BUILT INTO THE RESIDUAL RETURN.

28 Q WHAT DOES THAT MEAN?

1 A THE WAY WE CALCULATE NATURAL RECHARGE, IT IS
2 THE DEPENDENT VARIABLE OF EVERYTHING ELSE. SOLE IT IS
3 THE RESULT OR RESIDUAL OF THAT CALCULATION. SO WE --

4 Q I'M SORRY. GO AHEAD. FINISH YOUR ANSWER.

5 A I'M DONE.

6 Q WHEN YOU SAY IT HAD THE HYDROLOGY BUILT IN,
7 WHAT DID YOU MEAN BY THAT?

8 A THIS IS WHAT THE RAINFALL IN THE WATERSHED
9 IS PRODUCING, IT'S WHAT WE ABLE TO CALCULATE IT'S
10 PRODUCING. SO THIS IS THE -- THE RECHARGE FROM
11 PRECIPITATION.

12 Q AND WOULD THE RAINFALL HAD VARIED OVER THE
13 PERIOD 1951 TO 2005?

14 A YES.

15 Q AND IS THAT VARIANCE REFLECTED IN THESE
16 DIFFERENT NATURAL RECHARGE FIGURES FOR THESE DIFFERENT
17 PERIODS?

18 A NOT QUITE AS DIRECTLY AS ONE WOULD THINK,
19 BUT IT IS.

20 Q OKAY. AND THEN YOU HAVE A SUMMARY LINE,
21 SUMMARY ROW, AT THE BOTTOM. WILL YOU EXPLAIN THAT?

22 A YES. THIS 1951 TO 2005, IT SHOWS ON AN
23 AVERAGE ANNUAL BASIS SHOWING TOTAL OUTFLOW ON AVERAGE
24 ANNUAL BASIS IS 241,000 ROUGHLY; THAT THE ANNUAL CHANGE
25 OF STORAGE IS ABOUT MINUS 99,000. THE AVERAGE RETURN
26 FLOW IS ABOUT 86,000. THE AVERAGE NATURAL -- OR
27 ARTIFICIAL RECHARGE IS ABOUT 100-ACRE FEET.

28 AND THEN OVER THE WHOLE PERIOD THE AVERAGE

1 NATURAL RECHARGE IS 55,000-ACRE FEET.

2 Q AND THAT'S THE AVERAGE NATURAL RECHARGE WITH
3 THE ASSUMPTION OF A 20-YEAR LAG; CORRECT?

4 A YES. OVER A 1951 TO 2005 PERIOD.

5 Q ALL RIGHT. HAVE YOU FULLY EXPLAINED THIS
6 TABLE, OR SHOULD WE GO ONTO THE NEXT ONE?

7 A YES.

8 Q OKAY. EXHIBIT 68, EXPLAIN THAT ONE, PLEASE.

9 A WELL, THIS IS A -- THIS IS NATURAL RECHARGE
10 1951 WITH A 15-YEAR LAG. THIS CHART IS ALMOST
11 COMPLETELY IDENTICAL TO THE PRIOR CHART EXCEPT FOR THIS
12 COLUMN UNDER RETURN FLOWS. THOSE ARE CHANGED BECAUSE
13 NOW THAT WINDOW OF TIME HAS ONLY BEEN SHIFTED 15 YEARS.

14 THE REPORTER: COULD YOU REPEAT THAT FOR ME.

15 THE WITNESS: BECAUSE THE WINDOW OF TIME THAT WE
16 ARE USING FOR RETURN FLOWS HAS BEEN SHIFTED ONLY 15
17 YEARS.

18 THE REPORTER: THANK YOU.

19 THE WITNESS: SO EVERYTHING PRETTY MUCH LOOKS THE
20 SAME. YOU'LL SEE THE NATURAL RECHARGE NUMBERS CHANGING
21 A LITTLE BIT ON THE FAR RIGHT COLUMNS BECAUSE OF THAT.
22 AND THAT THE AVERAGE NATURAL RECHARGE OVER THE PERIOD
23 WENT UP TO ABOUT 57,000.

24 Q OKAY. EXHIBIT 69?

25 A EXHIBIT 69, AGAIN, IDENTICAL TO THE FIRST
26 ONE OF THESE CHARTS THAT WE LOOKED AT EXCEPT FOR RETURN
27 FLOWS. THEY HAVE CHANGED AGAIN, AND WE ARE GETTING --
28 NOW WE ARE SAMPLING A TEN-YEAR WINDOW -- OR A TEN-YEAR

1 A YES.

2 Q AND CAN YOU QUANTIFY PERCENTAGE-WISE HOW
3 MUCH OF THE OVERALL GROUNDWATER BASIN DOES YOUR COLORED
4 AREA -- THAT IS AREA FOR WHICH YOU DID A STORAGE CHANGE
5 CALCULATION -- WHAT PERCENTAGE OF THE WHOLE IS THAT?

6 A IT IS IN THE 60 PERCENT RANGE, BETWEEN 60
7 AND 70 PERCENT I'M PRETTY -- SOMEWHERE IN THAT RANGE.

8 Q WOULD 63 PERCENT SOUND CORRECT AS A NUMBER
9 FROM THE SUMMARY EXPERT REPORT?

10 A IT COULD BE.

11 Q DO YOU KNOW WHERE THE NATURAL RECHARGE TO
12 THE ANTELOPE VALLEY COMES FROM PREDOMINANTLY?

13 MR. BUNN: OBJECTION. BEYOND THE SCOPE.

14 MR FIFE: HIS WHOLE CALCULATION WAS ABOUT NATURAL
15 RECHARGE.

16 THE COURT: HE HAS ALREADY TESTIFIED HE IS BASING
17 HIS OPINION ON ANOTHER EXPERT'S DATA AND DATA FROM THE
18 USGS. SO YOU CAN ASK HIM THAT QUESTION. I DON'T KNOW
19 HOW FAR YOU WILL GET.

20 THE WITNESS: IT COMES FROM STREAM FLOW RECHARGE.
21 BY MR FIFE:

22 Q WOULD THAT BE FROM THE MOUNTAIN AREAS?

23 A YES.

24 Q AND SO IF YOUR AREA OF STORAGE CHANGE IS --
25 SORRY. STRIKE THAT. SO AS THE STREAM FLOW COMES OFF OF
26 THE MOUNTAINS, WHERE IS THE FIRST PLACE THAT YOU WOULD
27 EXPECT IT TO ARRIVE IN THE GROUNDWATER BASIN?

28 MR. DUNN: OBJECTION. VAGUE.

1 BY MR FIFE:

2 Q WOULD IT BE THE GRAY AREAS OF EXHIBIT 53,
3 THE AREA BETWEEN WHERE YOU DID THE STORAGE CHANGE AND
4 THE BOUNDARY OF THE GROUNDWATER BASIN?

5 A I WOULD HAVE TO CONSULT. I CAN'T ANSWER
6 THAT QUESTION RIGHT NOW.

7 Q AND SO YOU CAN'T ANSWER THE QUESTION AS TO
8 WHETHER IF THERE WAS A STORAGE CHANGE OCCURRING, A
9 POSITIVE STORAGE CHANGE, FOR EXAMPLE, FROM A HIGH
10 PRECIPITATION EVENT WHERE THAT STORAGE CHANGE WOULD
11 MANIFEST FIRST WITHIN A GROUNDWATER BASIN?

12 A IT WOULD MANIFEST PROBABLY ON THE FRINGE OF
13 THE BASIN.

14 Q TO BE CLEAR THE FRINGE OF THE BASIN WOULD BE
15 THIS AREA ALMOST ALL AWAY AROUND THE BASIN THAT HAS BEEN
16 EXCLUDED FROM YOUR STORAGE CHANGE CALCULATION; IS THAT
17 CORRECT?

18 MR. WEEKS: OBJECTION. THIS IS ALSO OUTSIDE THE
19 SCOPE OF HIS TESTIMONY. HE DIDN'T TESTIFY WHERE IT
20 MANIFESTED ANYWHERE IN -- THE BASIN IT WAS CALCULATED --

21 THE COURT: HE IS BEING CROSS-EXAMINED CONCERNING
22 HIS OPINION ABOUT WATER STORAGE, GROUND STORAGE AREA.
23 HE CAN ANSWER THAT QUESTION.

24 THE WITNESS: CAN I HEAR THE QUESTION AGAIN.

25 THE COURT: HE ASKED IF THE FRINGE AREA INCLUDES
26 THE ENTIRE AREA AROUND THE BASIN.

27 THE WITNESS: TO BE CLEAR, WE ARE TALKING ABOUT --
28 TO BE CLEAR WE ARE TALKING ABOUT THIS AREA AROUND THE

1 SAN GABRIELS?

2 BY MR. FIFE:

3 Q YES, OR THE AREA ALL AWAY AROUND, BASICALLY,
4 WHERE THE GRAY IS VERSUS WHERE THE COLORED AREA IS?

5 A COULD YOU READ THE QUESTION.

6

7 (RECORD READ.)

8

9 THE WITNESS: IT IS NOT INCLUDED IN THE STORAGE
10 CHANGE CALCULATION.

11 BY MR FIFE:

12 Q AND THIS WOULD BE THE AREA THAT YOU WOULD
13 EXPECT TO FIRST SEE AN MANIFESTATION OF STORAGE CHANGE
14 FROM A HIGH FLOW EVENT SUCH AS A STORM; IS THAT CORRECT?

15 A IT COULD SHOW UP IN THE AREA. WE ALSO
16 CALCULATE CHANGE OF STORAGE, TOO, AS A FLOWS OFF THE
17 MOUNTAINS AND ACROSS THE VALLEY FLOOR.

18 Q WHERE WOULD YOU EXPECT IT TO SHOW UP FIRST?

19 A IT IS GOING TO SHOW UP FIRST WHEREVER IT
20 RECHARGES.

21 Q IN YOUR APPENDIX E YOU HAVE IN YOUR SECTION
22 FOUR, YOU HAVE A LIST OF REFERENCES THAT INFORMED YOUR
23 WORK FOR THIS CASE. YOUR LAST REFERENCE IS A WORK BY
24 WILDERMUTH ENVIRONMENTAL DATED 2007 ENTITLED 2007-CBWM
25 GROUNDWATER MODEL DOCUMENTATION AND EVALUATION OF THE
26 PIECE TWO PROJECT DESCRIPTION DATED NOVEMBER 2007.

27 DO YOU RECALL THAT?

28 A YES.

1 Q AND CAN YOU TELL US WHAT THAT DOCUMENT IS
2 ABOUT?

3 A THAT DOCUMENT IS A REPORT THAT DOCUMENTS THE
4 DEVELOPMENT OF FAIRLY HIGH RESOLUTION GROUNDWATER MODEL
5 FOR THE CHINO BASIN AND THE APPLICATION OF THAT MODEL TO
6 EVALUATE A GROUNDWATER MANAGEMENT PLAN FOR THE CHINO
7 BASIN.

8 Q AND CAN YOU DESCRIBE THE PARTICULARS OF THAT
9 GROUNDWATER MANAGEMENT PLAN AS IT PERTAINS TO THE
10 DOCUMENT LISTED HERE IN YOUR REFERENCES?

11 MR. BUNN: OBJECTION. RELEVANCE.

12 THE COURT: SUSTAINED.

13 MR FIFE: A REFERENCE HE USED IN HIS WORK FOR THIS
14 CASE.

15 THE COURT: YOUR OBJECTION WAS SUSTAINED AS TO THE
16 QUESTION ASKED.

17 BY MR FIFE:

18 Q HOW DID THIS DOCUMENT INFORM YOUR WORK IN
19 THIS CASE?

20 A WELL, THAT DOCUMENT CONTAINS -- SUMMARIZES A
21 GREAT DEAL OF WORK AS TO LAG TIME THAT YOU WOULD EXPECT
22 IN ALLUVIAL BASIN FROM IRRIGATION RETURN FLOWS.

23 Q HOW DID THOSE LAG TIMES WORK INTO YOUR,
24 QUOTE, EVALUATION OF THE PIECE TWO PROJECT DESCRIPTION?

25 A IT -- WELL, WE HAD TO CALIBRATE THIS HIGH
26 RESOLUTION GROUNDWATER MODEL. AND IN THE CALIBRATION OF
27 THAT MODEL, WE HAD IRRIGATION RETURN FLOWS COMING FROM A
28 HEAVY AGRICULTURAL PERIOD IN THE PAST -- EXCUSE ME. THE

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SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES

DEPARTMENT NO. 1 HON. JACK KOMAR, JUDGE

COORDINATION PROCEEDING	)	
SPECIAL TITLE (RULE 1550B)	)	
	)	JUDICIAL COUNCIL
ANTELOPE VALLEY GROUNDWATER CASES	)	COORDINATION
	)	NO. JCCP4408
	)	
PALMDALE WATER DISTRICT AND	)	SANTA CLARA CASE NO.
QUARTZ HILL WATER DISTRICT,	)	1-05-CV-049053
	)	
CROSS-COMPLAINANTS,	)	
	)	
VS.	)	
	)	
LOS ANGELES COUNTY WATERWORKS,	)	
DISTRICT NO. 40, ET AL,	)	
	)	
CROSS-DEFENDANTS.	)	
	)	

STATE OF CALIFORNIA)
) SS.
COUNTY OF LOS ANGELES)

I, GINGER WELKER, OFFICIAL REPORTER OF THE
SUPERIOR COURT OF THE STATE OF CALIFORNIA, FOR THE
COUNTY OF LOS ANGELES, DO HEREBY CERTIFY THAT THE
TRANSCRIPT DATED JANUARY 5, 2011 COMPRISES A FULL, TRUE,
AND CORRECT TRANSCRIPT OF THE PROCEEDINGS HELD IN THE
ABOVE ENTITLED CAUSE.

DATED THIS 10TH DAY OF JANUARY, 2011.

OFFICIAL REPORTER, CSR #5585