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

REPORTER'S TRANSCRIPT OF PROCEEDINGS

WEDNESDAY, JANUARY 5, 2011

APPEARANCES:

(SEE APPEARANCE PAGES)

GINGER WELKER, CSR #5585
OFFICIAL REPORTER

APPEARANCES:

TEJON RANCH CORP	KUHS & PARKER BY: WILLIAM KUHS ROBERT G. KUHS 1200 TRUXTUN AVENUE SUITE 200 BAKERSFIELD, CA (661) 322-4004
L.A. COUNTY WATERWORKS DISTRICT NO. 40	BEST, BEST & KRIEGER, LLP BY: JEFFREY V. DUNN STEFANIE HEDLUND 5 PARK PLAZA, SUITE 1500 IRVINE, CA 92614 (949) 263-2600
PALMDALE WATER DISTRICT	LAGERLOF, SENECAL, GOSNEY & KRUSE, LLP BY: THOMAS S. BUNN III 301 NORTH LAKE AVENUE 10TH FLOOR PASADENA, CA 91101-4108 (626) 793-9400
ANTELOPE VALLEY GROUNDWATER AGREEMENT ASSOCIATION (AGWA)	BROWNSTEIN, HYATT, FARBER & SCHRECK BY: MICHAEL FIFE 21 EAST CARRILLO STREET SANTA BARBARA, CA 93101 (805) 963-7000
L.A. COUNTY WATERWORKS DISTRICT NO. 40	OFFICE OF THE COUNTY COUNSEL, COUNTY OF L.A. BY: WARREN R. WELLEN 500 WEST TEMPLE STREET 6TH FLOOR LOS ANGELES, CA 90012 (213) 974-9668
LOS ANGELES COUNTY SANITATION DISTRICTS NOS. 14 & 20	ELLISON, SCHNEIDER & HARRIS BY: CHRISTOPHER M. SANDERS 2015 H STREET SACRAMENTO, CA 95811-3109 (916) 447-2166

APPEARANCES (CONTINUED)

CITY OF LANCASTER & ROSAMOND CSD	MURPHY & EVERTZ BY: DOUGLAS J. EVERTZ 650 TOWN CENTER DRIVE SUITE 550 COSTA MESA, CA 92626 (714) 277-1700
ANTELOPE VALLEY EAST KERN WATER AGENCY (AVEK)	BRUNICK, MCELHANEY & BECKETT BY: WILLIAM J. BRUNICK 1839 COMMERCENTER WEST SAN BERNARDINO, CA 92408 (909) 889-8301
NEW ANAVERDE, LLC	PIRCHER, NICHOLS & MEEKS BY: JAMES L. GOLDMAN 1925 CENTURY PARK EAST SUITE 1700 LOS ANGELES, CA 90067 (310) 201-8927
LITTLEROCK CREEK IRRIGATION DISTRICT & PALM RANCH IRRIGATION DISTRICT:	LEMIEUX & O'NEILL BY: WAYNE K. LEMIEUX W. KEITH LEMIEUX 2393 TOWNSGATE ROAD SUITE 201 WESTLAKE VILLAGE, CA 91361 (805) 495-4770
BOLTHOUSE PROPERTIES, INC.	CLIFFORD & BROWN BY: RICHARD G. ZIMMER BANK OF AMERICA BUILDING 1430 TRUXTUN AVENUE SUITE 900 BAKERSFIELD, CA 93301 (661) 322-6023
CITY OF LOS ANGELES	LOS ANGELES CITY ATTORNEY BY: JULIE RILEY 111 NORTH HOPE LOS ANGELES, CA 90051 (213) 367-4513

APPEARANCES (CONTINUED)

THE UNITED STATES	U.S. DEPARTMENT OF JUSTICE ENVIRONMENT & NATURAL RESOURCES DIVISION BY: R. LEE LEININGER 1961 STOUT STREET, 8TH FLOOR DENVER, CO 80294 (303) 844-1364
U.S. BORAX	MORRISON & FOERSTER, LLP BY: WILLIAM M. SLOAN 425 MARKET STREET SAN FRANCISCO, CA 94105 (415) 268-7209
QUARTZ HILL WATER DISTRICTS	CHARLTON WEEKS BY: BRADLEY T. WEEKS 1007 W. AVE. M-14, SUITE A PALMDALE, CA 93551 (661)265-0969
RICHARD A. WOOD SMALL PUMPER CLASS	OFFICES OF MICHAEL MCLACHLAN BY: MICHAEL D. MCLACHLAN DANIEL M. O'LEARY 10490 SANTA MONICA BLVD. LOS ANGELES, CA 90025 (310) 954-8270
DIAMOND FARMING COMPANY AND CRYSTAL ORGANIC	LEBEAU, THELEN, MCINTOSH & CREAR BY: BOB H. JOYCE 5001 EAST COMMERCENTER DR. P.O. BOX 12092 BAKERSFIELD, CA 93389-2092 (661) 325-8962
PHELAN PINON HILLS	SMITH TRAGER, LLP BY: SUSAN M. TRAGER 19712 MAC ARTHUR BLVD. SUITE 120 IRVINE, CA 92612 (949) 752-8971

APPEARANCE (CONTINUED)

PHELAN PINON HILLS, CSD	ALESHIRE & WYNDER, LLP BY: WESLEY A. MILIBAND 18881 VON KARMAN AVENUE SUITE 400 IRVINE, CA 92612 (949) 223-1170
CALIFORNIA WATER SERVICES COMPANY	JOHN S. TOOTLE CORPORATE COUNSEL 2632 W. 237TH STREET TORRANCE, CA 90505-5272 (310) 257-1488

* * *

I N D E X

W I T N E S S E S

E X H I B I T S

(EXHIBITS 56 THROUGH 74 WERE PREVIOUSLY MARKED FOR IDENTIFICATION AND REFERRED TO DURING TODAY'S HEARING. IT WAS NOT DESIGNATED AS TO WHEN THEY WERE MARKED. THESE EXHIBITS ARE A SERIES OF ANTELOPE VALLEY WATER BASIN CHARTS.)

* * *

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

A YES.

Q COULD YOU RESTATE THAT, PLEASE.

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

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

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

THE COURT: DO YOU WANT TO RESPOND TO THAT?

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

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

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

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

MR. BUNN: YES.

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

MR. ZIMMER: THANK YOU, YOUR HONOR.

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

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

A YES.

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

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

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

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

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

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

A YES.

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

A YES.

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

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

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

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

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

A THE SOURCE OF THE INFORMATION IN THIS

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

Q DID HE PREPARE THE CHART?

A I PREPARED THE CHART.

Q BASED ON HIS DATA?

A YES.

Q WHAT DOES THIS SHOW?

A THIS SHOWS --

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

THE COURT: CONCERNING WHAT?

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

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

BY MR. BUNN:

Q THANK YOU. WHAT DOES THAT CHART SHOWS?

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

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

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

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

A YES.

Q WHAT DOES IT SHOW?

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

THE REPORTER: PLEASE SPELL THAT FOR ME, SIR.

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

THE REPORTER: THANK YOU.

THE WITNESS: THAT EXTENDS FROM THE GROUND SURFACE OR THE BOTTOM OF THE ROOT ZONE TO THE SATURATED ZONE.

BY MR. BUNN:

Q WHAT IS THE SATURATE ZONE?

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

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

A IN THE VADOSE ZONE.

Q OKAY.

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

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

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

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

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

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

MR. ZIMMER: THE NATURE OF THE OBJECTION IS THAT

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

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

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

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

MR. ZIMMER: THANK YOU, YOUR HONOR.

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

MR. BUNN: THANK YOU.

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

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

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

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

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

BY MR. BUNN:

Q GO ON, PLEASE.

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

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

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

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

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

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

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

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

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

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

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

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

RECHARGE EVENT THAT OCCURRED PRIOR TO '51.

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

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

A COULD YOU REASK THE QUESTION.

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

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

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

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

Q ACCOUNT FOR THE --

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

Q THIS IS EXHIBIT 62?

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

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

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

A WE STARTED WITH ASSUMING A RANGE OF LAG

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

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

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

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

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

Q AND THE WORD YOU USED WAS "LENTICULAR"?

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

THE REPORTER: MAY I HAVE A SPELLING.

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

BY MR. BUNN:

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

A NO.

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

A I BELIEVE I EXPLAINED IT.

Q OKAY.

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

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

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

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

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

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

Q LET'S GO TO EXHIBIT 64.

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

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

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

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

BY MR. BUNN:

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

A YES.

Q WHAT DOES IT SHOW?

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

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

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

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

IF YOU FOLLOW OVER TO '57 WHICH IS TEN YEARS

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

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

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

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

A 1986.

Q IT SHOULD BE 1986?

A YES.

Q WHAT CONCLUSIONS CAN YOU DRAW FROM THIS FACT?

A WELL, ONE OF THE CONCERNS IN LOOKING AT

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

Q SORRY, I DIDN'T HEAR THAT.

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

Q WHAT CONCLUSION DO YOU REACH FROM THAT?

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

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

A YES.

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

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

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

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

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

Q WHAT DOES THIS CHART SHOW?

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

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

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

Q WHAT DO YOU MEAN BY LEADING RANGE?

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

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

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

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

A THAT'S CORRECT.

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

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

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

A I'M SORRY. I MISUNDERSTOOD THE QUESTION.

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

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

A YES.

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

A YES.

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

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

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

A YES.

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

A YES.

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

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

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

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

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

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

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

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

A CORRECT.

Q OKAY. GO ON.

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

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

Q WHY DOES IT VARY SO MUCH?

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

Q WHAT DOES THAT MEAN?

A THE WAY WE CALCULATE NATURAL RECHARGE, IT IS THE DEPENDENT VARIABLE OF EVERYTHING ELSE. SOLE IT IS THE RESULT OR RESIDUAL OF THAT CALCULATION. SO WE --
Q I'M SORRY. GO AHEAD. FINISH YOUR ANSWER.
A I'M DONE.
Q WHEN YOU SAY IT HAD THE HYDROLOGY BUILT IN, WHAT DID YOU MEAN BY THAT?
A THIS IS WHAT THE RAINFALL IN THE WATERSHED IS PRODUCING, IT'S WHAT WE ABLE TO CALCULATE IT'S PRODUCING. SO THIS IS THE -- THE RECHARGE FROM PRECIPITATION.
Q AND WOULD THE RAINFALL HAD VARIED OVER THE PERIOD 1951 TO 2005?
A YES.
Q AND IS THAT VARIANCE REFLECTED IN THESE DIFFERENT NATURAL RECHARGE FIGURES FOR THESE DIFFERENT PERIODS?
A NOT QUITE AS DIRECTLY AS ONE WOULD THINK, BUT IT IS.
Q OKAY. AND THEN YOU HAVE A SUMMARY LINE, SUMMARY ROW, AT THE BOTTOM. WILL YOU EXPLAIN THAT?
A YES. THIS 1951 TO 2005, IT SHOWS ON AN AVERAGE ANNUAL BASIS SHOWING TOTAL OUTFLOW ON AVERAGE ANNUAL BASIS IS 241,000 ROUGHLY; THAT THE ANNUAL CHANGE OF STORAGE IS ABOUT MINUS 99,000. THE AVERAGE RETURN FLOW IS ABOUT 86,000. THE AVERAGE NATURAL -- OR ARTIFICIAL RECHARGE IS ABOUT 100-ACRE FEET.
AND THEN OVER THE WHOLE PERIOD THE AVERAGE

NATURAL RECHARGE IS 55,000-ACRE FEET.

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

A YES. OVER A 1951 TO 2005 PERIOD.

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

A YES.

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

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

THE REPORTER: COULD YOU REPEAT THAT FOR ME.

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

THE REPORTER: THANK YOU.

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

Q OKAY. EXHIBIT 69?

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

A YES.

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

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

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

A IT COULD BE.

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

MR. BUNN: OBJECTION. BEYOND THE SCOPE.

MR FIFE: HIS WHOLE CALCULATION WAS ABOUT NATURAL RECHARGE.

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

THE WITNESS: IT COMES FROM STREAM FLOW RECHARGE.

BY MR FIFE:

Q WOULD THAT BE FROM THE MOUNTAIN AREAS?

A YES.

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

MR. DUNN: OBJECTION. VAGUE.

BY MR FIFE:

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

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

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

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

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

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

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

THE WITNESS: CAN I HEAR THE QUESTION AGAIN.

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

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

SAN GABRIELS?

BY MR. FIFE:

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

A COULD YOU READ THE QUESTION.

(RECORD READ.)

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

BY MR FIFE:

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

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

Q WHERE WOULD YOU EXPECT IT TO SHOW UP FIRST?

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

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

DO YOU RECALL THAT?

A YES.

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

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

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

MR. BUNN: OBJECTION. RELEVANCE.

THE COURT: SUSTAINED.

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

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

BY MR FIFE:

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

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

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

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

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

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.

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OFFICIAL REPORTER, CSR #5585