STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	
APPLICATION OF SDX RESOURCES, INC., FOR APPROVAL OF A WATERFLOOD PROJECT, EDDY COUNTY, NEW MEXICO	)	CASE NO. 13,923

ORIGINAL

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REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: WILLIAM V. JONES, Jr., Hearing Examiner

May 24th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, WILLIAM V. JONES, Jr., Hearing Examiner, on Thursday, May 24th, 2007, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

May 24th, 2007
Examiner Hearing
CASE NO. 13,923

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A P P E A R A N C E S

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By: OCEAN MUNDS-DRY

* * *

WHEREUPON, the following proceedings were had at 8:56 a.m.:

EXAMINER JONES: And let's call Case 13,923, Application of SDX Resources, Inc., for approval of a waterflood project, Eddy County, New Mexico.

Call for appearances.

MS. MUNDS-DRY: Mr. Examiner, Ocean Munds-Dry with the law firm of Holland and Hart, here representing SDX Resources, Inc., this morning.

I have two witnesses.

EXAMINER JONES: Any other appearances?

Will the witnesses please stand to be sworn?

(Thereupon, the witnesses were sworn.)

MS. MUNDS-DRY: Mr. Examiner, I'd like to call Richard Jordan.

Mr. Examiner, you may recall this Application. We've sort of done this in two parts.

Administratively, I believe you're reviewing the Application for the authorization to inject, and this Application is -- this part of the Application has been brought to approve the initial waterflood project.

EXAMINER JONES: Got it right here.

RICHARD JORDAN,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. MUNDS-DRY:

Q. Would you please state your name for the record?

A. Richard Jordan.

Q. Where do you reside?

A. Midland, Texas.

Q. And by whom are you employed?

A. SDX Resources.

Q. Have you previously testified before the Division?

A. Yes, I have.

Q. And at the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Application filed in this case?

A. Yes.

Q. And have you made a geologic study of the area that is subject of the Application?

A. Yes.

Q. And are you prepared to share the results of your

work --

A. Yes.

Q. -- with the Examiner?

A. Yes, I am.

MS. MUNDS-DRY: Mr. Jones, we would tender Mr. Jordan as an expert in petroleum geology.

EXAMINER JONES: How do you spell your last name?

THE WITNESS: J-o-r-d-a-n.

EXAMINER JONES: Okay, Mr. Jordan is qualified as an expert in petroleum geology.

Q. (By Ms. Munds-Dry) Mr. Jordan, will you briefly summarize what SDX seeks with this Application?

A. To initiate a waterflood in Section 32, 17 South, 28 East.

Q. And what formation do you seek to inject in?

A. In the San Andres.

Q. And is there another waterflood over this area?

A. Over the area or around the area?

Q. Around the area.

A. Yes, there are, yes.

Q. Okay. Will you generally describe the geology of the formation in this subject area?

A. San Andres is in general a shoaling upward sequence where you -- in this area you see a transition as you come up, throughout the formation, from a subtidal to

intertidal to supertidal deposits, where the supertidal basically sealed the lower part of the San Andres, a lot of the anhydrite plugging, very tight formation.

As you get to the middle San Andres, you'll -- intertidal shoreline-type facies, and at depth they get more subtidal, with less dolomitization, but still dolomitized as well.

Q. And what's the thickness of the formation in this area?

A. Overall, 1000, 1100 foot. The pay interval we're looking at is approximately 350 to 450 feet.

Q. Thank you. If you could please turn to SDX Exhibit Number 1, which I believe is behind Tab Number 7.

Mr. Examiner, we're going to test your skill of following us along this morning.

EXAMINER JONES: Okay.

MS. MUNDS-DRY: We're going to be kind of jumping around this book a little bit.

Q. (By Ms. Munds-Dry) What is Exhibit Number 1?

A. This is a top San Andres structure map. The SDX acreage in the area is depicted in yellow. And the map indicates a structural ridge trending east-northeast, which actually extends from the Artesia area --

MS. MUNDS-DRY: Mr. Examiner, I believe that's behind Tab 7.

EXAMINER JONES: Tab 7, sorry.

MS. MUNDS-DRY: See, I told you we were going to test you.

EXAMINER JONES: Already failed.

MS. MUNDS-DRY: And Mr. Examiner, we've also brought you the larger versions of this, if you would like to use those as well.

EXAMINER JONES: That's okay --

MS. MUNDS-DRY: Okay.

EXAMINER JONES: -- maybe not.

MR. BROOKS: Where is Exhibit Number 1?

MS. MUNDS-DRY: Go to Tab Number 7.

EXAMINER JONES: Tab 7.

MR. BROOKS: Tab 7, okay. Strange arrangement.

MS. MUNDS-DRY: Sorry about that.

EXAMINER JONES: It's all right.

MR. BROOKS: Okay.

MS. MUNDS-DRY: We'll make it lively.

Q. (By Ms. Munds-Dry) Mr. Jordan, go ahead.

A. That structural ridge serves as the locus point, if you will, for a number of these fields which are stacked in this area, compacting the lateral facies transition which gave rise to the reservoirs, beginning with the Abo all the way up to the Grayburg reservoirs in the area.

Q. And what does the yellow indicate here on the

map?

A. That is the SDX acreage position in the area.

Q. And can you show the Examiner where the initial well for injection is located?

A. It's indicated by an orange triangle in the southwest portion of Section 32.

Q. Thank you, Mr. Jordan.

If you'd please turn to Exhibit Number 2, which I believe is behind Tab Number 8, and identify and review that for the Examiner.

A. This exhibit is a stratigraphic cross-section. The datum is hung on the top of the Premier sand interval, which is the basal Grayburg, and depicts the relationship of the San Andres in this portion of the SDX position.

You'll note the upper San Andres is a very tight unit with the exception of that very thin Lovington sand interval. If you come down, we have highlighted -- the density log is off-scale, just emphasizing how tight that rock is. It's highlighted in purple.

EXAMINER JONES: Okay.

THE WITNESS: Approximately 400 foot into the San Andres, or halfway into the middle San Andres as we designate it, you'll note we start incurring porosity. It's highlighted in red in track 3 of the logs on each of the cross-section wells.

Also indicated in the center bar is the perforation intervals in each of these wells. Well completion histories are noted at the base.

As you go down below that middle San Andres, upper/lower San Andres completion interval, you'll not that we get considerably tighter again, based upon the log presentation.

If I can direct your attention to Section 9 while the cross-section is still out -- It's in your book behind Tab 9.

Q. (By Ms. Munds-Dry) Tab 9, Mr. Jordan?

A. I apologize, it's behind Tab 9.

EXAMINER JONES: Tab 9?

Q. (By Ms. Munds-Dry) And I believe this is what has been marked Exhibit Number 3; is that correct?

A. This is a sidewall core report we took on the Northwest State Number 7 well, which SDX drilled in September of 1999. You'll note that the completion interval in that well was 2472 to 2762, and that encompasses the upper seven of those San Andres sidewall cores. A porosity range in there from 5 percent to 8 percent, with permeabilities ranging from .05 millidarcies to 5.8.

If you go below that, you not that we get considerably tighter.

If you turn to the next page behind the core analysis report, that rather ugly rock is that lower San Andres that's below the completion interval. It's tight wackestone, you've got fossils, a lot of which have been replaced, but you can still see large fragments. This is a lower-energy, tighter environment.

If you would -- you'll note, also, we're looking at .08 millidarcies on that sample, with three, sub-four percent measured in thin section on the porosity.

The next page is representative of the completion-interval rock, the blue indicating the porosity there from thin-section analysis, the difference being 9 percent porosity and 3.2 millidarcies.

So that given interval across this part of the SDX acreage position, you've got a sealed, tight cap on it with that supra-tidal environment, and this lower tight environment below the interval, so it sets up for a fairly effective potential waterflood interval.

Q. And I think you've summarized it pretty well right now, but after you've reviewed the geology in this area, what geologic conclusions do you have for this project?

A. Well, we think it sets up, based upon the stratigraphy and the structure, that this will be a fairly effective waterflood and increase recovery with a minimum

of additional infill drilling, but utilizing a waterflood operation.

Q. Mr. Jordan, were Exhibits 1 through 3 either prepared by you or under your supervision?

A. Yes.

MS. MUNDS-DRY: Mr. Examiner, we would ask that Exhibits 1 through 3 be admitted into evidence.

EXAMINER JONES: Exhibits 1 through 3 will be admitted to evidence.

MS. MUNDS-DRY: And I have no further questions for Mr. Jordan.

EXAMINATION

BY EXAMINER JONES:

Q. Mr. Jordan, these two thin sections of the pay interval, they're just different views or something?

A. Yes, just different magnifications.

Q. Okay, magnifications. And --

A. It's much prettier under the larger one.

Q. Yeah. Looks pretty tight, looks -- Only 9 percent. This was measured nitrogen porosity, is that what that was, the core porosity?

A. But it's done on the little sidewall, so --

Q. The sidewall.

A. Yeah.

Q. And how does that correspond to the log porosity

that you've got?

A. It's actually -- the core measures out a little higher than what we see -- what you'd give it on log. It's --

Q. How do you explain that?

A. Well, the log porosity reading about 6, 7, this is, you know, 2 percent either way --

Q. That's --

A. -- it's -- yeah, it's pretty much.

Q. Yeah. And these -- the fossils that you can see, they're just the ones that weren't dolomitized totally or something?

A. Right, they weren't -- You know, you get into brachiopods and you'll -- sometimes even out here, you'll see sponge remnants and whatnot. Deeper water, less reworking, so you've got some of that evident. When we start seeing the larger fossil fragments, we're assuming we're a little more subtidal.

Q. As a geologist, looking at these logs and these cores and the overall geology, how do you determine this is a good waterflood candidate?

A. Well, when we take a -- we've actually taken a couple of sidewalls up in that upper stuff, just to demonstrate to ourselves how tight it is.

Q. Okay.

A. There is no measurable log porosity above this interval. And below it we see a -- you know, distinctive facies changes indicated on the thin-section micrographs.

So given the fact that we're looking at, you know, up to 5 millidarcies, for the San Andres that's pretty good.

Q. Yeah.

A. So -- and it has worked in the area on trend in the same interval.

Q. What kind of -- would that on a geometric-average basis or a log-normal median or something -- is there a statistical average for that permeability and porosity numbers? Did you look at those, or --

A. We've tried plotting them on several reports. It kind of bounces around, but it's -- you know, I'd hate to hang my hat on anything on the San Andres as far as -- you know, if I've got 7-percent porosity, I'm going to have 2.3 millidarcy, I don't think it --

Q. So you -- there's no correlation between the porosity and the perm?

A. Well, yeah, the higher the porosity, usually the more connected and the better the perm becomes. But every once in a while you will see a situation where you've just got, you know, dissolved vugs, and where it's not. So there's where I get a little hesitant to --

Q. Yeah.

A. -- go push that too far.

Q. After looking at this, what kind of completions would you say would optimum here? I mean, acid job -- big acid jobs, or big frac jobs, or what?

A. Since I came with the fellow who did the completions, let me state -- start out with an acid job and then go into a frac.

Q. Fracs were necessary?

A. Yes, absolutely.

Q. And the -- what about this tombstone below and above? Is this fractured?

A. No.

Q. Did you say something about --

A. There -- you'll see some healed fractures on -- I believe you're referring to that one photo. You'll see some, very micro. But it's more related to the re-dolomitization. Above it, no. Below it, not really.

Q. So you think this water injection would be contained in the injection interval?

A. Absolutely, yes.

Q. And how does this area relate to other areas that you looked at in the general vicinity with the San Andres?

A. This middle -- or as we've designated, lower, middle and upper-lower, but this interval extends from

Atoka to -- a township and a half to the west-southwest, and extends for another two townships all over the edge of the Burch-Keely, I believe, is the area, which would be two townships to the east. You contract these zones.

Now there is a little bit of movement up and down as to how thick the upper San Andres is, but following that middle porosity unit, you can trace for approximately four townships.

Q. Okay, so is there other waterfloods that --

A. Yes, there are.

Q. -- would be similar to this as far as rock characteristics?

A. Yes.

MS. MUNDS-DRY: And Mr. Examiner, Mr. Morgan, who we're going to call next, is prepared to discuss some of the other waterfloods in this area.

EXAMINER JONES: Okay.

Q. (By Examiner Jones) Okay, the -- What about these Premier sands and the Lovington sand up above it? Is that owned by SDX, and is that production zone or --

A. Yes, and yes.

Q. Okay.

A. There has been Premier production. In fact, there's Premier unit that the -- wait a minute, I'm trying to track this down. The Artesia unit, north Artesia unit,

I believe, is the Premier unit.

Q. So these are actually waterflooded, these sands?

A. Above, yes. But those wells were not even drilled into this section. This play is more a function of the mid-'90s on. Typically, you'd have wells drilled either just toeing into the San Andres, or just into the Lovington --

Q. Okay.

A. -- at that depth.

Q. So they were just targeting the Grayburg?

A. Yes.

Q. And now you're targeting the San Andres. But you're not -- I guess Mr. Morgan would tell me more about the commingling. You don't intend to do any commingling here between the Grayburg and the San Andres?

A. In this project, no.

Q. Oh.

A. No.

Q. Okay, what about -- what about trap here, as far as -- you say it's kind of a stratigraphic-type confinement. What about areally? Is there -- You probably just told me. Is -- that it's kind of --

A. Well, normally the San Andres reservoir is -- the breadth of the trap is probably four miles, five miles. But with this ridge that runs from Artesia, sort of south

of Artesia all the way over to Vacuum, you actually are sitting out in front of what normally would be the shelf, and you compact it into this sort of false ridge out there, false shelf, if you will.

So you have compacted one mile, one and a half mile breadth of that reservoir --

Q. Okay.

A. -- stratigraphic trap caused by that structural ridge underneath it.

Q. There's a ridge under -- it's in the Glorieta or something, or in the Abo?

A. The Abo, yes.

Q. Is that a reef, Abo reef?

A. That's the Abo re- -- Empire-Abo is right here, so...

Q. Okay. And the San Andres that's so much better in the Vacuum field is -- you say it's on trend with this, but it's so much better because of more dolomitation or something, or -- In other words, why is this not -- this doesn't look like the porosity in the Vacuum field, you know --

A. Well --

Q. -- I mean --

A. -- I haven't worked the Vacuum. This particular reservoir was bypassed for years. I mean -- yeah, I

believe it just started being developed in the late '90s -- late '80s, over in this part. Over in the Atoka area, four townships to the west, it had been developed in the '40s.

Q. Okay.

A. But this had always been bypassed because it didn't look very good. But it certainly has produced well.

Q. Okay. Well, I noticed that the initial -- I guess these are IPs here --

A. Yes.

Q. -- here on the bottom?

A. Yes.

Q. They're pretty decent. Water production is pretty good up there, but -- is that -- Did you look at the water analysis or anything, or is that typical San Andres water or --

A. Yes.

Q. Okay.

A. Yeah.

Q. And the -- If you were going to pick just one little zone on any of these logs that you could get pure oil and gas, could you do that and get away from the water at all?

A. I don't -- I -- in fact, I don't think -- you're better -- You want water with the San Andres. I mean, you're going to get better production if you get in some

water, because you've got some permeability at that point.

Q. Okay. So it's kind of a -- it's always kind of in a gradational --

A. Yes.

Q. -- contact?

A. Yes.

Q. And as far as the variation areally within the proposed area to be -- Obviously we're not unitizing anything here today, right? We're --

MS. MUNDS-DRY: No.

EXAMINER JONES: -- proposing a waterflood on a lease?

MS. MUNDS-DRY: Yes.

EXAMINER JONES: Just a lease.

MS. MUNDS-DRY: Right.

Q. (By Examiner Jones) Okay. Across this lease, which areas are better and which areas are worse? Or are they all the same, pretty much?

A. Well, I'd have to say the wells up in the northeast corner, which is where we initiated the program, probably have been the best.

Q. Up in Section 29 and 32?

A. No, no, in 32.

Q. Okay. The best, meaning less water, more porosity -- ?

A. They've produced more so far.
Q. Okay.
A. But they -- pretty much, they look very similar.
EXAMINER JONES: What do you -- I guess -- okay, that -- That's all I have.
David, do you have questions for Mr. Jordan?
MR. BROOKS: I guess not. I'll hear what the next witness testifies.
EXAMINER JONES: Okay, thanks very much.
Should we leave these exhibits out?
MS. MUNDS-DRY: I don't think we'll need them.
EXAMINER JONES: No more geology?
MS. MUNDS-DRY: No geology. We're going to transition to some engineering.
EXAMINER JONES: Okay. Okay, am I correct to assume you're asking for this injection well to be released as a saltwater disposal well, or as an injector in a waterflood?
MS. MUNDS-DRY: Let's ask Mr. Morgan that question --
EXAMINER JONES: Okay.
MS. MUNDS-DRY: -- so I don't have to guess.
EXAMINER JONES: Okay.
MS. MUNDS-DRY: And Mr. Examiner, if you're ready I'd like to call Chuck Morgan.

CHARLES M. MORGAN,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. MUNDS-DRY:

Q. Good morning. Would you please state your full name for the record?

A. It's Charles Martin Morgan.

Q. And where do you reside?

A. In Midland, Texas.

Q. And by whom are you employed?

A. By SDX Resources.

Q. And have you testified before the Oil Conservation Division?

A. Yes, I have.

Q. And at the time were your credentials made a matter of record?

A. Yes, they were.

Q. And have you -- are you familiar with the Application filed in this case?

A. Yes, ma'am, I am.

Q. And have you made an engineering study of the area?

A. Yes, I have.

Q. And are you prepared to share the results of your

work with the Examiner?

A. Pardon?

Q. Are you prepared to share the results of your work with the Examiner?

A. Yes, I am.

MS. MUNDS-DRY: We would tender Mr. Morgan as an expert petroleum engineer.

EXAMINER JONES: Mr. Morgan is qualified as an expert petroleum engineer.

Q. (By Ms. Munds-Dry) Mr. Morgan, what is the status of the land on which the well will be drilled? And I'll ask you to refer to Tab 1, which has been marked Exhibit Number 4.

A. It's primarily state -- well, it is all state lands, as far as the minerals are concerned, and it is fee surface.

Q. And on this Exhibit Number 4, what does the yellow boundary show us?

A. The yellow is the boundaries of what we call the NW State Lease.

Q. And does SDX Resources have all the necessary rights to use the lands for this project?

A. Yes, we do.

Q. And if you would please turn to the next page, refer to those plats and identify what these are for the

Examiner.

A. The next page is a two-mile area of review around the first proposed injection well. I'll take a moment here to address Will's question on whether or not we wanted this as a saltwater disposal well or -- We want it as an injection well in the waterflood.

EXAMINER JONES: Okay.

Q. (By Ms. Munds-Dry) Thank you for answering that before I forgot.

A. Okay. Did I get ahead of you?

Q. And what's the next page?

A. The next one is a half-mile area of review around the first injection well, which is the NW State Number 8.

Q. And the next page?

A. The next page is a copy of the notification of the offset operators and the surface owner that were notified for the waterflood Application and for the C-108 on the NW Number 8 injection well.

Q. And if I can ask you to flip back to Tab Number 6, identify what Exhibit Number 6 is for Mr. Jones.

A. Exhibit Number 6 is a letter that we presented to Marbob and to Johnny Gray, who is the fee surface owner, telling him what our plans were. And he acknowledges in this letter that he has no objections to our use of the surface for our waterflood operations.

Q. And did we receive any objections from any of the offset operators that we've identified in our list back at Tab Number 1?

A. No, I did not.

Q. And what is the next -- Let's just briefly identify this for the Examiner. What's the next document here behind Tab Number 1?

A. Okay, behind Tab Number 1? You're looking at a list of all of the wells in the half-mile area of review around the NW Number 8.

Q. How many wells are in that area of review? Do you recall?

A. Let's see, about 45.

Q. And how many are in the injection interval?

A. Twenty.

Q. And then the next set of documents behind the C-108 well data sheet?

A. That is a summary of all of SDX's wells in the NW lease and their completion intervals and the type of completions that was done on them.

Q. So this provides a summary for the Examiner?

A. Yes, ma'am.

Q. Mr. Morgan, would you please turn to Tab Number 2, which is marked as Exhibit Number 5, and review that for the Examiner?

A. This is just a summary of the proposed waterflood project, basically stating that there are 560 acres in this NW lease in which SDX has drilled 20 wells that were completed in the middle San Andres. It goes into -- our EUR for the lease is expected to be close to 1 million barrels. Current decline rate is 12 to 14 percent. Estimated recovery factor on primary is going to be 10 percent. And our original oil in place is over 10 million barrels.

There is also some more reservoir engineering going into what we expect our secondary recovery effort to yield, which is about a 1-to-1 ratio, secondary to primary.

Q. And I believe you've also identified the first injection well --

A. Yes, I have.

Q. -- on the summary?

A. The NW Number 8 well is identified there, and its EUR 32,000 barrels, and its original oil in place, 327,000.

Q. Mr. Morgan, if you go another page back, this also gives your annual cash-flow report?

A. Yes. There's a reservoir engineering study on the NW Number 8 by itself, which includes cash flow report. Behind that, there's decline curves demonstrating the 12-percent decline. And I went on further to include a cash-flow report on the entire lease, all 20 wells.

There is a summary lease report which, in the Power Tools program, summarizes each individual well. I believe that's the third page back of the engineering work. And what that does is summarize each individual well and adds them all together. And if you'll notice as you go along, when wells become uneconomic they drop out. And there's a decline curve behind that.

The next part of that is what Power Tools does, is create a summary lease, and it just summarizes everything and treats it as one well. So you'll notice it carries 20 wells throughout. It doesn't drop any out, because the project does not become uneconomic. What I'm demonstrating there is the EUR of the lease.

Down in the lower right-hand portion of these cash flow summaries, you'll notice the ultimate gross, and that's the EUR -- anticipated EUR for the lease in oil and gas.

Q. Thank you, Mr. Morgan. If you'd please turn to Tab Number 3, what's been marked Exhibit Number 7, and identify that for Mr. Jones.

A. This is the C-108 that was previously submitted on the NW State Number 8 well.

Q. And is this Application complete?

A. Yes, it is.

Q. And have you reviewed this proposed project

previously with the OCD?

A. Yes, I've spoken with Will before on it.

Q. When did SDX first file this Application? Do you recall?

A. I believe it was filed in April, April 16th.

Q. And I believe that I indicated before to Mr. Jones that part of this Application is being processed administratively --

A. Yes.

Q. -- for the initial injection well?

A. That's correct.

Q. And is this the creation of a new project?

A. Yes, it is. I would like to address at this time, if that's all right with you -- Let me see which tab this is.

Q. Tab Number 4.

A. Yes, ma'am, Tab Number 4. The first part of Tab Number 4 is an offset waterflood that BP is putting in, in Section 33, which is basically, you know, one section away.

Skipping past that, there is a map behind that BP Application. SDX currently operates a waterflood directly above our NW lease. I'm going to take a moment here and try to clarify some confusion that will probably be created.

There is an old waterflood unit right above the

NW lease. It's called the northwest Artesia unit. And there's a map directly behind that BP application that has the northwest Artesia unit boundaries outlined in yellow. It also has all of the northwest Artesia unit wells, including their injection wells, spotted, and the NW State wells are also spotted on there.

The reason I'm bringing this to your attention, directly behind that map is an R order, R-4727, which was granted when this was unitized as a waterflood. This waterflood flooded primarily the Grayburg, actually the Premier sand, basically. It did not waterflood the San Andres, and most all of those wells were not drilled to the San Andres.

Q. Do you know why that was, Mr. Morgan?

A. No, I'm sure at that time they were just after the Premier sand which was, you know, a good waterflood project.

In this R order, the language, they did mention that they were going to inject, in the order, into the Grayburg-San Andres formation. That's why I'm bringing this out right now, because I didn't want to create confusion later on.

Q. And SDX is the operator now of this waterflood?

A. Yes, ma'am, we are. This waterflood is also in its later stages of life. We will be gradually phasing it

out.

You mentioned earlier, Mr. Jones, about unitizing. At this time we're not going to pursue that. The royalty owners and everybody in this area -- there's a million of them. It would take probably a couple of years to put a unit together right here, or even to extend the boundaries of the northwest Artesia unit. It's a very mature area, and the mineral owners are numerous and hard to find.

Q. And if you could turn back to Tab 3, and we'll go back to our review of the C-108 --

A. Okay.

Q. -- if you'll flip to the wellbore sketches here and review those for the Examiner. I believe it's the --

A. Okay.

Q. -- one, two -- the third --

A. The third page --

Q. -- third page.

A. -- is the wellbore schematic of the NW State Number 8. The well was drilled to 3300 feet. Our primary target was the -- what we call the middle San Andres perforations from 2523 to 2859. All of the wells in this are that SDX drilled in the NW lease were similar to this depth. Cement was circulated on both the surface and on the long string on all of the wells that we drilled, and

they're all pretty similar to this.

What we propose to do is set a packer approximately 75 to 100 feet above the existing perfs and inject through plastic-coated tubing.

The next wellbore diagram is the anticipated condition of the first injection well.

Q. And what water injection volumes does SDX propose?

A. We're proposing to inject 500 barrels a day into this well. I imagine after fill-up that will be quite a bit less, probably around 300.

Q. And will the system be open or closed?

A. It will be closed.

Q. And will you be injecting under pressure?

A. Yes, we will.

Q. What's your proposed average injection pressure?

A. The average injection pressure will be less than 500 pounds.

Q. And if a higher pressure is needed, will SDX justify the higher pressure amount by a Division-witnessed step rate test?

A. Yes.

Q. And are there plugged and abandoned wells in the area of review?

A. Yes, there are.

Q. If you will please turn to the next page and review that for the Examiner?

A. The next page is a schematic of the Aspen 32 State C Number 1, which is a plugged well within the half-mile area of review.

Q. And this is the only well that exists within the half-mile area of review --

A. It's the only plugged well in the half-mile area of review that penetrated the injection zone.

Q. And have you reviewed the data available on this well within -- and other wells within the area of review for this waterflood project and satisfied yourself that there's no remedial work required on any of the wells to enable SDX to safely operate this project?

A. Yes.

Q. And if you would please turn to the next page and describe the formation water in the proposed injection zone?

A. The formation water that will be injected is primarily produced San Andres water from the same formation, ranging in chlorides from 160,000 to 180,000. We have no plans to inject any fresh water.

Q. And this report shows the -- this is the water analysis done for the area?

A. Yes.

Q. And are there any freshwater zones in the area?

A. There are limited zones of fresh water within the area. BP actually identified a freshwater well in their waterflood project that I believe is further than a mile away. It's going to be real close to being within a mile, but I think it's outside the mile.

Q. And I believe that's in Section 33?

A. Yes.

Q. In your opinion --

A. There are --

Q. I'm sorry.

A. There are no freshwater wells that I know of in Section 32.

Q. In your opinion, will the injection of waters proposed by SDX pose a threat to any freshwater supplies in the area?

A. No.

Q. And have you examined the available geologic and engineering data on this reservoir, and as a result of that examination have you found any evidence of open faults or other hydrologic connections?

A. No, I have not.

Q. And I believe you've mentioned this, but in case you want to -- I think we should go back to Tab Number 4 and discuss the -- you were discussing the active

waterflood in the Grayburg. If you'll turn back to Tab Number 4 --

A. Okay.

Q. -- and identify, just -- if you'll discuss the BP project for Mr. Jones.

A. All right, the first several pages behind Tab 4 is the order that was issued for BP's waterflood in Section 32. It's their Washington 33 waterflood project. They're proposing to waterflood the Queen, Grayburg and San Andres intervals.

Q. And if you would then please turn to Tab Number 5 and identify Exhibit Number 9 for the Examiner.

A. Behind Tab Number 5 is just a brief summary of what we consider to be an analog waterflood. It's the Atoka-San Andres unit located in Sections 10 through 15 of 18-26. And this was one of the few waterfloods where just the middle San Andres was waterflooded. And I included a little bit of reservoir work on that to show the type of recovery that they were able to achieve with their waterflood.

Q. Where is this waterflood in relation to SDX's proposed project?

A. It's probably about ten miles east of us, and a little bit south -- excuse me, west. It's about ten miles west of us and a little bit south.

Q. And the second page, what does this show?

A. The second page is a cum curve, just showing the cums of the San Andres unit, Atoka-San Andres unit. Behind that I have an actual decline curve. The Atoka-San Andres unit was unitized, I believe, in '68, and active flooding started in about 1970, which is pretty convenient because that's basically when all of your production data is available on the computer programs, so I've included the decline curve.

If you'll notice, during the height they were able to cut their decline rate down to about percent, and towards the end they -- in 1990 they had some interruptions in their injection. I don't know if they were -- had some mechanical problems or why they ceased injection, but their decline rate kicked back up to about 5 percent at that time.

The next page is another decline curve with an injection curve on it.

Q. And did you expect similar results from this Atoka-San Andres unit to the SDX-proposed project?

A. Yes, we did.

Q. Or perhaps better?

A. Hopefully better, yes, ma'am.

Q. Great. If you could turn to Tab Number 6, second page, is Exhibit Number 10 an affidavit of notice

indicating that notice was given in accordance with Division Rules, as well as two affidavit of publications and the notice letter and the return receipt green cards that were sent to all offsets and the surface owner?

A. Yes.

Q. And did SDX also give notice of this Application when it first submitted this Application to the Division?

A. Yes, we have a copy of that in here where we did notice the surface owner and the offset operators. And after conversation with Mr. Jones we did resubmit that, because we had used an old address.

MS. MUNDS-DRY: And Mr. Jones, you'll notice there's two affidavit of publications. The legal notice was published again to provide some corrected information.

EXAMINER JONES: Okay.

Q. (By Ms. Munds-Dry) Will approval of this Application be in the best interests of conservation, the protection of correlative rights and the prevention of waste?

A. Yes.

Q. And were SDX Exhibits 4 through 10 either prepared by you or compiled under your direction or supervision?

A. Yes, they were.

MS. MUNDS-DRY: We would move the admission of

Exhibits 4 through 10 into evidence.

EXAMINER JONES: Exhibits 4 through 10 will be admitted.

MS. MUNDS-DRY: And I have no further questions for Mr. Morgan.

EXAMINATION

BY EXAMINER JONES:

Q. Okay. Mr. Morgan, the State Land Office, what did they say about this?

A. I have not talked to them yet.

Q. Are they -- but they're your only royalty owner; is that right?

A. As far -- No, there are other -- there other royalty owners in the lease.

Q. But -- Okay. So it's not all state lands, then, there's some other --

A. Are we talking about overriding royalties or royalty interests? I'm --

Q. Well, I'm no landman, but I --

A. These are all State leases. There are no fee leases in here, so the State is the only royalty owner.

Q. Okay. And where are all these leases? I mean, which -- Is there different tracts?

A. This is all one lease.

Q. Okay, it's all one lease?

A. Yes, sir.
Q. And it's a state lease, it's all one lease --
A. Yes.
Q. -- but there's some overriding royalty interest owners?
A. Yes, that's correct.
Q. Okay, and Johnny Gray personally owns all the surface here?
A. Yes.
Q. Not Marbob, Johnny Ray?
A. Johnny -- or John R. Gray, LLC.
Q. John R. Gray, LLC.
A. Yes, sir.
Q. I think I've heard of him.
But tell me about the northwest part of Section 32.
A. I have to look at that map again under Tab --
Q. It looks like -- Do you guys have a landman on staff, or are you the landman also?
A. We use contract landmen when we need to. Otherwise, we do it ourselves. You want to know about the northwest part?
Q. Of Section 32.
A. Okay.
Q. Is that -- one operator owns that, as far in the

middle San Andres?

A. Yes.

Q. Who is that?

A. That would be SDX.

Q. Oh, you guys -- you guys own that, northwest of Section 32?

A. Oh, okay, I see what you're talking about. There are two 40-acre tracts, which would be the south half of the northwest quarter. Is that what you're looking at?

Q. Okay, just the whole quarter --

A. The north half of that quarter is owned by SDX.

Q. Okay.

A. If you notice --

Q. I did, I saw something about --

A. -- the Enron State Number 1 and Number 2 wells, those are owned and operated by SDX.

Q. Okay.

A. Below that, Marbob, BP and several other people own the south half.

Q. So it's basically Marbob, BP and other people?

A. I think there's several other people.

Q. As far as the controlling interests go?

A. Yes.

Q. Well, how do you -- What is the current well spacing for production wells out here?

A. The current well spacing is 40-acre spacing. We have done some infill drilling, with mixed results.

Q. Okay. Okay, so that -- the Northwest State Number 8, that's just converting one of the 40-acre wells; is that right?

A. That's correct.

Q. So you'd have an 80-acre inverted fivespot pattern; is that right?

A. Basically. We have future plans to convert the Number 5 also. We'd like to see how the formation responds.

Q. So basically this is -- starting out with one well, you're just testing to see what's the direction of permeability and --

A. I would consider this a pilot, yes, sir.

Q. So you don't know for sure if you want to drill 20-acre spacing, 40-acre fivespots yet.

A. That's correct.

Q. Okay.

A. If you'll notice up in the northeast corner of Section 32, we have done some infill drilling.

Q. Okay.

A. Mixed results.

Q. Okay. But Mr. Jordan said he thought that area was the best area?

A. Yes.

Q. Okay. So this well, you expect the -- this well could possibly get your production rate back up to the initial production rate on the surrounding wells?

A. I would hope that it would, yes. And at best it would alter our current decline rate. Twelve to 14 percent is pretty steep. If we could arrest that down to 3 percent, similar to what you saw in the Atoka-San Andres Unit, we would be pleased with that.

Q. Okay. The wells that you would convert, would they all be on the interior of the unit, or would you propose any on the exterior of these -- of this lease, to --

A. They would --

Q. -- confine the injection, for instance?

A. I would say they would be primarily on the interior. BP is currently putting in injectors in 33 on that side of us, which would be the east side, and I'm hoping that will take care of everything over there.

Q. Yeah.

A. This would be more of an extension.

Q. Yeah. Except the Premier and those other Grayburg sands are a part of another waterflood; is that right?

A. That's correct.

Q. Did you say that?
A. Yes.
Q. Okay. And that's the northwest Artesia unit?
A. That's the northwest Artesia unit. If you look at the tab -- Where was that tab? It's in 3, isn't it?
Q. Or --
MS. MUNDS-DRY: Four, in the middle of those orders, maybe?
THE WITNESS: Yes, ma'am.
EXAMINER JONES: Okay.
THE WITNESS: In the middle of 4. If you'll compare that map to the map in Tab 1, you'll notice that the NWA unit sits right above us, but it's not exactly the same shape and size --
EXAMINER JONES: Okay.
THE WITNESS: -- but it's pretty similar. And that was put in, I believe -- Depco put that in. Harold Kersey later operated it, and we bought it from Kersey's heirs.
Q. (By Examiner Jones) So you guys operate that?
A. Yes.
Q. And it's -- so -- and it's got a kind of a hole in it for the northwest of the southeast; is that right? That Jeffers Number 1?
A. Jeffers Number 1, yes. Mr. Jeffers held that 40

out of the unit. It is not in the unit.

Q. But he's got a production well there?

A. Yes, he does. And we also own the San Andres rights. His production well is strictly to the Premier. We have -- The Jeffers Number 1 on this map is an SDX San Andres producer.

Q. Okay.

A. And it's part of our NW lease.

Q. Okay. And this unit also excludes that Marbob-, BP- and others-operated northwest of Section 32?

A. Yes, the south half of the northwest quarter.

Q. Okay. What's the well -- These triangles are the injection wells on this one?

A. On this one, the three triangles are the injection wells currently active --

Q. Three --

A. -- in the northwest Artesia unit.

Q. Okay. And there is no injection wells over to the west of there, is there? I don't see any west of that.

A. There -- At one time there were --

Q. Okay.

A. -- but they're now inactive. Most of them have been converted to producers.

Q. Okay. Now what do you see as the primary reason for forming a waterflood unit here, besides just in the

area that you're going to waterflood? I mean, why would you want to include those other areas? Just because they're part of the lease, is that the deal? Like down in Section 6, that -- I guess you don't want to split a lease, is that --

A. Down in Section 6 is part of the NW lease, and we have middle San Andres producers there. We just want to include it in the waterflood.

Q. Do you think you'll ever waterflood it down there? And how would you, if you do?

A. Well, you -- you know, you might get a response from one of your injectors that close.

Q. I do like the fact that you're confining your production to one zone instead of doing the BP push, you know, on all those zones.

A. Yes, sir, that's one of the reasons I included the completion summary in there, where you can see that all of these wells are perforated in about a 400- to 500-foot interval that we call the middle San Andres.

Q. Okay, 400 to 500 feet --

A. Interval.

Q. It's not 1500 feet, like some of the --

A. The entire San Andres interval is that thick, 1500 feet or so, but the interval that we've confined our perfs to is 400 to 500 feet. That's the -- There's kind of

a porosity streak through the middle. It's about 500 foot down into the San Andres, and then there's probably 500 feet below us that's pretty tight.

Q. Yeah. What direction do you think your water's going to go? I'll keep hammering engineering questions here, I guess.

A. Well, I would anticipate that it would probably go west, go updip.

Q. Okay, okay. And you've put down saltwater saturation at 40 percent. What would be your -- Is that your current saturation, or is that your irreducible?

A. That's log-calculation SWs.

Q. That's the current?

A. Yes, sir. And production runs out there anywhere from 40 to 60 percent. So it actually calculates pretty close.

EXAMINER JONES: Okay, I think there's a whole lot of land questions here that I am not asking, and they probably -- Maybe I'll punt this over to David here.

MR. BROOKS: Well, thank you.

I guess I'll start out with the notice issues -- the notice question. Let's see, which tab was the notice information behind?

MS. MUNDS-DRY: Tab 6, Mr. Brooks.

MR. BROOKS: Thank you.

EXAMINATION

BY MR. BROOKS:

Q. Okay, this is the list of the people to whom you gave notice, correct?

A. That we did notify?

Q. Yes.

A. Yes, sir.

Q. This is -- I'm looking at the list that's on the page behind the publication affidavit.

Okay, let's see. We talked about the owners of -- we talked about the south half of 32 --

A. Yes.

Q. -- BP and Marbob and others you mentioned. Now are there existing San Andres wells on that --

A. No, sir, there are no wells.

Q. Okay. So then if there are other working interest owners, how come you didn't notify them, if there's not an operated well on that -- San Andres well in that area?

A. I'm assuming that that's a pretty complex land issue right there.

Q. These others, though, they're also working interest owners. You're not talking about royalty owners?

A. That's correct.

Q. Okay.

A. And I would hope that our public notice would take care of that for us.

Q. Okay, you move up to Section 29 to the north. Who has the lese on that?

A. The -- If my memory serves me right, we have the lease in the southwest quarter of 29.

Q. Southwest would be SDX.

A. Yes, sir. And I am not certain, but I believe that the 40-acre tract, which would be the southwest of the southeast right there, I think that is operated by Edge. I'm not certain.

Q. Okay. And everything else in 29 -- in the south half of 29 would be SDX?

A. Yes, sir.

Q. Okay. Then we go over to -- I guess it's 28 that's in the corner there, in the angle there?

A. Yes.

Q. In the south -- No, that's 29. Oh, oh, no, I see, it's 29 all the way across here. Now -- but the edge, is that in the -- Where is that? You said -- you told me, but I didn't get it down. What --

A. I was talking about this 40-acre tract, which would be located right here, which is the southwest of the southeast of 29.

Q. Southwest of the southeast.

A. I believe that's correct.
Q. You didn't notify them?
A. No, we did not.
Q. Okay. And then BP, you said, had the acreage in 33?
A. Yes, that's correct.
Q. And who's the owner up in 28? The southwest corner of 28 -- yeah, the southwest corner of 28?
EXAMINER JONES: I think it's Marbob.
THE WITNESS: I believe you're right, it looks like Marbob on the map.
Q. (By Mr. Brooks) Marbob, okay. Now then, going down here into 32, this Jeffers well, that's -- SDX owns the San Andres rights in that well, you said?
A. Yes, sir, in -- yes, sir, that's correct.
Q. And you've got two SDX producers designated in the east half, so SDX owns also the east half?
A. Yes, that's correct.
Q. Okay. What about the southwest quarter of the southeast quarter?
A. We do not own that, and I do not know who does.
Q. And down in Section 5, who has the lease down there?
A. Looks like BP has a lot of it. The rights are stratified. I do not know who would own the shallow part

of it.

Q. Now I may sound ignorant with some of the questions I'm asking, but I'm not an engineer or a geologist, I'm just a lawyer, so probably a lot of things I don't know. You know, I'm asking for education as much as anything else.

When you inject water -- Well, first of all, let me establish -- I think I'm clear on this. The only injector you presently propose is the Number 8, correct?

A. That's correct.

Q. Do you have future plans to put in additional injection wells within this area?

A. We have future plans to put in one additional one at this time, which would be the Number 5.

Q. Okay.

A. It's indicated on this map.

Q. And that's all you plan to do?

A. Currently, yes, sir.

Q. Yeah. Now, you're asking for an order that would designate this entire lease as a waterflood project, correct?

A. That's correct.

Q. So that you -- and you understand that when you have a designated waterflood project, then you can add additional wells by administrative application and

procedure --

A. Yes, sir.

Q. -- right, and you don't have to have another hearing?

A. Yes, sir, that's correct.

Q. Okay. Now, how far -- when water is injected into the San Andres formation in the manner in which you plan to do in this unit, how far do you anticipate it to travel within the formation?

A. I would anticipate less than a half mile.

Q. Okay, and you have testified that the primary direction of movement is going to be west?

A. That's correct.

Q. And why would that be?

A. Because that's updip.

Q. Okay, and why does it move updip? I may be very naïve here, but can you give us some 101 explanation here?

A. That's just basically the way water behaves in the formation.

Q. Yeah, okay. And so if the water traveled into another -- or outside the boundaries of the waterflood project and into other ownership, what would the effect be? If there were other wells, I suppose it may increase the production from those wells --

A. Yes, sir.

Q. -- as well?

A. I'm assuming they would achieve some pressure maintenance.

Q. Yeah. But there aren't any wells in the south half of the northwest quarter, in the San Andres, correct?

A. Let me look at that on the map.

Q. I thought that's what you told me.

A. You're talking about Section 31?

Q. Yeah.

A. In the south half of -- That's correct.

Q. Okay. And the wells, of course, up in the north half are your wells, SDX wells?

A. That's correct.

MR. BROOKS: Okay, I guess that's all my questions.

FURTHER EXAMINATION

BY EXAMINER JONES:

Q. I think if we're going to do the waterflood here, we need to have a notice to the state land office --

A. Okay.

Q. -- and to the overriding royalty interest owners, of this lease.

MR. BROOKS: It looks like -- I have not checked the notice rule. It would seem to me that we need to have notice -- it would seem to me that the notice requirements

for adjacent leases may not have been entirely complied with, but I'd have to check the rule to see exactly what it requires.

Q. (By Examiner Jones) I think David's right on that. I was under the impression -- See, our Rule 701 has changed, and if there is no designated operator in that south -- let's see, the southwest of the southeast, for that -- for instance, that location, all the lessees should be noticed, so you have to do a land takeoff on that --

A. Okay.

Q. -- just for the injection well alone, and --

MR. BROOKS: And you'd also have to notify all the working interest owners in the south half of the northwest quarter, because --

EXAMINER JONES: Yeah.

MR. BROOKS: -- you don't have an operator there.

Q. (By Examiner Jones) Yeah. And I think one of the deals is, if you convert some of these wells that somebody might have no right in, that they don't have an override in the offset producer, you know, that kind of a thing --

A. Right.

Q. -- well, you might affect their correlative rights in that respect. And so to form the waterflood, we definitely need to notice everybody down through the

revenue interest level, so that includes the State Land Office and overriding royalties of this lease. And that -- So that's just the notice issue that we've got.

Otherwise, you know, the fact that this is kind of a -- ideally on a waterflood, as you know as an engineer, if you have a big area where you can concentrate wells and --

A. Yes, sir.

Q. -- and here you've got this -- you've got this lease that kind of goes in the northeast quarter and the northwest -- or the southwest quarter, so then you've got your northwest quarter and your southeast quarter missing. Maybe there's no way around that. But did you -- You said you didn't want to contact those people to try to include them in this project?

A. That wasn't what I mean to say. I just meant that we have not contacted --

Q. It would take two years, you said, something like that.

A. Well, as far as royalty owners, issues on some of that, it would take some time. We would hope our public notice in the paper would take care of a lot of that.

Q. As far as converting that Number 8, I think that one is pretty much ready to go as a saltwater disposal well --

A. All right.

Q. -- and you might get some benefit out of it one way or the other, but you still need to notice those people within a half mile, as in that Rule 701 is written, because it's been rewritten --

A. Okay.

Q. -- so --

MS. MUNDS-DRY: We can review that rule, Mr. Examiner. I was under the impression that it was leasehold operators within a half mile.

I didn't realize we needed to go down to that level, but we'll certainly --

EXAMINER JONES: It is leasehold, if there is leasehold operators in the middle San Andres.

MS. MUNDS-DRY: Okay.

THE WITNESS: We can re-notice and re-submit that to you at a future date.

MS. MUNDS-DRY: We would ask, then, if we could continue the case. I guess we would need four weeks --

EXAMINER JONES: Yeah.

MS. MUNDS-DRY: -- and then we can --

MR. BROOKS: I guess that -- I'm sorry.

EXAMINER JONES: Go ahead.

MR. BROOKS: I guess there's one other question I didn't ask you.

FURTHER EXAMINATION

BY MR. BROOKS:

Q. Because there's some undrilled tracts in here, what effect would the waterflood have on an undrilled tract? Now I understand if that's another tract that had a well on it, it might improve the production to that well, the same as it would the wells that are the target of it.

But what about the undrilled tract? Would it affect the productive prospects of somebody that wanted to drill on a tract -- adjacent tract that had not been drilled?

A. It could conceivably affect it, either through increasing the formation pressure or, worst-case scenario, it could sweep the production.

Q. Could cause it to move, to migrate?

A. Yes, sir. The distance from these two injectors in that San Andres, I don't anticipate that happening.

MR. BROOKS: Okay, thank you. That's all I have.

EXAMINER JONES: Okay.

MS. MUNDS-DRY: That concludes our presentation, Mr. Jones.

EXAMINER JONES: It's agreeable to continue it for four weeks?

MS. MUNDS-DRY: Yes, please.

EXAMINER JONES: So I think that's for July the

21st; is that right?

MR. BROOKS: Right.

EXAMINER JONES: Okay, we'll continue this case until -- June 21st.

MR. BROOKS: June 21st, you're right. I'm not thinking.

MS. MUNDS-DRY: And I was going to --

EXAMINER JONES: Unless you --

MS. MUNDS-DRY: -- believe you about --

EXAMINER JONES: want July.

MS. MUNDS-DRY: -- the July.

No, I'll be having a baby, hopefully, then.

EXAMINER JONES: Okay, we'll just -- we'll try to catch you right before that.

Okay, that's it for that one.

MR. BROOKS: Okay, how about a brief recess?

EXAMINER JONES: Let's take a brief recess until -- 15 minutes.

MR. BROOKS: Okay.

(Thereupon, these proceedings were concluded at 10:07 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ _____.

_____, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL May 28th, 2007.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2010