STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION

APPLICATION OF SOUTHERN UNION GAS SERVICES, LIMITED FOR APPROVAL OF AN ACID GAS INJECTION WELL, LEA COUNTY, NEW MEXICO

CASE NO. 14080

FEBRUARY 7, 2008

1220 South St. Francis
Santa Fe, New Mexico

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WITNESSES: ROBERT A. MILAM and ALBERTO A GUTIERREZ

EXHIBITS: 1 - 5

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EXAMINER EZEANYIM: Let's go back on the record and call Case No. 14080. And this is an application of Southern Union Gas Services, Limited for approval of an acid gas injection well, Lea County, New Mexico. Call for appearances.

MS. MUNDS-DRY: Good morning, Mr. Examiner. Ocean Munds-Dry with the law firm of Holland and Hart here representing Southern Union Gas Services, Limited. And I have two witnesses.

EXAMINER EZEANYIM: Those are your appearances? Okay, may the witnesses stand up, state your name and be sworn?

THE WITNESS: Robert A. Milam.

THE WITNESS: Albert A. Gutierrez.

[Both witnesses were sworn.]

MS. MUNDS-DRY: I'd like to call Mr. Milam first, please.

EXAMINER EZEANYIM: Okay.

ROBERT A. MILAM

after having been first duly sworn under oath, was questioned and testified as follows:

EXAMINATION

BY MS. MUNDS-DRY:

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

A. Robert A. Milam.

Q. And where do you reside?

A. In Keller, Texas.

Q. And by whom are you employed?

A. By Southern Union Gas Services, Limited.

Q. And what is your position with Southern Union?

A. I'm vice president, engineering, business development and environmental health and safety.

Q. And are you familiar with the application that's been filed in this case?

A. Yes, I am.

EXAMINER EZEANYIM: Please, can you spell your last name?

THE WITNESS: M-i-l-a-m.

Q. (By Ms. Munds-Dry): Now, your application concerns the oil and gas operations in the Jal No. 3 area.

A. Yes. Southern Union operates the Jal 3 plant in the area where the acid gas injection well is proposed.

MS. MUNDS-DRY: And, Mr. Examiner, we're not offering him as an expert. He's simply here to give you an overview of what Southern Union Gas Services does, who they are, and provide you with a pre-overview of this application.

EXAMINER EZEANYIM: Okay.

Q. (By Ms. Munds-Dry): Mr. Milam, would you please provide the examiner with an overview of what Southern Union and, in particular it's operations in New Mexico, does?

A. Certainly. Southern Union Gas is a midstream

gatherer and processer with treating facilities in the Permian Basin. We operate approximately 4800 miles of low-pressure and high-pressure gathering pipeline. We operate four cryogenic processing plants with treaters and an additional two other treaters in the Permian Basin in west Texas and New Mexico. More specifically, in New Mexico, we operate approximately 2000 miles of gathering pipeline and the Jal 3 plant. The Jal 3 plant is a 90-million-a-day cryo plant with treating facilities and an existing sulfur recovery unit.

Q. And how long has Southern Union Gas Services been operating in New Mexico?

A. Thank you. Southern Union acquired Sid Richardson in March of 2006, a name you're probably more familiar with. And Southern Union has -- the name, Southern Union, has been here since March of 2006. Sid Richardson has operated these facilities since 1990.

Q. And do you have other employees from Southern Union here with you today?

A. Yes, we do.

Q. Would you introduce them?

A. We have our director of engineering, Curtis Clark, our director of environmental health and safety, Herb Harlass, and the project engineer on this project, Ross Boyd.

Q. Thank you. If you could, please tell Mr. Ezeanyim, why has Southern Union proposed this project?

A. What we've found is we're in the process of needing to expand our treating capacity at Jal. We have seen CO2 levels of the currently produced gas and new drill gas, the CO2 levels are increasing and have reached the capacity of our treater at Jal 2. We are needing to expand that. This takes that acid gas stream and handles it for us.

Q. And can you please give the Examiner an idea of, and in your talks with other operators and other industry-related members, the importance of this project to them?

A. Well, our producers -- we currently are at our treating limit at our Jal plant. And two very active producers, New Mexico producers in this area, Apache and Range, they have both curtailed their drilling plans trying to wait on treating capacity to occur. And so we, by expanding our treating capabilities, we will not only help them, we'll also help with some of the plant upsets that we've seen over the last year of going sour at the plant.

Q. And if this application were not granted, what would Southern Union's alternative be?

A. We would have to -- we would have to build and permit a sulfur recovery unit and would end up venting the CO2 into the atmosphere in that time period instead of sequestering the CO2.

Q. So this application would help you better comply

with air regulation as well?

A. It's a very environmental-friendly project. We're proposing this with electric horsepower and also sequestering the CO2 and acid gas.

Q. And why would the granting of this application be good for the state of New Mexico?

A. Again, I think it's a very friendly environmental project. I think number one, by sequestering CO2, I think would be the number one benefit for the state of New Mexico. In addition, it will allow more throughput from existing producers in the area, which obviously benefits them and their cash flows and their tax revenues and, in addition, to interest owners and royalty owners.

Q. And who did Southern Union retain to prepare the C-108 application?

A. We retained Geolex, Inc. with its principal, Alberto Gutierrez.

Q. And will Southern Union call Mr. Gutierrez to review this C-108 application?

A. Yes, we will.

Q. And is there also an engineer, I believe you introduced him, from Southern Union who is present here today in case the Division has any questions that are within his expertise?

A. Yes, there is. And that's Ross Boyd.

MS. MUNDS-DRY: I have nothing further for Mr. Milam, Mr. Examiner.

EXAMINER EZEANYIM: Okay. Thank you.

MR. BROOKS: No questions.

MS. MUNDS-DRY: Thank you, Mr. Milam.

EXAMINER EZEANYIM: Are you saying there is nothing like Sid Richardson anymore? Your boss is Sid Richardson?

THE WITNESS: We were Sid Richardson and Southern Union acquired the entire company of Sid Richardson a year and a half ago. I was with Sid Richardson, yes, sir.

EXAMINER EZEANYIM: Okay -- you were, okay. Because I had a long-standing deal with Sid Richardson. Okay.

Mr. Milam, your purpose of this application is because you are doing an expansion of Jal No. 3?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: It is Jal No. 3. So you are using the -- are you increasing the capacity of that plant? Is that what you are doing? For the capacity, you are going to increase the capacity and processing there?

THE WITNESS: We are increasing our treating capabilities and capacity at that plant with this project, yes, sir.

EXAMINER EZEANYIM: And you still have a sulfur capping unit there?

THE WITNESS: Yes, we do.

EXAMINER EZEANYIM: At present is that sulfur capping unit handing what you are doing currently?

THE WITNESS: It is handling what we're doing currently because we have production curtailed in the field.

EXAMINER EZEANYIM: Because you curtailed production. So that's why. I'm trying to understand this business of the application. So that's why you want to get those in the field and expand your capacity, then maybe get this AGI injection?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: And this is -- now, I know that you're not going to remember -- so what is the capacity of the current SRU?

THE WITNESS: 20 tons.

EXAMINER EZEANYIM: 20 tons. And you would like to go to 40 tons or how much? And they are for the 20 tons capacity?

THE WITNESS: With the acid gas injection, this should double our capacities for treating. And it's not just the SRU, it's the CO2 capability that they need.

EXAMINER EZEANYIM: CO2, too?

THE WITNESS: Yes, sir. The increased CO2 levels is what has run us out of treating capacity and caused some of the curtailments.

EXAMINER EZEANYIM: The rest of my questions can be answered by an engineer or somebody who is familiar with that.

But I definitely have an idea of the concepts of what you are doing. Thank you. You may be excused.

MS. MUNDS-DRY: Thank you, Mr. Milam. I'd like to call my next witness.

EXAMINER EZEANYIM: Go ahead.

ALBERTO A. GUTIERREZ

after having been first duly sworn under oath, was questioned and testified as follows:

EXAMINATION

BY MS. MUNDS-DRY:

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

A. Yes. Alberto A. Gutierrez.

Q. And where do you reside?

A. In Albuquerque.

Q. And how are you related to Southern Union?

A. I am a consultant and a contractor for Southern Union on a number of projects, but for this particular project for an AGI feasibility study and application.

Q. And what were you asked to do for them?

A. I was asked in August of last year to evaluate the feasibility of installing an acid gas injection well combined with a wastewater disposal well at the Jal 3 plant. The Jal 3 plant currently has a permitted -- and has for the past 20 years -- a permitted plant wastewater-disposal well.

And I was asked to evaluate the feasibility of adding acid gas injection first to that well and then, if not, to replace that well with a well that was adequate for disposal of both fluids.

Q. And have you previously testified before the Division?

A. Yes, I have.

Q. And were your credentials as a petroleum geologist and a hydrogeologist accepted and made a matter of record?

A. Yes, they have.

Q. And are you familiar with the application that has been filed in this case?

A. Yes, I prepared it.

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

A. I have.

MS. MUNDS-DRY: Mr. Examiner, we would tender Mr. Gutierrez as an expert in petroleum geology and hydrogeology.

EXAMINER EZEANYIM: I know you are certified.

THE WITNESS: Yes, I am.

EXAMINER EZEANYIM: You are so certified.

Q. (By Ms. Munds-Dry): Mr. Gutierrez, I believe you prepared a PowerPoint presentation to go along with our exhibits today.

A. I have. As we address the various issues, maybe I'll refer to different parts of that PowerPoint rather than just go on through the whole thing.

Q. Okay. Would you briefly state, then, what Southern Union Gas seeks in this application?

A. Yes. And as Mr. Milam mentioned, the CO2 content of the gas inlet stream to Jal 3 has been increasing. It's actually a pattern we've seen throughout southeast New Mexico with the gas production that the CO2 content in the gas has been increasing generally, and in some cases, has been the acid gas or the H2S content.

So what Southern Union is seeking to do is to find a method of being able to deal with this increased CO2 and acid gas, because the current capacity of the SRU is at its limits. And furthermore, I think, and equally importantly, the company is committed to trying to reduce the emissions of greenhouse gases on a total basis.

And right now, as you well know, the SRU separates out the sulfur from the H2S, but all of the CO2 goes right up the stack. So this alternative of acid gas injection takes the stream of combined CO2, roughly about 78 percent CO2 and about 20 percent H2S, and permanently sequesters it and eliminates not only the potential for upsets in the -- in a sulfur-reduction unit expansion, but also it sequesters the CO2 permanently.

Q. Thank you. Would you please identify and review what's been marked as Southern Union's Exhibit No. 1 for Mr. Ezeanyim?

A. Yes, Mr. Hearing Officer, the Exhibit 1 is the C-108 application for this proposed project. Having done four or five of these already for different companies here -- and frankly, it's been a learning experience both for us and for the Division, because there's really no separate rules for acid gas injection -- but hopefully we have put together this application in a format that is easy for you to follow and to find all the information that you need.

But just to call your attention to the application, after the title page, we have the two pages that are the actual C-108 form. And then the following pages, the table of contents for the application. And what we've done is --

EXAMINER EZEANYIM: Excuse me. Do you have labels on them, no? I think you have one -- you have these tabs, but there is no label on them.

MS. MUNDS-DRY: No. We did not label them for you.

THE WITNESS: Well, if you would like my copy, it is labeled.

EXAMINER EZEANYIM: So I have one that you have submitted?

THE WITNESS: Yes. It is the same one.

EXAMINER EZEANYIM: Because when you are talking,

then I know where you are.

THE WITNESS: Exactly.

EXAMINER EZEANYIM: I can go with you. Because this one is not labeled.

THE WITNESS: No. That's fine.

EXAMINER EZEANYIM: I get lost.

THE WITNESS: Here's the one that we submitted. That will be fine.

EXAMINER EZEANYIM: Now yours is not labeled.

THE WITNESS: That's okay. You're the one that has to follow this.

EXAMINER EZEANYIM: Now this is labeled. So where are you talking about? I'm sorry about that.

THE WITNESS: No problem. As I mentioned, behind the cover pages are two pages which are the actual form C-108. And we've done here, and then following that is a table of contents for the application. And all of the information, as you can see, is divided into seven sections in the table of contents. One is basically an executive summary; two, an introduction on how the application is organized; three, proposed construction and operation of the AGI well; four is the geologic and hydrogeologic investigation results; five is the discussion of all of the existing oil and gas wells in the vicinity; six deals with the issues of notification of operators and surface owners; and the seventh section is our affirmative statement

regarding the potential connection of proposed injection zone.

But what we've done is, in the application itself, the first two pages, we've cross-referenced each one of the questions in the C-108 application with the appropriate location in this document so that you can find exactly what information you're looking for in those individual sections. Because, obviously, the information is too voluminous to put on the form itself.

EXAMINER EZEANYIM: I'm looking at number five, Section 5. Is that -- you said that number five and six are in A, B, C, D. Are you referring to the instruction on this application? Because I can't go to A, B, C, D. I can see that you have Section 5 and 6 there. What do you mean by when you say Section 5 and 6?

THE WITNESS: Section 5 and 6 of the text. You see, if you have -- look on the next page. Look two pages past where you are right now. You'll see the table of contents for the overall document.

EXAMINER EZEANYIM: Yeah, okay.

THE WITNESS: So when I refer to Section 5 and 6, I'm talking five and six in the text. That's in front of all the appendices.

EXAMINER EZEANYIM: Okay. Five and six of the table of contents, okay.

THE WITNESS: That's correct.

EXAMINER EZEANYIM: So you are indicating the table of contents, okay.

THE WITNESS: Right. That's correct.

MS. MUNDS-DRY: And then if you go to page 11 at the front there, Mr. Examiner, Section 5 begins --

THE WITNESS: On page 11.

MS. MUNDS-DRY: -- on page 11.

EXAMINER EZEANYIM: Okay. All right. Now, so when I read this -- this is a very important form. When I read it, I know where to find the information.

THE WITNESS: Exactly. The reason why we did it this way is because previously we would try to fill in the information on the form itself, and it's impossible because it's just too voluminous.

EXAMINER EZEANYIM: That's true, okay. Okay, go ahead.

A. Okay. So as I mentioned, that is the way the organization -- the C-108 is organized. And what we will do today is go through all the technical details and answer, hopefully, all of your questions that you may have regarding the proposed project.

Q. (By Ms. Munds-Dry): Thank you, Mr. Gutierrez. Let's then give the Examiner an overview of the proposed construction and operation of the Jal No. 3 AGI well. And, Mr. Examiner, this is in Section 3 in the C-108, and Mr. Gutierrez

may often refer to what's been marked has Exhibit No. 5, which is the PowerPoint presentation.

A. Okay. I think I will go through the PowerPoint slides which summarize it, but if you want to turn first to Page 4 of the application, which is Section 3, the proposed construction and operation of the AGI well. It's right on Page 4. And that section will contain -- the figures that it references which I will have as well duplicated on this PowerPoint -- will, I think, provide the basis for that information.

So, as I mentioned, let me just say in a summary fashion, that the project, as Mr. Milam mentioned and I mentioned earlier, will have substantial environmental benefit due to the sequestration of CO2. It also reduces waste by eliminating sulfur production as a control for sulfur and sour gas. It will allow for the mixing of acid gas with the plant wastewater in a way that has been successfully implemented, for example, at Indian Basin plant, Marathon's plant, since '97. It's the same kind of system.

The adequacy of the target reservoir, and we'll go into detail on that, has been demonstrated not only by the geologic studies we've done, but by the fact that we have successfully been injecting fluid into that reservoir for the past 20 years at the plant.

And then, this application really details all the

information necessary to approve the installation of the AGI well. And furthermore we have, obviously, noticed all of the adjacent operators and surface owners, and they support the project. We have had no expression of opposition. In fact, quite the contrary. The adjacent operators are very happy to be able to have their programs get back on track to increase their production.

So let's go over the details. As --

EXAMINER EZEANYIM: Is this PowerPoint in this CD?

THE WITNESS: It is not, but you have copy of it.

MS. MUNDS-DRY: It's actually Exhibit 5 in your packet there, Mr. Examiner.

EXAMINER EZEANYIM: Oh, okay.

THE WITNESS: It's Exhibit 5. We have it in print right there.

EXAMINER EZEANYIM: What is in this here?

THE WITNESS: That CD that in there provides, in this Appendix B, it provides all of the detailed information. We constructed diagrams for every one of the wells within the area of review that are plugged. And then this CD has all of the additional well file information for every one of the wells that is plugged.

EXAMINER EZEANYIM: I'm looking at the file. I'd like to have the information on that in the executive summary. Is that No. 5?

THE WITNESS: Exhibit No. 5 is the printed copy of the PowerPoint.

MS. MUNDS-DRY: It's actually in here, Mr. Examiner. It is right here for you.

EXAMINER EZEANYIM: Okay. Thank you. Go ahead.

THE WITNESS: And, certainly, Mr. Hearing Officer, if you wish an electronic copy of the PowerPoint, I'm more than happy to provide you with one.

EXAMINER EZEANYIM: Okay. You can do that, if you don't mind.

THE WITNESS: It's no problem at all. So let's start out. As you well know, you've been to Jal 3, so you know where it is, but this just gives you -- this figure shows you it's about three miles, three and a half miles northeast of the town of Jal. And this gives you a little bit more detailed location.

It is in the northwest quarter of the southwest quarter of Section 33, and the southwest quarter of the northwest quarter of Section 33. It occupies about 70 acres there and it is outlined in -- let me see if I can -- yeah -- in this 70-acre area here.

Let me just talk about the generalized design for the AGI system. The initial design for the AGI system -- and what we're requesting is an approval for a system that we will initiate by injecting a combination of about one and a half

million cubic feet per day of acid gas and about 1500 barrels per day of plant wastewater combined in this system, but we would like to have the ability to -- if the project is as successful as we anticipate that it is -- have the ability to ultimately inject up to five million cubic feet a day of gas mixed with an appropriate volume of wastewater, which would take it up to a total injection of 7900 barrels a day of total fluid.

The conceptual design is shown on Figures 2 through 5 of the C-108, and we'll go over those. But if you want to either turn to the Figure 2 of the C-108, or it is the next -- let me see. Let me go backwards a little bit here. So anyway, if you turn to Figure 2 in the C-108, Figure 2B, as a matter of fact, you will -- we'll be talking about that.

EXAMINER EZEANYIM: Figure 2B?

THE WITNESS: Yes, Figure 2B.

EXAMINER EZEANYIM: Okay.

THE WITNESS: And that's just a schematic of the -- let me let you find that there.

EXAMINER EZEANYIM: Is that AGI No. 1?

THE WITNESS: No. That is Figure 2B. It says schematic of SUGS Jal 3 plant. It should be right on your --

EXAMINER EZEANYIM: I'm looking at --

MS. MUNDS-DRY: I think if you go --

THE WITNESS: You want to go earlier than that, 2B.

MS. MUNDS-DRY: It's the fourth page behind the Figures tab.

EXAMINER EZEANYIM: Okay, Figure tab. There it is.

THE WITNESS: That's 2A. There's 2B right there.

EXAMINER EZEANYIM: This one.

THE WITNESS: Yes.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Okay. So let's take a quick look at -- while you have Figure 2B there in front of you, let's take a look at the general plat plan for the facility. Just in general, this is the 70-acre plant, and AGI facility that we are going to be constructing is located here in the northeast corner of the plant.

And the next figure here gives you a little more detail of that layout. The acid gas will come from the tie-in to the -- existing tie-in to the floor -- and will be brought up here to the new AGI compressor and then on to the proposed AGI well. And the wastewater will come here from the pump building and be mixed right near the wellhead. And we'll go into more detail there. But just for reference, the existing disposal well right now that takes the plant wastewater is located right in this area where you can -- let me see -- there we go -- right here -- and the new proposed well will be located here.

This is just an aerial photograph that shows you in

more detail exactly where the existing well is -- and by the way, one of the things that we're proposing is that if this application is approved, that we will, prior to initiating the injection of acid gas and wastewater through the new proposed well, we will plug the existing well right here.

EXAMINER EZEANYIM: Can you go back to that last slide and talk more about your existing SWD well?

THE WITNESS: Sure, this one right here?

EXAMINER EZEANYIM: Yes.

THE WITNESS: Okay.

EXAMINER EZEANYIM: We approved that SWD?

THE WITNESS: It's approved and it's been operating for 20 years.

EXAMINER EZEANYIM: For 20 years. And we did allow you to inject acid gas into that?

THE WITNESS: There was never any request to inject acid gas. It was only for plant wastewater. And that well, by the way, is the Woolworth Estate SWD No. 1. And the API number of that well -- this is located on Page 1 of the C-108 -- is 30-025-27081. And again, it is our intent to plug that well when we replace it with the this new one.

EXAMINER EZEANYIM: The current well?

THE WITNESS: The current well. That's correct.

EXAMINER EZEANYIM: Do you know the order number that had approved that well?

THE WITNESS: I don't know it off the top of my head, but in the application in Appendix, I believe in Appendix A, there we have some information on that well. And I'll have to get the order number for you. I'm happy to get it during a break. I just don't know it off the top of my head.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Okay. As I mentioned, this just gives you a layout. Now let's talk about Figure 2B, which really will give you an overall schematic of what we're proposing to do here. As I mentioned -- and you can see right here in the lower left-hand corner here -- there will be a tie-in to the existing eight-inch acid gas flare line which will go north of the facility to the new AGI compression facility. It will pass through this automatic safety valve.

And then from that safety valve, we will have about 150 feet of steel line, very low pressure. It's 5 psi and 20 percent H2S, and about 78 percent CO2. Then it will enter and be compressed here in the compression facility. It will exit through this 125 feet of stainless-steel line at about 1600 psi. Again, 20 percent H2S and about 70 percent CO2 -- 78 percent CO2 -- and about 2 percent various hydrocarbons in that stream.

That will then be tied into the existing wastewater lines in a mixing chamber here. It will be mixed, the acid gas with the water. It will then be choked down, right before the

wellhead in this choke valve, from 1600 psi to about a maximum of 980 psi --

Q. (By Ms. Munds-Dry): And Mr. Gutierrez, if I could just interrupt you. I believe the schematic has a small change in it from what was in the C-108. What you're showing here and what's in Exhibit No. 5 in the PowerPoint, I think that reflects a change.

A. Thank you. I appreciate that. Because I failed to mention that to the Hearing Examiner. If you look on your hard copy of Figure 2B, you will see that it shows the choke in front of the tie-in to the wastewater lines, and that's incorrect.

The correct -- is that the choke will be after the tie-in and after the wastewater is mixed. So if you look on your Exhibit 5 PowerPoint, it has the corrected Figure 2B. And all it is -- the only difference is that the --

EXAMINER EZEANYIM: Okay, I see.

THE WITNESS: -- choke has been moved.

EXAMINER EZEANYIM: To the right.

THE WITNESS: That's correct, correct. Now, then, instead of being here, it is over here. So --

EXAMINER EZEANYIM: You want to bring the system up to 980? Before it goes to the wellhead?

THE WITNESS: Yes. And the reason is because if you look in the C-108 application on Page 5, there are two

calculations using NMOCD's approved formula for calculating what would be the maximum allowable pressure.

EXAMINER EZEANYIM: Okay. Let me get that page here.

THE WITNESS: Sure. Page 5. Just at the beginning, Page 5. It just starts after the table of contents, then look for Page 5.

EXAMINER EZEANYIM: Okay.

THE WITNESS: You can see what we've done here is the formula that OCD typically uses for calculating what would be the maximum allowable pressure at the surface for any injection well is based on this formula. And typically, you know, you just use it for water only because it's an SWD.

But because we're mixing acid gas and water here, what we've done is a volumetric calculation that takes into account the difference in the specific gravity of the acid gas and wastewater. And we come up with this pressure of about 985 to 986 pounds maximum, which actually is more than enough for what we're going to use here.

Because, as I mention, one of the big advantages that we have at this particular location, unlike many others where we have done acid gas injection wells before, is we have a very good understanding of what the reservoir will do. And right now, the reservoir -- the current order for this SWD at the facility is limited to 940 pounds because the well is not quite as deep as at what the one is that we are proposing. And also

because the acid gas layers the specific gravity a little bit of the overall fluid that's being injected.

But even though the maximum that we're allowed is 940 right now from the current SWD, it usually runs from about 450 pounds because the reservoir is such a good reservoir that it -- in fact, when it was originally started, it took the fluid on vacuum.

EXAMINER EZEANYIM: Where is the top of the perforations in this well?

THE WITNESS: The top of the perforations in the well would be at about 4400 feet and the bottom would be about 5200 feet. The packer would be set at about 4375 feet below ground surface, and that's shown right there that Figure 2B.

EXAMINER EZEANYIM: And the current SWD allows you how much -- 940?

THE WITNESS: 940.

EXAMINER EZEANYIM: At the same depth?

THE WITNESS: So it's a little shallower than that. Because it's only -- it's not fully penetrating the San Andres. It's only about -- perforated from about 4300 to about 4900 or so.

EXAMINER EZEANYIM: Did you have to demonstrate that API injection pressure increase before we gave you that -- that 940? Because if the perforation is at 4300, it would seem to me to be 860 pounds. How do you get 940?

THE WITNESS: Well, because we took into account the entire depth of the well.

EXAMINER EZEANYIM: Okay. Okay.

THE WITNESS: The 5000 feet, basically.

EXAMINER EZEANYIM: Okay. I see what you mean.

THE WITNESS: I think, really, it's a moot point because the well is going to be taking it under significantly lower pressure anyway.

EXAMINER EZEANYIM: Yeah.

THE WITNESS: And the current pressure that is allowed is 940, and that's for slightly shallower perforations and strictly water, which is a heavier overall fluid.

EXAMINER EZEANYIM: I know. I'm not concerned about that because your calculation here demonstrates that .225 here, .2259, okay. But we allow .2, so that's not very much.

THE WITNESS: Right and the difference is really because of the acid gas.

EXAMINER EZEANYIM: Right.

THE WITNESS: Exactly.

EXAMINER EZEANYIM: -- for your calculations, okay. Go ahead.

THE WITNESS: Generally, the well construction itself will be essentially shown on the next slide here, which is Figure 5. If you just go three pages past that Figure 2B, you'll see Figure 5. And that figure shows the construction,

the schematic construction, of the well. It's intended to have surface casing, 9 and 5/8-inch surface casing, down to 350 feet, cemented to the surface. And that will take it at least 150 to 200 feet below all freshwater sources in the area.

And then telescoping down to a production stream of 7-inch casing down to about 5200 feet. It depends on exactly where we find the bottom of the San Andres, but I'm anticipating, based on the existing geology, that we will find that near 5200 feet, maybe 5170. So that actually depends on what we find when we log the well.

EXAMINER EZEANYIM: Are you talking about the top or the base?

THE WITNESS: The base.

EXAMINER EZEANYIM: The base of the San Andres?

THE WITNESS: The base, right. The base. The top is around --

EXAMINER EZEANYIM: 43?

THE WITNESS: 43, exactly. And that string will also be cemented to the surface. We will have a very special kind of packer. It will be required downhole because the fluid that is going downhole is very corrosive. So we will have a clad packer and the tubing string will be a fiberglass tubing string that will lock right into that packer. And then we will have a fluid that fills the interstitial space between the tubing string and the casing. And typically we use diesel for that.

That's what the Division has approved before, is the use of diesel in that -- outside of the tubing from there to the surface.

So that's the general design for the well. If we -- let me just go -- I don't have this slide on the PowerPoint, but if you turn two pages back --

EXAMINER EZEANYIM: Let's stay on that.

THE WITNESS: Sure, sure.

EXAMINER EZEANYIM: It's very important. What is the base of the freshwater? Your casing is set at 350.

THE WITNESS: Yes.

EXAMINER EZEANYIM: What is the base of the freshwater?

THE WITNESS: The base of the freshwater, we don't know exactly at the plant site itself, because the nearest well is almost a mile away. But the base at the nearest well is about 140 feet. And we -- based on all of the information that we've taken from all of the wells around there, and we'll go into that in more detail here shortly -- the base of the freshwater of the Ogallala is probably about 125 feet. And then there may be a little bit of freshwater in the Dockum Group, right below it, and the base of that is about 210 or 215 feet at this location.

EXAMINER EZEANYIM: Okay.

Q. (By Ms. Munds-Dry): Mr. Gutierrez, what is the

proposed footage location for the Jal No. 3 AGI well?

A. The proposed location is 200 feet east of the current well. And that would be a location of -- let me look that up -- 1570 feet from the north line, and 1050 feet from the west line of Section 33 Township 24 Range 37.

Q. And who will be the operator of the proposed well?

A. The proposed well will be operated by Southern Union Gas Services, Limited.

Q. And does Southern Union have an approved bond for this well?

A. Yes. We have gotten a bond for this well and filed it with the Division already. I believe that we have an exhibit that shows that bond.

Q. Has that been marked as Exhibit No. 2?

A. The bond is not, I think, in the electronic system yet because we do not have an API number for the well, and you need an API number to file the bond in the online system. But it has been submitted and received by the Division and you can see that on Exhibit 2.

Q. And I believe you stated this, but just to make sure it's clear, what are the proposed injection volumes for the well?

A. The proposed injection volumes for the well would range from a volume at the lower end of 2300 and -- let me

just, so I don't get the number wrong, let me look at my figure -- 2318 barrels per day at the low end, and 7929 barrels per day at the high end. And that would be combined acid gas and wastewater.

Q. And will the system be open or closed?

A. It will be a closed system.

Q. And you went over the calculations of -- you'll be injecting under pressure or by gravity?

A. Well, we will be injecting under pressure. But I anticipate that the pressure would be significantly lower than the maximum allowable pressure. Because, like I say, we have records over 20 years of what we've been injecting there, and we have been experiencing pressures that generally range between 400 -- well, originally, like I said, the well took fluid almost under gravity the first -- when it first started. But after it's been in operation for 20 years, it's still taking fluid now at about 450 pounds, which is about half of the allowable pressure.

Q. And I believe you stated that with these calculations, the maximum injection pressure you are requesting is 986 psi?

A. That is correct.

Q. And if higher pressure is needed, will Southern Union justify the higher pressure?

A. We will, although I think it's unlikely that we

will require that.

Q. And have you provided an expected fluid composition of the fluid to be injected?

A. We do have a fluid composition. The acid gas stream, as I mentioned, is about 78 percent CO2, about 20 percent H2S, and then about 2 percent C1 through C7, basically, hydrocarbons.

And then the plant wastewater stream has been characterized in the existing discharge plan for the facility. And that is, I think, a separate exhibit under here. Because I wanted to mention -- I haven't had a chance to mention that yet, Mr. Hearing Examiner, as a result of this application, we have been in contact with the Environmental Division, Mr. Chavez and Mr. Price, of the Environmental Division. And they said that it would be required to have an amendment to the discharge plan to take care of this combined injection.

And we have prepared such an amendment, including a Rule 18 plan for the project. And that has been submitted. And, in fact, last week we received the determination that that submission was administratively complete and the Division would be noticing that amendment for the discharge plan. And that has been provided as well as an exhibit to you here.

MS. MUNDS-DRY: Mr. Examiner, Exhibit No. 3 is a copy of the cover letter that we submitted to Mr. Chavez. And if you would like a copy of the complete amendment, I would be

glad to provide that to you. I just didn't want to overload you.

EXAMINER EZEANYIM: Okay. It's okay. They have this, right?

THE WITNESS: They do.

EXAMINER EZEANYIM: As far as the amendment, amend the --

THE WITNESS: That is correct.

EXAMINER EZEANYIM: What are you amending?

THE WITNESS: It's amended because of the addition of the AGI and the combination of the waste -- the rerouting of the wastewater to the AGI well.

EXAMINER EZEANYIM: But the wastewater now will be combined with the AGI to be put into this well?

THE WITNESS: That is correct.

EXAMINER EZEANYIM: Is that what you are also asking in the amendment?

THE WITNESS: That is correct.

EXAMINER EZEANYIM: Okay. Before you go any further, I want to ask about the production casing.

THE WITNESS: Yes.

EXAMINER EZEANYIM: You said that it's 100. Is that 100 to the surface? What are you saying -- how it will be cemented on that production casing?

THE WITNESS: Yes. I think that on this figure -- I

think that was an error. Because I believe that we're likely to have the stream go down to 5200, so that's an error. I'm sorry about that.

EXAMINER EZEANYIM: So are you going to cement it at the surface?

THE WITNESS: We are indeed.

EXAMINER EZEANYIM: Okay. So that's what I mean, if you -- okay. If you put that 7-inch casing to the surface?

THE WITNESS: That is correct. And, as a matter of fact, we're evaluating now a variety of different kinds of cement. Halliburton has got some special cement that is used in situations where you have highly corrosive environments. And we'll probably be using that kind of a thermal ox-type cement.

EXAMINER EZEANYIM: Okay.

Q. (By Ms. Munds-Dry): Mr. Gutierrez, would you explain how Southern Union proposes to mix the fluids at a constant pressure?

A. Well, the mixture of the fluids will take place in that location where I showed you just in front of the choke valve, and it will be using this same patented process that Mr. Eaton at the Masters Corporation has developed and has been used for the last ten years at Indian Basin by Marathon.

Q. And what is the status of the land on which the well will be located and drilled?

A. The land is owned by Southern Union Gas Services. It is on their plant site.

Q. And this an expansion of an existing project?

A. No. It is a new project.

Q. Now, let's turn to the geology. Explain your efforts on behalf of Southern Union to find a suitable location for this proposed well.

A. Sure. So if we step back a little bit to August of last year when Southern Union asked us to look at this, they said, well, "First, maybe, would you look and see if we could use our existing well for disposal of a combination of acid gas and wastewater?"

And we talked with them about how we would evaluate the possibility or the potential for the reservoir overall to take this acid gas and then, as a separate item, we evaluated whether we could use the existing well or if we would have to drill a new well. We concluded -- and I'll tell you to conclusions first and then I'll tell you how we got there -- basically we concluded that the reservoir is quite capable of accepting wastewater and acid gas safely without affecting either potential or existing oil and gas production, and certainly without effecting any freshwater in the area.

But we felt that the existing well, which has been in the ground for 20 years, and we don't have a detailed cement-bond log, et cetera, on the well, we felt that that was

not a good choice for an AGI well, that it would be better to plug and abandon that well and drill a completely new well, provide the Division with a cement-bond log for the whole new well all cemented to the surface. And we would just have better control over the ability of the well to perform the way we want it to over a long period of time.

The current well is actually open-holed in the San Andres, so it's not -- the casing only goes to a little bit at the top of the San Andres and it's open-holed the rest of the way. And that's really not the ideal situation for an acid gas injection well. So we proposed the replacement of the existing well. But the reservoir itself is quite capable of taking the gas.

EXAMINER EZEANYIM: But you have a new well -- completion, too. In your new well -- if you look at the schematic in that Exhibit 5, as I said, the rest is in an open hole?

THE WITNESS: No. We have a production casing going down to 5200 and then it's perforated. It's not open-holed.

EXAMINER EZEANYIM: Okay. That's perforations there? I thought that was open hole?

THE WITNESS: No. That's perforations there. See, you can -- right there, casing perforations 4375 to 5200.

EXAMINER EZEANYIM: Okay. Very good.

THE WITNESS: Okay. So what are we looking for in a

reservoir that takes CO2 and the acid gas? One, obviously we want a good geologic seal to permanently contain and sequester the gas and to keep it, of course, isolated from any fresh groundwater. We want it, ideally, to be below existing or potential production so it doesn't inhibit or in any way affect people's ability to produce oil and gas in the area.

We want the reservoir to be laterally extensive, permeable, and have good porosity. And we want to have compatible fluid chemistry.

Our investigations of these factors have been kind of outlined here on this slide where we went through and we identified all of the background geologic data. That is summarized in Section 4 of the text of the C-108. We located and evaluated all of the wells in the local area. That's evaluated in Section 5 and Appendices A and B of the application. We evaluated the stratographic information to confirm that the reservoir meets the basic geologic criteria that I outlined above.

We constructed a series of cross-sections. We reviewed in detail the existing well performance and test data. We conducted a preliminary reservoir analysis based on all of that data. And we concluded that it was indeed a very good reservoir, and I'll go into those details just now.

I will mention, also, that one of the things that is excellent about this reservoir is, as you will see, the way

that it is structurally located in the area. And, stratographically it has a small trough depression that actually occupies about two and a half square miles in the vicinity of the plant, and that area is going to be an excellent location for containing that acid gas. Plus the zone above the San Andres is quite impermeable and has a good separation between that and the Yates and Queen interval, which is what most of the production in the area comes from.

Furthermore, I want to emphasize, Mr. Hearing Officer, based on previous applications and work that we've done with the Division, the C-108 regulation really only requires that you look at an area of review of half a mile around the proposed well. But because this is an acid gas injection well, we have expanded the area of review to one mile around the well. And, consequently, we also expanded the notices that were provided to all of the operators and surface owners for one mile around the well.

As you will see shortly here, there are many shallow wells in the area. Most of them producing from the Yates and Queen interval or shallower. There are only a few deep wells in the blind -- and that's about two to three miles east outside of the area of review. And, in fact, even though those wells are outside the area of review, we contacted those operators to make sure they were aware of what we were doing, and they expressed no concern or they expressed, in fact,

support for the project.

EXAMINER EZEANYIM: Outside the one mile --

THE WITNESS: Even outside the one mile, that's right. Because those were the closest deep wells that we had. And we used those wells to help us evaluate the stratigraphy because that was the only -- that and the existing well are the only ones that penetrated the San Andres in the area.

The stratographic analysis indicates that the best recommended location would be about 200 feet east of the existing well. And the pressure data, as I mentioned earlier, indicate that the reservoir will be able to take the gas at significantly below the maximum requested allowable pressure of 986.

You can see this looks like a shotgun target, but this is Figure A1. It's in Appendix A. It's right behind the first page of Appendix A. This shows the location of all of the wells within two miles of the current and the proposed AGI well. You can see these wells, the black ones, are active wells. The blue, light blue, are wells that are plugged. The purple are temporarily abandoned wells. And then there's a couple of permit wells that have never been drilled, and those are shown in red. And, of course, the existing SWD. And at this scale, frankly, the proposed well would be located right here at the same location.

So we looked at all of the wells within a two-mile

radius. Those are detailed and tabulated and all the information on those wells tabulated on pages -- the pages following this map in Appendix A. Then we narrowed it down to within the area of review, the one-mile radius. And that figure on the left here is Figure A2. And that you will also find in Appendix A after the tabulation of the wells in a two-mile radius. This shows all of the active wells within the one-mile radius. All of those wells, as you mentioned, are in the Yates and Queen. None of those even penetrate the Grayburg in the -- above the San Andres.

EXAMINER EZEANYIM: Is that shallower than the San Andres?

THE WITNESS: Significantly shallower, yes. And these wells, the color-coded -- the blue are -- there's basically two pools in this whole area. The whole area is pooled and unitized. One is the Jalmat pool and the other is the Langlie Maddix pool.

And so the wells that are in each of those respective pools are shown in the two colors on this map. The figure to the right, Figure B1, is also found in Appendix B right following the -- it's the first figure in Appendix B. And that shows all of the temporary and abandoned or plugged and abandoned wells within a one-mile radius of the proposed well. And this shows -- in all of the details on these plugged wells, including plugging by them, so each and every one of them is

included in Appendix B.

And then the question that, Mr. Hearing Officer, that you had regarding the CD? The CD that is in that gives you even more -- all of the OCD information for each one of those plugged wells, if you care to have it in one location there. We didn't print it all out because it would have made the thing three inches thick, all of the well files for every one of those plugged wells.

EXAMINER EZEANYIM: Okay. So how many do we have here?

THE WITNESS: We have a total of: One, two, three, four, five, six -- they're shown on this page. What we have is a total of about 20 -- we have one, two, three, four, five, six, seven, eight, nine, ten plugged wells. One, two, three, four, five, six, seven, eight temporarily abandoned wells.

EXAMINER EZEANYIM: In the one-half-mile area in review?

THE WITNESS: In the one-mile.

EXAMINER EZEANYIM: Okay. In the one-mile area review. And you have ten plugged and abandoned?

THE WITNESS: Yes.

EXAMINER EZEANYIM: And it is here?

THE WITNESS: That is correct. All of them above well above the San Andres.

EXAMINER EZEANYIM: Okay. Most of these are above

the San Andres.

THE WITNESS: They are all above the San Andres.

EXAMINER EZEANYIM: And so -- these plugged and abandoned ones are on this schematic in here?

THE WITNESS: That is correct. They're all in Appendix B.

EXAMINER EZEANYIM: Okay. Now the area of abandoned --

THE WITNESS: The schematics are in there as well for those.

EXAMINER EZEANYIM: Okay.

THE WITNESS: And all of the detailed well files for those 20 wells are what are included in the CD that you have here.

EXAMINER EZEANYIM: I have 18 wells. Where are the other two? You said 10 PAs and 8 TAs. You said 20. I have 18 in the area, one-mile area review, is that --

THE WITNESS: Let's see one, two, three, four -- 19, I'm sorry, total.

EXAMINER EZEANYIM: Okay. So 10 PAs and 9 TAs.

THE WITNESS: No. 8 TAs. There's one there that has never been drilled. It was permitted but never drilled.

EXAMINER EZEANYIM: It was not drilled?

THE WITNESS: Not drilled. That is correct. So that's why we have a total of 19; 8 TAs, 10 plugged, one not

drilled.

EXAMINER EZEANYIM: Okay. Who are you going to drill that well?

THE WITNESS: I think it is -- it was an ancient well. It was even pre Onguard. So I think the application has, you know -- it never was drilled. And I think it was -- the application drilling permit for it is probably like 20 years old, you know.

EXAMINER EZEANYIM: You did say the 19 includes the -- that is permitted?

THE WITNESS: No. Because that's in the active well list. This is only plugged and abandoned and TA.

EXAMINER EZEANYIM: Okay. How many do you have on the active well list? We might look at active well list, not one-mile area, if you have those.

THE WITNESS: Sure. That is in Appendix A, and there are -- I can count them for you, let's see.

EXAMINER EZEANYIM: Okay.

THE WITNESS: They're shown on two pages there. There's quite a few wells.

EXAMINER EZEANYIM: Those are the active wells.

THE WITNESS: That's correct.

EXAMINER EZEANYIM: It doesn't include the plugged and temporarily abandoned ones?

THE WITNESS: No. That's right. We segregated

those.

EXAMINER EZEANYIM: So the status of these were active because that's one of the questions I have: I said, status. Is the status active? The status of those wells are active, most of them are injection oil. All of them are active, right?

THE WITNESS: That's correct. But those injection wells are mostly all secondary recovery wells, you know, where they're just injecting waters into the Yates-Queen for secondary recovery.

EXAMINER EZEANYIM: Yeah. I made a note here. I said, is the status active? If you drill those oil wells, are they going to be producing oil?

THE WITNESS: Yes, they were.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Again, I want to emphasize those are very shallow, much higher than the San Andres. They're all in the Yates and Queen.

EXAMINER EZEANYIM: Okay.

THE WITNESS: The Yates-7 Rivers.

EXAMINER EZEANYIM: Do you have depths -- you have depths here?

THE WITNESS: Yes. The depths are there. You can see the total depths are generally about 35- or 3600 feet.

EXAMINER EZEANYIM: Okay.

THE WITNESS: The deepest is 4000, as a matter of fact.

EXAMINER EZEANYIM: On these calculations, where is the depth?

THE WITNESS: If you see right next to well type, it says total depth?

EXAMINER EZEANYIM: Maybe I'm --

THE WITNESS: I think you're on the right table. Table A2, is that what you're on?

MS. MUNDS-DRY: It's the second to the last column.

THE WITNESS: It's the second to the last column.

EXAMINER EZEANYIM: Table --

THE WITNESS: A1, I think. So you want to keep going. The six-page long table is the two-mile table. So you want to go all past that.

EXAMINER EZEANYIM: Okay. Past that.

THE WITNESS: Okay. Keep going. Keep going. And now behind there, there you go.

EXAMINER EZEANYIM: Okay. These are --

THE WITNESS: That's within one mile.

EXAMINER EZEANYIM: Okay. Within one mile.

THE WITNESS: You can see there next to well type it says total depth?

EXAMINER EZEANYIM: Okay. So out of that two-mile area, you extracted this one mile?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: That's really what I'm asking.

THE WITNESS: That's correct.

EXAMINER EZEANYIM: And most of these wells are active, right?

THE WITNESS: All of these are active, yes. And these would -- that list would include -- if you'll notice there's one well on there operated by Southern Union Gas Services, on the second page of that table.

EXAMINER EZEANYIM: Yeah.

THE WITNESS: And that is the existing SWD well. If you look under there where it's got the pools and you see the one that says disposal.

EXAMINER EZEANYIM: Yeah.

THE WITNESS: And that's the one well that says 4702 feet total depth? That's the current disposal well at the facility.

EXAMINER EZEANYIM: Okay.

THE WITNESS: That is the one that will be plugged and abandoned when replaced by the AGI.

EXAMINER EZEANYIM: Okay.

THE WITNESS: And you can see that's the only well that even penetrates the San Andres on the entire list.

EXAMINER EZEANYIM: Okay. Good. Go ahead.

THE WITNESS: Okay. This is just a map showing --

EXAMINER EZEANYIM: Before we go on, there is no well that penetrates deeper than the San Andres in this one-mile area review that's not -- they are all above?

THE WITNESS: That's correct. The only one that even penetrates the San Andres is the well that Southern Union is currently using for disposal.

EXAMINER EZEANYIM: Oh, you said disposal, yeah. The Woolworth --

THE WITNESS: Estate --

EXAMINER EZEANYIM: 05.

THE WITNESS: That's right.

EXAMINER EZEANYIM: Okay. Go ahead.

THE WITNESS: Okay. So I constructed a couple of cross-sections in the area to show you what the -- generally, what the San Andres looks like. This is what we used to evaluate the ability of the reservoir the take the gas.

You can see, as I mentioned, all of the wells within the one-mile area. You can see it's all these shallow wells here. This well right here is the current disposal well at the facility. You can see it doesn't fully penetrate the San Andres. It only goes to about 4700 feet.

And then this well farther to the west and this well farther to the east are wells that are deeper than the -- but they fully penetrated the San Andres, and we just use them for stratographic control across the area.

EXAMINER EZEANYIM: Okay. Are they within one mile or two miles away?

THE WITNESS: This well, for example, is in Section 27. It's three miles away. This other well is in Section 6, and it is about two and a half miles away.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Another cross-section through the area, and looking again to the wells that were farther away from the existing well, we have this well in Section 5, which fully penetrated the San Andres. This is our disposal well that we will plug right here, and you can see it doesn't penetrate the entire formation.

And then, here, the well farther to the east that is in the -- penetrates the San Andres, but it goes down to the blinebry. But I want to point out, if you notice there's this slightly lower area here. And I'll show you what that looks like based on the stratigraphy on the following map.

EXAMINER EZEANYIM: About that middle well. Talk more about that middle well.

THE WITNESS: This one?

EXAMINER EZEANYIM: Yeah. What well is that?

THE WITNESS: That is called the Langlie Jal Unit Well WS No. 2. That is a well that is located in Section 5 of 25 South 37 East. So it's quite a ways away. It's about four miles, five miles away.

EXAMINER EZEANYIM: Okay.

THE WITNESS: It's just that there's not much control there, so we had to use what we can use.

EXAMINER EZEANYIM: Yeah.

THE WITNESS: So based on that, we constructed this map here. This shows a circle which indicates the one-mile area reviewed. This is the current disposal well. And the colors show the porosity, how many feet of porosity we have, net porosity in the San Andres. You can see it increases as it goes to the southwest here.

But it is along about roughly 300 -- I'd say about 380. In the current well, we only have about 350. But it doesn't fully penetrate the San Andres. But we have about 380 feet of net porosity -- over six percent in this area.

This map is a structure map on top of the Grayburg, because we couldn't really do it on top of the San Andres because there's not enough wells to penetrate it. But the good thing is that the Grayburg in that area is conformable with the San Andres. So if we do the structure on the Grayburg, we see the same structure underlying it in the San Andres.

And you can see this area that is deep purple color, this is that structural trough that I was describing. And here is the current saltwater disposal well. So that plays into how we think the injection fluid will spread over the 30 years of injection. And this is what that figure shows.

This figure shows -- you can see, again, the one-mile circle. This is that trough area. And based upon our best analysis, this small red circle here indicates the total extent of the injected fluid that we will see after 30 years of injecting at this lower rate of 2300 barrels per day. This larger area shown by the thicker red line would be 30 years of injecting at the higher rate.

So you can see in this case we would be talking maybe about 160 to 180 acres total that the lateral extent of the injected fluid if we injected it for 30 years at the higher rate, we're looking to something closer to a square mile of area in the reservoir.

EXAMINER EZEANYIM: What are these calculations here? I know you did some calculations to come up with those numbers.

THE WITNESS: Right. And let me see if we actually have the calculations. I don't know if we have those calculations in here, but, again, I'd be happy to provide those to you.

EXAMINER EZEANYIM: I know you did some.

THE WITNESS: Exactly. What we did was basically take a look at the average porosity there and we calculate the volume of the injected fluid and then look at the porosity thickness and then calculate what lateral extent would fill it up, basically.

EXAMINER EZEANYIM: Maybe doing some -- formations

around there.

THE WITNESS: Yeah. I mean, you have to make those kinds of assumptions, but, you know, that's why -- I think this is basically to give an idea of what that extent would be. It's not exact.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Okay. Then a very important aspect that we talked about earlier is the freshwater in the vicinity of the proposed well.

Here, again, is the proposed AGI well. Here you can see the one-mile circle. We detailed information -- not just on the well -- there's only a single well here, water well, inside that one-mile circle. There are a few water wells outside of it here and we provide all of that information for you in Section 4 of the -- on Page 10 of the application. All the owners of the wells, where they're located and what available information there is from the State Engineer's Office.

EXAMINER EZEANYIM: Did you do some water analysis of this water?

THE WITNESS: There is no water -- there was no water analysis available in the State Engineer's files for those particular wells, but we did have water analysis from some of the farther away wells, and we included that, actually, not in the C-108 but in the discharge plant application. But,

basically, the Ogallala groundwater in this area ranges from about 600 milligrams per liter to 2000 milligrams per liter of total dissolved solids. And that is -- we provide the reference for that. That's based on the work that Nicholson & Klepsch have done in that area. It's published by the Bureau of Mines.

EXAMINER EZEANYIM: Okay.

THE WITNESS: And, again, I mentioned that this well has a total depth of 110 feet, and that's really the base of the Ogallala at that location. So, as you can see, we're proposing to go well below that and below the Dockum Group to set the surface casing.

Q. (By Ms. Munds-Dry): And in your opinion, will the injection of acid gas and wastewater pose a threat to any freshwater supplies in the area?

A. Absolutely not.

Q. And based on the results of your examination of available geologic and engineering data on this reservoir, have you found any evidence of open faults or other and hydrologic connections between any injection intervals and any underground source of drinking water?

A. We have not and we have made an affirmative statement to that effect in Section 7 of the application.

Q. And you went over in detail before your review -- in the area of review -- as required by Division rules, have

you reviewed the data available on the wells within the area of review and satisfied yourself that there is no remedial work required on any of these wells to enable Southern Union to safely operate this project?

A. We have. In fact, as I mentioned to Mr. Hearing Officer, that we had done a full review of all of those wells and done the plugging diagrams and the TA and provided that information in the application.

Q. Now, lets turn to our notice. Identify and review what's been marked as Exhibit No. 3 as well as parts of the C-108 application that include notice.

A. Sure. Exhibit No. 3 --

Q. Or No. 4. I'm sorry.

A. Yeah, that's right. Exhibit No. 4 is the Affidavit of Publication of the legal notice in the Lovington Leader and in the Hobbs News Sun. We published the legal notice in both of those papers and then, as I mentioned, if you'll look at Appendix D of the application -- I'm sorry -- Appendix C first -- of the application, that identifies all of the operators and leases in the area of review. And all of those -- and the leases of those operators is Table C-2 -- and all of those operators were not only provided notice of our project, but they were provided with a full copy of the application. That Appendix also has all the certified mail receipts.

And then in Exhibit 4, we have copies of all of the return receipts for all of those notices of the operators. And then Appendix D in the application shows all of the surface owners, and there were eight surface owners within that one-mile radius. All of those surface owners were likewise noticed, not only with the notice, but they received a full copy of the application. And, again, those certified mail receipts are copied in Appendix D, and all of the certified mail return receipts are copied in Exhibit 4.

Q. And are you aware if Southern Union received any objections to this application from either the operators or any of the surface owners?

A. No. And I personally contacted all of the operators several weeks after the application was sent to them to ask them if they had any questions about the application and to make sure that they had received it. And, as I mentioned earlier, the ones that I spoke to either had absolutely no objection or they supported the project.

Q. And, in your opinion, will the granting of this application be in the best of interests of conservation, prevention of waste and protection of the environment?

A. Yes.

Q. And also, in your opinion, will the granting of this application protect human health and the environment?

A. Yes. And I think that's very important, because

it will, not only in the context of the safety built into the project for protecting freshwater, for example, and production, but most importantly because it will sequester a significant amount of CO2 that would otherwise be released to the atmosphere.

Q. And were Exhibits 1 through 5 either prepared by you or complied under your direct supervision?

A. Yes.

Q. With that, Mr. Examiner, we would move the admission of Exhibits 1 through 5 into evidence.

EXAMINER EZEANYIM: Exhibits 1 through 5 will be admitted.

MS. MUNDS-DRY: That concludes my direct examination of Mr. Gutierrez.

EXAMINER EZEANYIM: Thank you. Mr. Brooks?

MR. BROOKS: I have no questions. I'll let you do the questioning.

EXAMINER EZEANYIM: Mr. Gutierrez, you did a good job here. It's important to understand exactly what you are doing before we -- you did a very good job. However, I may have some questions for you.

THE WITNESS: Excellent. No problem.

EXAMINER EZEANYIM: It occurs to me that you might inject up to some 979 barrels of acid gas per day, and that would be more than the five meters that you're asking; is that

correct?

THE WITNESS: No. That would be the combined fluid. If you look on Figure -- and I should have put those on the PowerPoint here. Let me see. Maybe I can just do that so we can look at them all.

But if you look at Figures 3 and 4 in here, one is a -- that's a process flow diagram, Figure 3 and Figure 4. One is of the low case. That one right there is of the low case. And you can see in the bottom right there, we're looking at 578 barrels a day of acid gas mixed with 1740 barrels a day of wastewater. Look at the very -- right there at the bottom where it says "Final" and "Inject Water."

EXAMINER EZEANYIM: Okay.

THE WITNESS: You can see the top is the acid gas, so that's what would be the combined 2318 barrels per day. And then if you look at this next figure, that's the high case, the five million cubic feet. And you can see that five million is 1900 barrels a day of acid gas, roughly 1929, actually. And 6000 barrels per day of wastewater. So it's the combined fluid. It's not all acid gas.

EXAMINER EZEANYIM: Okay. Do you have the calculation of how you combined the MMCF to barrels? How did you do that?

THE WITNESS: Yes. I don't have the calculation in front of me --

EXAMINER EZEANYIM: But you know that you did it.

THE WITNESS: Yes. Oh, absolutely. And, as a matter of fact, it's so funny, because an earlier acid gas injection well that you have -- that the Division approved for the Linum Ranch plant that we just put in, actually, at DCP, it was also for five million cubic feet. And I remember the number is exactly the same, 1929 barrels per day of acid gas.

EXAMINER EZEANYIM: It's important. I would really like to see how you calculated that. Because there's a lot of variables that can be in the conversion from the MMCF to barrels. I would like to see how you did that.

THE WITNESS: Okay. I don't have it here with me.

EXAMINER EZEANYIM: You don't have to provide it now. You can get it later.

THE WITNESS: Okay. I'm happy to do that.

EXAMINER EZEANYIM: I don't want you to provide it now. If you can provide it through your attorney, that would be great. Or you can send it directly to me.

THE WITNESS: I can do that also, happily.

EXAMINER EZEANYIM: Now, is this -- if this order were to be approved, what injection rate are you -- I mean, not injection rate -- I mean the acid gas are you maximum? Is that five million cubic feet, or what are you asking?

THE WITNESS: What we're asking for is approval to inject from a total fluid injection combined acid gas and

wastewater of 2318 barrels per day to a maximum of 7929 barrels per day, combined flow. That would be comprised of 578 barrels per day acid gas at the low end, and 1929 barrels per day acid gas at the high end, 1740 barrels per day of wastewater at the low end, 6,000 barrels per day of wastewater at the high end. And that's shown, again, in Figures 3 and 4.

EXAMINER EZEANYIM: Figures 3 and 4.

THE WITNESS: Figures 3 and 4. And it is in the text in Section 3, I believe. Yes, it is in Section 3 on Page 4. If you look at the bottom paragraph, the next to the last paragraph on Page 4, it details all of that for you.

EXAMINER EZEANYIM: On Section 4?

THE WITNESS: Section 4 of the text. It's the other way there.

EXAMINER EZEANYIM: Okay. Section 4 of the text?

A. It's on Page 4 -- I'm sorry. Page 4, not Section 4. Page 4, Section 3.

EXAMINER EZEANYIM: Okay. Now, injection rates what -- I mean, yeah. How much injection rate are we talking about? 960 psi? Is that it?

THE WITNESS: That would be the maximum we are requesting.

EXAMINER EZEANYIM: Initially you can go by, you know .2 psi before. Let's say I look at your depth and perforation.

THE WITNESS: Yeah. If you look at -- we use .2 psi,

but we corrected that for the mixture of the acid gas and the wastewater. And that's shown on Page 5 how that -- all of that calculation is laid out for you on Page 5.

EXAMINER EZEANYIM: Yeah, it is. Normally if you use that .229, you're going to come out perforation for 75. That would give you about 980, or 980, something like that. About 975 -- 875 psi.

THE WITNESS: Right.

EXAMINER EZEANYIM: I mean, 875 psi. Is that your initial -- would that be okay if you got 875?

THE WITNESS: No. I don't think so. Because I think it would be more appropriate -- like I say, even the current well, which is not even --

EXAMINER EZEANYIM: Is 940.

THE WITNESS: Is 940. So -- and this one is going to be even deeper. I think if you take the middle of that injection zone and use that --

EXAMINER EZEANYIM: Okay.

THE WITNESS: I mean, but I think if you go anywhere between 940 and 980, we wouldn't have a problem there. But we would prefer -- I think the right number is 986, based on the calculations.

EXAMINER EZEANYIM: Okay.

THE WITNESS: Again, I don't think that it will be an issue because I think that we are, you know, getting pressures

that are significantly lower than that, anyway.

EXAMINER EZEANYIM: Yeah. Now, you are -- what is the tubing you are going to be using? Are you going to be using that tubing?

THE WITNESS: Yes.

EXAMINER EZEANYIM: And that is made of stainless steel?

THE WITNESS: No. I think that we're considering two different kinds. One would be an epoxy-lined tubing, L88. Let me see what the specific --

EXAMINER EZEANYIM: And you are considering that you're going to be injecting a corrosive?

THE WITNESS: Absolutely.

EXAMINER EZEANYIM: So the epoxy is the best tubing that you are going to use?

THE WITNESS: Either the epoxy or fiberglass. We're in discussions now with -- our petroleum engineer is discussing that now with Halliburton and Schlumberger now, and we really haven't decided which is going to last longer. We're going to pick the one that is going to be most resistant to the corrosion. Either fiberglass or epoxy line.

EXAMINER EZEANYIM: Okay. And they will be three inch?

THE WITNESS: What's that?

EXAMINER EZEANYIM: It will be three inches.

THE WITNESS: That is correct.

EXAMINER EZEANYIM: Can you describe your attack again? You say acid gas, how do you treat it? You know usually acid gas comes out from the gas plant. How do you treat it to get your 78 CO2, 20 H2S. I mean, that's what you are accomplishing, that 78 CO2 --

THE WITNESS: That's correct.

EXAMINER EZEANYIM: Then 20 H2S. How do you treat that acid gas when it comes out from the processing plant?

THE WITNESS: I think that is the composition of the acid gas stream that would now be going to the SRU. So it's the same treated as a gas stream. Now, if you wanted more details on that, I think I could provide --

EXAMINER EZEANYIM: So those compositions go to the SRU currently?

THE WITNESS: That is correct.

EXAMINER EZEANYIM: Okay. Then what would happen to the SRU if this were to be approved? Are you going to get rid of it? Continuing using it?

THE WITNESS: I think the intent is that initially the SRU will continue to be used. If at some point in the future it seems that the injection at the higher rate is feasible and is more desirable to eliminate the SRU, then I think that's an option down the road. But I think Southern Union's current plan is to continue to use the acid gas for

that excess capacity that Mr. Milam described.

EXAMINER EZEANYIM: Okay. Is that right?

MR. MILAM: Yes, sir. That's correct.

EXAMINER EZEANYIM: You're not going to use that SRU.

THE WITNESS: At least not immediately. That's correct.

EXAMINER EZEANYIM: The schematics of the review wells --

THE WITNESS: Yes.

EXAMINER EZEANYIM: -- they also indicate cement tops, those there -- the cement tops on those are all plugged and abandoned? Let me see. It's very confusing. They are plugged and abandoned --

THE WITNESS: Yes. They are -- we did have all of the information on the cement jobs for those wells and that is what we used to construct the diagrams that you find in Appendix B. And if you just take an example -- let's just take an example. You see the very fist diagram in Appendix B --

EXAMINER EZEANYIM: Yeah.

THE WITNESS: -- for Woolworth No. 4, you can see we have provided the detail on the cementing and the plugging and how it was set. And, then, like I said, all of this information was taken from the OCD records, and those records are included on the CD right here.

EXAMINER EZEANYIM: Okay. That was other question:

Where did you get your information, okay.

THE WITNESS: Yes.

EXAMINER EZEANYIM: Can you describe the packer, the packer that is going to be set for the -- again, what metal?

THE WITNESS: It's a inca-clad packer that Schlumberger has. We're trying to finalize the design, but it's the same kind of packer that we have used on other acid gas wells. And it is a completely clad packer where the tubing string locks right into the packer. And it is a retrievable packer. But ideally it should be able to stand up to the corrosion so that we do not have to ever take that packer out.

EXAMINER EZEANYIM: So you have about 800 feet of injection fluid into that formation from 4375 to 5200.

THE WITNESS: That is correct.

EXAMINER EZEANYIM: Apart from the Ogallala, there is no information or no other freshwater formations in this area?

THE WITNESS: There sometimes is freshwater found in Dockum Group right below the Ogallala. And there sometimes may be isolated little freshwater above the Ogallala in like the bottom of an arroyo or something like that. But the main freshwater source is the Ogallala and then occasionally there is some in the Dockum Group immediately below the Ogallala. However, it does not exist any deeper than, like I mentioned, approximately 200 to 210 feet.

EXAMINER EZEANYIM: For the Dockum Group?

THE WITNESS: That's correct. The Ogallala bottoms out about 120, 115 in that area.

EXAMINER EZEANYIM: Okay. I think you just said that there are no open faults or anything that would complicate the injection fluids in the formations?

THE WITNESS: That is correct. It's actually kind of like a pancake. There's not much going on.

EXAMINER EZEANYIM: And that's what you found out with your geology?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: Okay. That's all the questions I have. However, if I have, you know -- as I review this and I have more questions, I'll call you.

THE WITNESS: I'll be happy to answer them. And I think you have -- did I give you one of my cards? I think I did. It should have my e-mail. And that has my e-mail on there as well.

EXAMINER EZEANYIM: Okay. Thank you. You may be excused now.

MR. BROOKS: There is one thing I probably ought to ask about within my limited area of expertise here. Your notices to operators, I believe that's in Appendix C?

THE WITNESS: That's correct.

MR. BROOKS: Who did your land work?

THE WITNESS: Garth Tallman did it. He works with

Knewt Lee's firm.

MR. BROOKS: Yeah. Now, the production here is all shallower than the San Andres; is it not?

THE WITNESS: That's correct.

MR. BROOKS: That's what it looked like from your existing well?

THE WITNESS: That's correct.

MR. BROOKS: So when you trace who are the operators, those are the operators of those shallower wells, right?

THE WITNESS: That's correct.

MR. BROOKS: Now then, did your people then determine whether or not the leases that were enforced extended to the San Andres formation?

THE WITNESS: They do. They're full-depth leases.

MR. BROOKS: So there is no unleased, there are no unleased areas -- or are there any unleased areas within your area of review?

THE WITNESS: Within the area of review, there are none.

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

MS. MUNDS-DRY: Mr. Examiner, Southern Union is anxious to get this project started. Would it assist you if I drafted a proposed order?

EXAMINER EZEANYIM: What did you say?

MS. MUNDS-DRY: Would it assist you if I drafted a

proposed order? Just because Southern Union is anxious to get this project started. I don't want to rush you, but if it helps you, I'm happy to do that.

EXAMINER EZEANYIM: Okay. Yeah. You might provide a proposal. That's okay. We will accept it and look at it. It doesn't have to be in that form, but is that what you were looking for?

MS. MUNDS-DRY: I understand. Thank you.

EXAMINER EZEANYIM: Anything further?

MS. MUNDS-DRY: Nothing further.

THE WITNESS: Thank you very much.

EXAMINER EZEANYIM: Okay. At this point, Case No. 14080 will be taken under advisement. And I think that concludes the hearing today?

MR. BROOKS: As far as I'm aware.

[Hearing concluded.]

I hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 14080 heard by me on 2/7/08.

_____, Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

I, JOYCE D. CALVERT, Provisional Court Reporter for the State of New Mexico, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this proceeding.

Joyce Calvert

JOYCE D. CALVERT
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