

1 STATE OF NEW MEXICO  
2 ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
3 OIL CONSERVATION DIVISION  
4

5 IN THE MATTER OF THE HEARING CALLED  
6 BY THE OIL CONSERVATION DIVISION FOR  
7 THE PURPOSE OF CONSIDERING:

8 APPLICATION OF ARMSTRONG ENERGY CASE NO. 14341  
9 CORPORATION FOR APPROVAL OF A UNIT  
AGREEMENT, CHAVES COUNTY, NEW MEXICO

10 APPLICATION OF ARMSTRONG ENERGY CASE NO. 14342  
11 CORPORATION FOR APPROVAL OF A  
12 WATERFLOOD PROJECT FOR ITS  
13 ROUND TANK QUEEN WATERFLOOD UNIT AREA  
14 AND QUALIFICATION OF SAID PROJECT FOR THE  
RECOVERED OIL TAX RATE PURSUANT TO THE  
ENHANCED OIL RECOVERY ACT, CHAVES  
COUNTY, NEW MEXICO

15 TRANSCRIPT OF PROCEEDINGS  
16 Hearing  
17 July 23, 2009  
8:31 a.m.  
18 1220 South St. Francis Drive, Room 102  
Santa Fe, New Mexico 87504

19  
20 BEFORE: TERRY G. WARNELL, HEARING EXAMINER  
21 RICHARD EZEANYIM, TECHNICAL ADVISOR  
BRYAN JAMES, LEGAL ADVISOR

22  
23 REPORTED BY: CONNIE JURADO, RPR, NM CCR #254  
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25

## A P P E A R A N C E S

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BY: WILLIAM F. CARR

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1 MR. WARNELL: We will call Case Number 14341,  
2 application of Armstrong Energy Corporation for approval of  
3 a unit agreement, Chaves County, New Mexico. Call for  
4 appearances.

5 MR. CARR: May it please the Examiner, my  
6 name is William F. Carr, Santa Fe law firm of Holland &  
7 Hart, LLP. We represent Armstrong Energy Corporation in  
8 Case Number 14341. This is a companion case to Case 14342,  
9 and we would request that that case also be called at this  
10 time, and they be consolidated for the purpose of hearing.

11 MR. WARNELL: Okay. And we will also call  
12 Case Number 14342, application of Armstrong Energy  
13 Corporation for approval of a Waterflood Project for its  
14 Round Tank Queen Waterflood Unit Area and qualification of  
15 said project for the recovered oil tax rate pursuant to the  
16 Enhanced Oil Recovery Act, Chaves County, New Mexico.

17 MR. CARR: Mr. Examiner, I have two  
18 witnesses.

19 MR. WARNELL: All right. Any other  
20 appearances?

21 Will the witnesses please stand, state your name,  
22 and be sworn.

23 MR. STUBBS: Bruce A. Stubbs.

24 (Note: Mr. Stubbs was duly sworn.)

25 MR. CARLOZZI: Brian M. Carlozzi.

1 (Note: Mr. Carlozzi was duly sworn.)

2 MR. WARNELL: Mr. Carr, you may call your  
3 first witness.

4 MR. CARR: At this time, Mr. Examiner, we  
5 call Brian Carlozzi.

6 BRIAN MICHAEL CARLOZZI

7 After having been first duly sworn under oath,  
8 was questioned and testified as follows:

9 EXAMINATION

10 BY MR. CARR:

11 Q Would you state your full name for the record,  
12 please?

13 A Yes. Brian Michael Carlozzi.

14 Q Could you spell your last name?

15 A Yes. It's C-A-R-L-O-Z-Z-I.

16 Q And where do you reside?

17 A Roswell, New Mexico.

18 Q By whom are you employed?

19 A Armstrong Energy Corporation.

20 Q And what is your position with Armstrong Energy  
21 Corporation?

22 A Land manager.

23 Q Mr. Carlozzi, have you previously testified before  
24 the New Mexico Oil Conservation Division?

25 A No, I have not.

1           Q     Would you review for the Examiners your  
2     educational background?

3           A     Yes. I graduated with a bachelor of science from  
4     Oklahoma State University in 2002, and subsequent to that, I  
5     completed a master's of business administration. After  
6     college, I worked for two commercial banks primarily as an  
7     analyst and account or commercial account officer in an  
8     energy lending department of Bank of Oklahoma, and I have  
9     since worked as a landman for Armstrong Energy Corporation  
10    since 2005.

11          Q     And Mr. Carlozzi, are you familiar with the  
12    applications filed in these consolidated cases on behalf of  
13    Armstrong?

14          A     Yes.

15          Q     Are you also familiar with Armstrong's plans for  
16    the formation of the unit and Waterflood Project in the  
17    Queen formation in Chaves County, New Mexico?

18          A     Yes.

19          Q     Are you familiar with the status of the lands in  
20    the area that is the subject of this case?

21          A     Yes.

22                   MR. CARR: We tender Mr. Carlozzi as an  
23    expert in petroleum land matters.

24                   MR. WARNELL: Mr. Carlozzi is so qualified as  
25    an expert in land matters.

1 Q (By Mr. Carr) Mr. Carlozzi, would you briefly  
2 summarize for the Examiners what it is that Armstrong Energy  
3 Corporation seeks in each of these cases?

4 A Yes. In Case 14341, we seek approval of the Round  
5 Tank Queen Waterflood Unit, which consists of 1,922.72 acres  
6 of state and federal lands.

7 Q And what about Case 14342?

8 A We seek approval of a Waterflood Project for the  
9 Round Tank Queen Unit Waterflood Project for injection into  
10 the Queen formation. We also seek to qualify this project  
11 for the recovered oil tax rate pursuant to the New Mexico  
12 Enhanced Oil Recovery Act.

13 Q Have you prepared exhibits for presentation here  
14 today?

15 A Yes, I have.

16 Q Would you refer to what has been marked for  
17 identification as Armstrong Exhibit Number 1 and identify  
18 this for the Examiners?

19 A Yes. This is the unit agreement. It is based on  
20 the state/federal waterflood unit form.

21 Q And what is Exhibit 2?

22 A Exhibit 2 is the Exhibit A to this unit agreement,  
23 and it lists the -- or shows a map of the different tracts  
24 within this unit.

25 Q What is the character of the land at issue?

1           A       Currently, the status of the acreage is held by  
2     production. There is one State of New Mexico lease, which  
3     holds 401.6 acres. And there are five federal leases, which  
4     consist of 1521.12 acres. There are no fee leases within  
5     this unit.

6           Q       Let's go to the ownership breakdown that has been  
7     marked as Exhibit Number 3.

8           A       Okay.

9           Q       Could you review this and explain what it shows to  
10    the Examiners?

11          A       It shows the ownership of each of the leases and  
12    tracts in the unit area and identifies Armstrong Energy  
13    Corporation acreage, as well as their related entity, Slash  
14    Exploration Limited Partnership, which Armstrong Energy  
15    Corporation is the general partner for.

16          Q       What is the percentage of the working interest  
17    within the unit area that has been or will be committed to  
18    the unit?

19          A       100 percent.

20          Q       So we have -- if we look at Exhibit 3, Slash and  
21    Armstrong are all part of Armstrong's holdings?

22          A       Yes.

23          Q       And we have the Yates entities, and how are they  
24    going to be brought in?

25          A       Yates Petroleum Corporation has ratified, which we

1 will see in a further exhibit, and the other three Yates  
2 related entities, HEYCO, Yates Energy, and Jalapeno, we are  
3 currently finalizing a conveyance document with them.

4 Q What is the status of the Chase Oil Corporation  
5 acreage?

6 A We have conveyances from not only Chase Oil, but  
7 the other two family members who also have ownership in this  
8 particular lease.

9 Q Would you identify what has been marked as Exhibit  
10 Number 4?

11 A Yes. The preliminary approval letter from the  
12 State Land Office.

13 Q Go back. You're on number --

14 A Okay.

15 Q What is Number 4?

16 A It is the participation or tract participation.

17 Q Let me hand you what has been marked Exhibit 4,  
18 and can you just explain --

19 A That is the ratification from Yates Petroleum  
20 Corporation.

21 Q All right. Mr. Carlozzi, let's go now to Exhibit  
22 Number 5. Would you identify this exhibit?

23 A Yes. That is the preliminary approval letter from  
24 the State Land Office.

25 Q And has the BLM designated this area as an area



1     logically suited for development under the unit plan?

2            A     Yes. It is listed as Exhibit 6.

3            Q     When both the BLM and the State Land Office give  
4     their final approval to the unit, what percentage of the  
5     royalty interest is committed?

6            A     100 percent.

7            Q     Does Armstrong Energy Corporation request to be a  
8     designated operator of the unit?

9            A     Yes, they do.

10          Q     Does the unit agreement provide for periodic  
11     filing of plans of development?

12          A     Yes, it does.

13          Q     And will these plans be filed with the Oil  
14     Conservation Division at the same time they are filed with  
15     the BLM and State Land Office?

16          A     Yes, they will.

17          Q     And how often are they to be filed?

18          A     The initial plan, they will be filed concurrently  
19     with the filing of the unit agreement for final approval  
20     with the State Land Office, BLM, and OCD, and that will also  
21     require us to file subsequent plans prior to the expiration  
22     date of the preceding plan.

23          Q     And how soon are you required under the unit  
24     agreement to commence secondary recovery operation?

25          A     18 months.

1 Q Is Armstrong Exhibit Number 7 an affidavit  
2 confirming notice of this hearing has been provided in  
3 accordance with the rules of the division?

4 A Yes, it is.

5 Q And to whom was notice provided?

6 A Regarding the Waterflood Project, the owner of the  
7 surface of the land on which the well is to be drilled, as  
8 well as all leasehold operators within one-half mile of the  
9 proposed area.

10 Q And as to the unit, all the working interest and  
11 royalty interest owners are committed?

12 A Yes.

13 Q And are those owners identified on pages 26 and 27  
14 of Armstrong Exhibit 11, which we will review later?

15 A Yes, they are.

16 Q Were Armstrong Exhibits 1 through 7 either  
17 prepared by you or compiled at your direction?

18 A Yes, they were.

19 MR. CARR: May it please the Examiners, at  
20 this time, we would move the admission into evidence of  
21 Armstrong Energy Corporation Exhibit Numbers 1 through 7.

22 MR. WARNELL: Exhibits 1 through 7 are  
23 admitted.

24 (Exhibits 1 through 7 admitted.)

25 MR. CARR: That concludes my direct

1 examination of Mr. Carlozzi.

2 MR. WARNELL: Thank you, Mr. Carr. Any  
3 questions? Richard?

4 MR. EZEANYIM: I have a few questions for  
5 you. Go to Exhibit Number 2.

6 THE WITNESS: Okay.

7 MR. EZEANYIM: Clarify for me the land  
8 matter. Which one is the federal and which one is the  
9 state?

10 THE WITNESS: The one state lease is L 729.

11 MR. EZEANYIM: Okay. In color -- I'm color  
12 blind. Which one is --

13 THE WITNESS: I actually don't have the color  
14 one here in front of me.

15 MR. CARR: The color coding, Mr. Examiner, I  
16 believe indicates various ownership working interests, not  
17 the character of the lease. So could you identify what is  
18 the federal tract for Mr. Ezeanyim?

19 THE WITNESS: Yes. It is Tract 7.

20 MR. EZEANYIM: Tract 7 is federal?

21 THE WITNESS: No, it's state. That is Lease  
22 L 729.

23 MR. EZEANYIM: State is L 729?

24 THE WITNESS: Yes.

25 MR. EZEANYIM: Under the BLM, federal?

1 THE WITNESS: All the rest of the tracts.

2 MR. EZEANYIM: Okay. So the color coded are  
3 giving by royalty --

4 MR. CARR: Or by working interest.

5 MR. EZEANYIM: -- or by working interest?

6 THE WITNESS: Yes.

7 MR. EZEANYIM: And then you say that 100  
8 percent are committed, right?

9 THE WITNESS: Uh-huh.

10 MR. EZEANYIM: Okay. No further questions.

11 THE WITNESS: Okay.

12 MR. WARNELL: What is the location -- give me  
13 kind of a feel for where we're at from a nonlocation I guess  
14 it is called now in your area. I'm sure that's on here  
15 someplace, but I don't see it right now. We're in Chaves  
16 County, right?

17 THE WITNESS: Yeah. It is the township and  
18 range closest to the Eddy County line.

19 MR. WARNELL: Okay.

20 MR. CARR: I don't know, Mr. Examiner, if  
21 this will help, but we're 13 miles approximately northwest  
22 of Loco Hills.

23 MR. WARNELL: I see it down here. Okay.

24 Thank you. If there are no other questions for this  
25 witness, you may call your next witness.

1 MR. CARR: Thank you, Mr. Examiner. At this  
2 time, we call Bruce Stubbs.

3 BRUCE ALAN STUBBS

4 After having been first duly sworn under oath,  
5 was questioned and testified as follows:

6 EXAMINATION

7 BY MR. CARR:

8 Q Would you state your name for the record, please?

9 A Bruce Alan Stubbs.

10 Q And where do you reside?

11 A Roswell, New Mexico.

12 Q By whom are you employed?

13 A Armstrong Energy Corporation.

14 Q What is your position with Armstrong Energy  
15 Corporation?

16 A Vice president of operations and engineering.

17 Q Mr. Stubbs, you've previously testified before the  
18 Oil Conservation Division?

19 A That's correct.

20 Q Have you ever testified before Examiners Warnell,  
21 Ezeanyim, or Mr. James?

22 A No, I have not.

23 Q Would you review for them your educational  
24 background?

25 A I graduated from New Mexico State University in

1 1972 with a bachelor of science in mechanical engineering.

2 Q And since that time, for whom have you worked?

3 A I worked nine years for Halliburton Services, six  
4 years for Read & Stevens, a small independent in Roswell;  
5 five years for Hondo Oil and Gas Corporation, and I was a  
6 consultant for about 15 years; and then I've worked for  
7 Armstrong Energy Corporation now for almost three years.

8 Q And in all of those positions, have you worked as  
9 a petroleum engineer?

10 A Yes.

11 Q Are you familiar with the applications filed in  
12 these consolidated cases?

13 A Yes, I am.

14 Q And are you familiar with Armstrong's plans to  
15 form a unit and implement a Waterflood Project in Chaves  
16 County, New Mexico?

17 A Yes.

18 Q Did you prepare the C-108, the application in this  
19 case?

20 A Yes, I did.

21 MR. CARR: We tender Mr. Stubbs as an expert  
22 witness in petroleum engineering.

23 MR. WARNELL: Usually, Richard has a question  
24 at this time. Mr. Stubbs, when you were a consultant, were  
25 you a consulting petroleum engineer?

1 THE WITNESS: Yes. I am a registered  
2 professional petroleum engineer in New Mexico and Texas.  
3 Primarily did --

4 MR. WARNELL: Thank you for sharing that.  
5 That is usually Mr. Ezeanyim's question. We took care of  
6 that. Mr. Stubbs is so qualified.

7 Q (By Mr. Carr) Mr. Stubbs, I think initially it  
8 would be helpful if you could just identify what horizons  
9 are being unitized in the proposed Round Tank Queen  
10 Waterflood Unit.

11 A Just the Queen formation.

12 Q And that is the only formation that you're going  
13 to be conducting the secondary recovery operation --

14 A That's correct. It's about a 16-foot thick sand  
15 package.

16 Q Let's go to what has been marked Armstrong Exhibit  
17 Number 8, your technical study.

18 A Okay.

19 Q And I would ask you to, I think, work through this  
20 and review for the Examiners the technical basis for this  
21 proposal.

22 A Okay.

23 MR. EZEANYIM: Which exhibit are you talking  
24 about now?

25 MR. CARR: It is Exhibit 8.

1 THE WITNESS: The Round Tank Queen Associated  
2 Pool --

3 MR. CARR: Wait just a minute.

4 MR. EZEANYIM: Go ahead.

5 Q (By Mr. Carr) Okay. Proceed.

6 A The Round Tank Queen Associated Pool was  
7 established in March of 1970 with the discovery well, the JW  
8 State #1 in Unit K of Section 30 of 1529. To date, there  
9 has been nine wells that have produced out of the Queen in  
10 the Round Tank field. Cumulative production is  
11 26,000 barrels of oil and almost 4.2 BCF of gas.

12 The map indicates the location of those wells on  
13 page 1. Page 2 is -- at the top of the page is a summary of  
14 the wells and their production, total depths, and where they  
15 were perforated. And you can see, this field was primarily  
16 a gas field with a minor amount of oil being produced.

17 At the bottom of the page is a declined curve or  
18 the production in that field since 1970. The gas is a  
19 little -- BTU gas. It is 61 percent nitrogen and 39 percent  
20 hydrocarbons with a BTU content of about 513 BTUs per cubic  
21 foot.

22 Q Mr. Stubbs, this is a historic production pod; is  
23 that correct?

24 A Yes, that's correct.

25 Q The projection of which you anticipate to obtain



1 from the Waterflood Project will be presented later?

2 A That's correct.

3 Q All right. Let's go to page 3.

4 A Page 3, at the top of the page is just a cartoon  
5 that shows the location of the gas cap in relation to the  
6 wells that are produced out of the gas cap. The bottom of  
7 the page is really not too important at this point. On page  
8 4 at the bottom, go through the volumetrics to calculate the  
9 area of the gas cap, and it covers about 2,466 acres, so  
10 approximately four sections.

11 On page 5 is another carton showing the  
12 approximate location of an oil leg. The Christine Federal  
13 #3 has produced about 14,000 barrels of oil out of this oil  
14 leg, and it sits in probably the best position for oil  
15 production. It is just below the gas cap and just above the  
16 water.

17 The gas cap is at plus 2219, and the oil/water  
18 contact is at plus 2211, so there is an 18-foot oil column  
19 in this little field, little rim of oil around this field.  
20 To date, the Christine Federal #3 has not produced formation  
21 water, so the water drive is not active. It doesn't have  
22 any energy in it.

23 Q Well, where is the -- could you point out the  
24 Christine Federal #3?

25 A Christine Federal #3 is located in Section 30,

1 Unit B. It's the one that has 14,579 barrels of oil.

2 Q What is on page 6?

3 A Page 6 is a computer generated structure map of  
4 the Queen formation. The Queen sand is about two miles  
5 wide. It runs north to south. It dips from west to east at  
6 about 75 feet per mile. There is a nice, little nose that  
7 is right on the section line between Sections 19 and 30, and  
8 that's where the Christine Federal #3 is located. That's  
9 where most of the oil productions come from.

10 Q Page 7.

11 A It's a little hard to see on this page, but the  
12 dark shaded area is the oil column in relation to the --  
13 this is -- what I use this for is a volumetric model, so  
14 this identifies the oil column as it goes through the  
15 sections.

16 Q Page 8, would you review that?

17 A Page 8 is a type log. We're quite fortunate, Mack  
18 Energy has drilled a bunch of San Andres wells in the area,  
19 so we now have some good modern logs, and this is a typical  
20 log. There's a -- in just about every well out there,  
21 there's a bottom sand with about six feet of good porosity  
22 ranging from 18 to 22 percent, and then there is a top sand  
23 with three to four feet of porosity ranging from about 15 to  
24 18 percent.

25 Q The sand is continuous across the unit area?

1           A     Yes. And that's what I tried to show at the  
2 bottom of the page. It's a little small, but the sands are  
3 continuous over the unit area.

4           Q     Go ahead. What is shown on page 9 and 10?

5           A     Page 9 shows the oil column as it runs through the  
6 unit area, and page 10 is just showing the thickness of the  
7 oil column. If you can imagine a trapezoidal shape, the oil  
8 column it is about 18 feet thick, and it's about a quarter  
9 to half a mile wide.

10          Q     Would you go to page 11 and explain what that  
11 shows?

12          A     We -- to come up with unit interests per each  
13 tract, really the only two things we had to consider were  
14 the acreage being contributed and the original oil in place  
15 number for each tract. So that's what I have done here is  
16 calculated original oil in place for each tract. There's --  
17 calculates 1.684 million barrels of oil in place in that oil  
18 rim.

19          Q     And all the working interest owners have agreed to  
20 this tract participation?

21          A     Yes, that's correct.

22          Q     What is page 12?

23          A     I think you've already seen this. This is the  
24 tract map showing the different tracts.

25          Q     If we go to now page 13, you talk about basically

1 four development phases. Could you explain those to the  
2 commission and what you mean by each of those phases?

3 A Well, phase I or step I is a pilot project. We're  
4 going to drill an injection well east of the Christine #3  
5 and another producing well west of the Christine #3. We're  
6 going to core the producing well and take that core and do  
7 basic core analysis, but also do some displacement studies  
8 and saturation studies on that core to determine the  
9 feasibility of the waterflood.

10 In the meantime while we're evaluating the core,  
11 we will start injection into the injection well and use the  
12 Christine #3 as our monitor well to see what kind of  
13 response we get. Once we have that data, we will do a full  
14 field reservoir simulation study. And using that study, we  
15 will pick our locations for additional injection wells and  
16 producers.

17 Q When you use the term "phase," you're not talking  
18 about distinct, separate, operational phases, are you?

19 A No, it's just development stages basically.

20 Q And to go through all of the phases, what sort of  
21 a time frame are you anticipating it would take?

22 A We're talking probably six months for the first  
23 step, a year for the second step, and then the third step,  
24 so everything should be completed in two years.

25 Q After you go through the first step or phase, you

1 will then make your plans for the further development of  
2 this unit area?

3 A That's correct. Using the reservoir simulation  
4 model, we will be able to pick our well locations.

5 Q And does Armstrong request that the order entered  
6 in this case provide for administrative procedure whereby  
7 you can add additional injection wells to the unit  
8 administratively without the necessity of --

9 A Yes, we request that.

10 Q Now, if we look at page 14, and we talk about well  
11 construction and the area of review. This information  
12 actually relates to the C-108 application, does it not?

13 A That's correct.

14 Q So why don't we skip that and come back to -- we  
15 will get to that.

16 A Okay.

17 Q Go to page 16. What is this?

18 A 16 is a structure map just using subsea depths,  
19 and it agrees with our computer generated map. The map on  
20 page 17 is an isopach map showing sand thickness. And as  
21 you can see, it is fairly uniform. There's a couple of  
22 little pods that are ten feet thick, but the majority of the  
23 net sands are 68 feet thick. And it is bounded on the east  
24 by a porosity pinch-out, and it is also bounded on the west  
25 with another porosity pinch-out.

1           So the sand is about two miles wide. We know it  
2   is at least two miles long. There is not much well control  
3   to the north or the south, so we're not real sure exactly of  
4   the extent north and south. If you look at some of the  
5   analogue fields, like the South Lucky Lake and Sulimar, they  
6   are two or three times as long as they are wide. So this  
7   may extend farther north and south.

8           On page 18, it's just showing our best guess of  
9   well locations at this time. There would be a line of  
10  injectors along the down dip side, and a line of producers  
11  along the up dip side of the oil column.

12          Q   And this last page is basically your estimate at  
13  this time of what full unit development would look like in  
14  this pool with the full waterflood implemented?

15          A   That's correct.

16          Q   And these locations will be re-evaluated and  
17  possibly adjusted after you get your initial --

18          A   That's correct.

19          Q   Let's go to what has been marked Armstrong Exhibit  
20  Number 9. Would you identify that, please?

21          A   That is our C-108 application for injection well  
22  in Unit Letter A of Section 30, 15, 29.

23          Q   Does this C-108 contain all information required  
24  by Form C-108?

25          A   Yes, it does.

1 Q And has this application been provided to all  
2 effected parties?

3 A Yes, it has.

4 Q Is this an expansion of an existing project?

5 A No, this is a new project.

6 Q Mr. Stubbs, let's go -- and I tried to number  
7 these pages, but they didn't copy very well. Let's go to  
8 page 5, I believe, which is the area of review map.

9 A Okay.

10 Q Would you refer to this map and review the status  
11 of the development in this area for the Examiners?

12 A Okay. The well we're proposing to drill and make  
13 an injector is located in Unit Letter A of Section 30, and  
14 that is where the radius starts. You will notice a lot of  
15 locations circled on there. That's Mack Energy's San Andres  
16 wells that he has been drilling. He has drilled to date  
17 probably ten to 12 of those wells. And by the time we  
18 finish this meeting, he may have a couple more drilled. He  
19 has been pretty active out there drilling San Andres wells.

20 You've already seen a map showing the Queen wells.  
21 There's nine Queen wells in there. Back in the '50s, late  
22 '50s, early '60s, he drilled a few San Andres wells and  
23 attempted to produce the San Andres, but were not real  
24 successful, so there's some old San Andres wells in the  
25 area, also. And there is also one deep Devonian test

1 located in Unit Letter D of Section 30, and Mack Energy has  
2 just drilled a Devonian disposal well in Unit Letter K of  
3 Section 19.

4 Q And the circles on this exhibit are the one-half  
5 mile area of review?

6 A That's correct.

7 Q And then just a circle indicating all tracts,  
8 acreage, and wells that would be located within two miles of  
9 the proposed injection well?

10 A That's correct.

11 Q Let's go to the page -- the following pages, 6  
12 through 8 of Exhibit Number 9, and I would ask you to  
13 explain what those show.

14 A These are the wells within a half mile radius of  
15 review, giving location, TDs, spud dates, completion dates,  
16 latitude and longitude. On the second page, page 7, is the  
17 casing and cementing detail. On page 8 is the perforation  
18 and completion detail on each one of the wells.

19 Q Do these three pages contain all information on  
20 wells within the area of review that penetrate the injection  
21 zone that is required by Form C-108?

22 A Yes, it does.

23 Q Let's look at the next pages, pages 9 through 18.

24 MR. EZEANYIM: Before you do that, do you  
25 have the status of these wells? I am trying to find the



1 status of both wells in the area of review. Do you have  
2 them?

3 THE WITNESS: What's that? The --

4 MR. EZEANYIM: The status of the wells in the  
5 area of review.

6 THE WITNESS: Yeah, the third, fourth column,  
7 status, they are either P and A, producing, or they are new  
8 location.

9 MR. CARR: On page 6.

10 THE WITNESS: Page 6.

11 MR. EZEANYIM: L-O-C meaning what?

12 THE WITNESS: It's a new location. It hasn't  
13 been drilled yet. It's been proposed and permitted.

14 MR. EZEANYIM: Is that going to be a producer  
15 or injector?

16 THE WITNESS: I'm sorry?

17 MR. EZEANYIM: Is that going to be a producer  
18 or injector?

19 THE WITNESS: It is one of Mack Energy's. It  
20 will be a San Andres producer. San Andres is about  
21 3,100 feet.

22 MR. EZEANYIM: Thank you.

23 Q (By Mr. Carr) Mr. Stubbs, let's go to pages 9  
24 through 18. What are these?

25 A These are diagrams of the wells that we have .

1 identified in the half mile radius.

2 Q Do these include the plugged and abandoned wells  
3 that were on that list you just pointed out to Mr. --

4 A Yes, this is the plugged and abandoned wells.

5 Q Do they contain all plugging detail for each of  
6 these wells?

7 A These are all the ones I could find in the  
8 records.

9 Q I would like to direct your attention to the  
10 Federal A #1 well.

11 A That is on page number 12. The copies may be a  
12 little light, but the -- this well is -- it's not plugged  
13 like I would like it to be plugged.

14 MR. EZEANYIM: Which one?

15 THE WITNESS: On page 12, Federal A #1.

16 MR. CARR: Roman numeral VI-7.

17 MR. EZEANYIM: Okay. There is no plug in  
18 information there.

19 THE WITNESS: Well, they set a 35 sack plug  
20 from 2,100 to 2,000, and open hole up to the casing shoe,  
21 and there is a 35 sack plug set across the casing shoe. So  
22 there is open hole from just below the casing shoe to 2,000  
23 feet. The Queen zone is about 1,600 feet as I've  
24 highlighted there.

25 Q (By Mr. Carr) How do you recommend this well be

1 handled?

2 A Well, if you go back to Exhibit 8 I believe it was  
3 on page 14, there is a copy of the log.

4 Q Just a second. Let's get that out.

5 MR. WARNELL: Page 8 did you say?

6 A Page 14, Exhibit 8. This well lies east of the  
7 porosity pinch-out, and the log indicates that the porosity  
8 is very low. So while I'm concerned, I don't think it is a  
9 big problem. This well probably is not conductive of  
10 fluids, so I don't think we're going to have a problem with  
11 losing water into this wellbore.

12 Q (By Mr. Carr) Would you recommend that the order  
13 entered in this case provide that Armstrong should meet with  
14 the OCD's District Office in Artesia to determine if  
15 remedial work is required, and if so, what that should be  
16 prior to injection?

17 A I would recommend that, yes.

18 Q Let's go to pages -- I believe it is pages 3 and  
19 4, but Exhibit 9, the well data sheets for the proposed  
20 injection well. And working from pages 3 and 4, would you  
21 review for the Examiners how Armstrong proposes to actually  
22 complete the injection well?

23 A The surface hole will be an 11-inch hole, drilled  
24 to the Rustler anhydrite at about 150 feet.

25 MR. EZEANYIM: Which page are you talking

1 about now?

2 THE WITNESS: Page 3 in Exhibit 9.

3 MR. CARR: The C-108, the third page.

4 THE WITNESS: It's the injection well data  
5 sheet.

6 MR. EZEANYIM: We're going back --

7 MR. CARR: Yes, we jumped back.

8 MR. EZEANYIM: The third page?

9 MR. CARR: Yes, sir.

10 MR. EZEANYIM: Okay.

11 THE WITNESS: We will drill an 11-inch hole  
12 --

13 MR. EZEANYIM: This is the injection well?

14 THE WITNESS: This is the injection well,  
15 yes. We will drill an 11-inch hole to approximately  
16 150 feet into the Rustler anhydrite, set 8 5/8" casing and  
17 circulate cement on that string, and then drill a 7 7/8"  
18 hole to approximately 1,600 feet and set 5 1/2" casing and  
19 run enough cement to circulate. Sometimes they don't  
20 circulate due to some loss of circulation or washouts in  
21 those holes, but we will attempt to circulate it.

22 And then after we move the rig off, we will move  
23 in a completion unit, perforate the interval from  
24 approximately 1575 to 1590. Acidize it, clean it up, and  
25 frac it with a small 20,000-gallon frac treatment with about

1 20,000 pounds of sand, and then run a plastic coated packer  
2 and internally plastic coated tubing to complete the well.

3 Q (By Mr. Carr) Will the annulus space be filled  
4 with a fluid?

5 A We will fill the annulus with packer fluid with  
6 corrosion inhibitor and then run an MIT test to make sure  
7 the casing and packer are holding.

8 Q Will you pressure test the fluid in the annulus as  
9 required through the Federal Underground Injection Control  
10 Program?

11 A Yes, we will.

12 Q And Mr. Stubbs, we are proposing to inject into  
13 the Queen. How thick an interval are we actually talking  
14 about? What are the perforations?

15 A Like I said, the perforations are going to be  
16 approximately 1575 to 1590.

17 Q So our net thickness is --

18 A 15 or 16 feet.

19 Q What is the average porosity?

20 A Average porosity is about 18 percent.

21 Q And the estimate of the permeability in this area?

22 A Those sands are very high permeability. Anywhere  
23 from 100 to 500 millidarcies.

24 Q And you've indicated there is San Andres  
25 production in the area. Mack Energy is now developing. Are

1     there any other oil productive zones in the immediate area?

2             A     No, there is not.

3             Q     And what is the source of the water that you're  
4     proposing to inject into the subject well?

5             A     We will be using San Andres water from Mack's  
6     wells. He has quite a bit of water production now from  
7     those wells.

8             Q     And what volumes do you propose to inject?

9             A     A rough estimate now is about 100 barrels per day  
10    per injection well.

11            Q     What would be your maximum injection?

12            A     Probably not over 200 barrels a day per well.

13            Q     Will this be a closed system?

14            A     Yes, it will.

15            Q     And you will be injecting under pressure?

16            A     Yes.

17            Q     And what pressure does Armstrong anticipate using?

18            A     Initially, 100 pounds, and probably not exceeding  
19    200 pounds.

20            Q     These pressure limits fall below the 2/10 pounds  
21    per foot of depth to the top of the injection interval that  
22    the Oil Conservation Division generally uses?

23            A     That's correct, 2/10 of a PSI per foot would be  
24    300 PSI.

25            Q     If you need to go above 300 PSI, will Armstrong

1     justify the increase in pressure with separate tests  
2     witnessed by the division?

3           A     Yes, we would.

4           Q     Are there fresh water zones in the area?

5           A     No, there is not.

6           Q     Could you refer to -- I believe it is pages 23 and  
7     25 of the C-108, and identify the water analyses that are  
8     contained on those pages?

9           A     Page 23 is a water analysis from the Queen zone  
10    out of the J.W. State #1, and it is typical Queen water for  
11    this area. It is fairly high chlorides, 159,000; 9,600  
12    magnesium; 5,900 calcium.

13           Page 24 is some water analysis we obtained off of  
14    Mack Energy's wells and --

15          Q     And this is a San Andres well?

16          A     This is San Andres water. The chlorides are  
17    anywhere from 70- to almost 90,000, which is fresher water,  
18    if you would, than the Queen water.

19          Q     Do you anticipate any compatibility problems  
20    injecting the San Andres water into the Queen?

21          A     There's a slight tendency toward calcium carbonate  
22    scale, and we think we can control that with inhibitors.

23          Q     Okay. Have you examined the available geological  
24    engineering data available on the Queen formation in this  
25    area?

1           A     Yes, I have.

2           Q     And as the result of that examination, have you  
3     found any evidence of open faults or other hydrologic  
4     connections between the injection zone and any underground  
5     source of drinking water?

6           A     No, I have not.

7           Q     Mr. Stubbs, let's now go to what has been marked  
8     Armstrong Exhibit 10. Would you identify that, please?

9           A     This is our application in Case 14342 for approval  
10    of a Waterflood Project for its Round Tank Queen Waterflood  
11    Unit area and qualification of said project for the  
12    recovered oil tax rate pursuant to the Enhanced Oil Recovery  
13    Act in Chaves County, New Mexico.

14          Q     Let's go to that form, and I have asked you to --  
15    or that letter and identify for the Examiners what you  
16    estimate the additional capital costs to be for this  
17    project.

18          A     We estimate the capital costs at \$4.95 million.

19          Q     And are those the total project expansion costs?

20          A     Yes, at this time, that's our best estimate.

21          Q     How much additional production does Armstrong  
22    expect to obtain from this project?

23          A     We hope to obtain at least 20 percent of the  
24    original oil in place, which would be 320,000 barrels.

25          Q     What is the estimated value of this additional



1 production?

2 A It would be \$20,800,000.

3 Q And what are you basing that on?

4 A At \$65 a barrel.

5 Q If this project is economically successful, does  
6 Armstrong plan to expand the project?

7 A Yes, that is our intent.

8 Q If we look at the attachments to your letter  
9 application, what is Exhibit A?

10 A This is -- the shaded area in yellow is the unit  
11 outline on the land plat.

12 Q And Exhibit B?

13 A This is the type log from the Eskimo State #2  
14 well.

15 Q And this is the type log that you previously  
16 discussed?

17 A Yes.

18 Q Exhibit Number C?

19 A This is the same map we had on Exhibit Number 8  
20 with the location of the Queen wells and the production from  
21 the Queen wells.

22 Q What is Exhibit D?

23 A D is the historic production history of the well  
24 up until mid 2009 and then our projected production from the  
25 waterflood.

1 Q Mr. Armstrong, does -- Mr. Stubbs, does Armstrong  
2 request that the unit order in this case be expedited?

3 A Yes.

4 Q How soon do you anticipate actually drilling an  
5 injection well?

6 A We're trying to get ready to start drilling about  
7 mid October -- or mid August, I mean.

8 Q So it would be important to have the unit portion  
9 of these applications in place by the 1st of August?

10 A Yes, it would.

11 Q In your opinion, would approval of this  
12 application and the implementation of its proposed  
13 waterflood be in the best interest of conservation,  
14 prevention of waste, and the protection of correlative  
15 rights?

16 A Yes, it would.

17 Q Were Armstrong Exhibits 8 through 10 prepared by  
18 you or compiled under your direction?

19 A Yes, they were.

20 MR. CARR: And may it please the Examiners,  
21 at this time, we would move the admission into evidence of  
22 Armstrong Energy Corporation Exhibits 8 through 10.

23 MR. WARNELL: Exhibits 8 through 10 are  
24 admitted.

25 (Exhibits 8 through 10 admitted.)

1 MR. CARR: Mr. Examiner, I also have prepared  
2 a proposed order which addresses the unit part of the case  
3 that I will submit also by e-mail. It is, to the best of my  
4 ability, the most recent -- conforms with the most recent  
5 order entered by the division, and because we have requested  
6 that this part of the applications be expedited, we do have  
7 a proposed order for you. If I may present them to you at  
8 this time?

9 MR. WARNELL: Yes.

10 MR. CARR: And that concludes my direct  
11 examination of Mr. Stubbs.

12 MR. WARNELL: Thank you. Mr. Stubbs, that  
13 was a lot of material we went over. Unfortunately, I did  
14 not write down all of my questions, but I would like to go  
15 back to this type log that we just looked at.

16 THE WITNESS: Okay.

17 MR. WARNELL: That is a nice, legible log.  
18 What is going on with the gamma ray there? Why is that  
19 gamma ray so hot?

20 THE WITNESS: The Queen is typically a  
21 radioactive sand.

22 MR. WARNELL: And do you run just a standard  
23 gamma ray or do you run a spectral gamma ray or anything?

24 THE WITNESS: This is just a standard gamma  
25 ray.

1 MR. WARNELL: How long does it take you to  
2 drill a 1,600 foot well?

3 THE WITNESS: Not long. You wait on cement  
4 longer than you spend drilling. Three or four days.

5 MR. WARNELL: Questions, Richard?

6 MR. EZEANYIM: Why do you want this order in  
7 a hurry?

8 MR. CARR: We need the order because a unit  
9 agreement can only be effective on the first day of the  
10 month following approval from the landowners. The Land  
11 Office conditioned their approval on the order on the unit  
12 from the OCD. So to have the unit part in place -- we're  
13 not in a hurry on the rest of it, but to have the unit in  
14 place by August 1, the Land Office won't give us that until  
15 we get the unit order from you. So that's the only reason  
16 for having to push that part of it like that.

17 MR. EZEANYIM: What is the primary recovery  
18 factor in this lease? Do you have an idea? I know we went  
19 5 through 8.

20 THE WITNESS: Well, this lease is -- this  
21 little project is somewhat unique because we have very  
22 little primary production. We have only produced to date  
23 about 1 1/2 percent of the original oil in place. Most of  
24 the Queen fields in the area have about 20 percent primary  
25 production. And most of them have about another 20 percent

1 on secondary, so they recover somewhere around 40 percent of  
2 the oil in place.

3 This is a little different because we haven't  
4 produced any -- very little primary production. So our  
5 models that we have right now, the simulation we have right  
6 now indicates that we will get at least 23 percent of the  
7 original oil in place. If we can do a little better job on  
8 the waterflood, we may get a higher number than that.

9 MR. EZEANYIM: I'm not sure that you are  
10 starting this very early in the life of the well without  
11 allowing this to include primary production.

12 THE WITNESS: Well, right now there is no  
13 bottom hole pressure. The gas cap has been depleted. There  
14 is no pressure in the water leg or the oil column. There is  
15 very little solution gas in the oil. Like I said before,  
16 the gas -- the content -- the nitrogen content of the gas  
17 cap is about 60 percent, and so there is very little  
18 hydrocarbon gas to be put into solution. Now, the pressure  
19 is about 60 BSI, so all the gas is moved out of the oil  
20 column. There is no reservoir energy.

21 MR. EZEANYIM: Good -- okay. I like this  
22 project. If you go to the producer well, if you are going  
23 to produce water from the San Andres and inject it into the  
24 Queen --

25 THE WITNESS: That's correct.

1 MR. EZEANYIM: -- what are the compatibility?  
2 I know you talked about it. What are the compatibility in  
3 the --

4 THE WITNESS: It appears to be compatible.  
5 There is a slight tendency towards scaling. We think we can  
6 control that with inhibitors.

7 MR. EZEANYIM: Are you going to be using a  
8 line drive there?

9 THE WITNESS: It is basically a line drive.  
10 It is a little bit -- I think it's going to end up being a  
11 little different than a line drive because we're going to  
12 move the injectors back away from the oil column a little  
13 ways to get the pressure to be more uniform across the oil,  
14 oil front.

15 MR. EZEANYIM: We don't know what the oil  
16 price is going to do, you know. I think using the oil price  
17 of \$65 is kind of already maybe high now.

18 THE WITNESS: It has been \$65 for a couple of  
19 days now.

20 MR. EZEANYIM: You hope to recover an  
21 additional 20 percent at least?

22 THE WITNESS: Yeah, that's what we  
23 anticipate.

24 MR. EZEANYIM: That's good. No further  
25 questions.

1 MR. WARNELL: Mr. Stubbs, I have got -- I  
2 thought for sure that Mr. Ezeanyim would ask about that  
3 Federal A #1 well.

4 THE WITNESS: Yes, sir.

5 MR. WARNELL: Looking at your -- this page  
6 here right now.

7 THE WITNESS: Okay.

8 MR. WARNELL: I think it is C-108 about  
9 halfway through.

10 THE WITNESS: Yeah, page 12. Uh-huh.

11 MR. WARNELL: Yeah. That well concerns me,  
12 too, a bit. You don't suppose that could be a deal breaker,  
13 do you?

14 THE WITNESS: No. I mean, if we get to the  
15 point that nobody is happy with it, we will try to re-enter,  
16 replug it. But I really -- I don't like the way it is  
17 plugged either, but I don't have a lot of heartache over it  
18 because the zone is so tight. We just don't have any  
19 porosity.

20 MR. WARNELL: Have you talked with the people  
21 at Artesia yet, or do you intend to do that?

22 THE WITNESS: I intend to do that before we  
23 start injection.

24 MR. WARNELL: No more questions.

25 MR. CARR: That concludes our presentation in

1     this case.

2                     MR. WARNELL: Thank you, Mr. Carr. We will  
3     take Case Number 14341 and 14342 under advisement. It looks  
4     like it's about 9:20. Let's take a ten-minute break, and we  
5     will start again at 9:30.

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## REPORTER'S CERTIFICATE

I, CONNIE JURADO, do hereby certify that I reported the foregoing case in stenographic shorthand and transcribed, or had the same transcribed under my supervision and direction, the foregoing matter and that the same is a true and correct record of the proceedings had at the time and place.

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 whatsoever in the final disposition of this case in any court.

WITNESS MY HAND this 23rd day of July, 2009.

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Connie Jurado, CCR, RPR  
New Mexico CCR No. 254  
Expires: December 31, 2009