

ENVIRONMENTAL PROTECTION AGENCY
REGION 6

2011 DEC -6 AM 9:27

1
2 IN THE MATTER OF)
3 ALTEC PETROLEUM GROUP, INC.)
4 PAWHUSKA, OKLAHOMA)
5 RESPONDENT)

REGIONAL HEARING CLERK
EPA REGION VI
DOCKET NO. 06-2008-1832

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7 -----
8 HEARING OF
9 MATTHEW RUDOLPH
10 NOVEMBER 16, 2011
11 -----

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16 HEARING OF MATTHEW RUDOLPH, produced as a witness
17 at the instance of the Agency and duly sworn, was taken
18 in the above-styled and numbered cause on November 16,
19 2011, from 9:12 a.m. to 10:49 a.m., before Donna
20 Trotman, CSR in and for the State of Texas, reported by
21 machine shorthand, at the Environmental Protection
22 Agency Office, 1445 Ross Avenue, 13th Floor Hearing
23 Room, Dallas, Texas, pursuant to the Texas Rules of
24 Civil Procedure and the provisions stated on the record
25 or attached hereto.

A P P E A R A N C E S

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3 FOR THE AGENCY:

4 Ms. Lorraine Dixon
5 ENVIRONMENTAL PROTECTION AGENCY
6 1445 Ross Avenue
7 [!ADDRESS-B1]
8 Dallas, Texas 75202

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FOR THE RESPONDENT, ALTEC PETROLEUM GROUP, INC.

Mr. Patrick Adams, Pro Se

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1 P R O C E E D I N G S

2 THE COURT: Okay. We'll start now. We're
3 here today for a hearing in the matter of Altec
4 Petroleum Group, Incorporated, docket number 06-2008-
5 1832. This is a clean water act section or class one
6 penalty action. Liability has already been established
7 in accelerated determination. The purpose of the
8 hearing today is to take evidence on an appropriate
9 penalty amount.

10 The government is represented by
11 Ms. Lorraine Dixon here today. And Mr. Patrick Adams,
12 the CEO of Altec Petroleum, is representing Altec.

13 Ms. Dickson, would you like to make an
14 opening statement of any sort?

15 MS. DIXON: Your Honor, before we proceed,
16 I have a little housekeeping matter in regards to the
17 original copies.

18 THE COURT: Please come up here closer so
19 Mr. Adams can hear you on the speaker phone.

20 MS. DIXON: Sure. Of course. In regards
21 to the original copies that I am prepared to offer into
22 evidence, would you like me to give those to the court
23 reporter or to you?

24 THE COURT: Interesting. We can certainly
25 -- these are going to be exhibits to the transcript?

1 MS. DIXON: Yes.

2 THE COURT: You may give those to the court
3 reporter, file a copy for the record.

4 MS. DIXON: Okay. And I do have a copy for
5 you, Mr. Adams. I will make sure that it gets mailed
6 today.

7 THE COURT: Are these -- are these the same
8 exhibits that were exchanged?

9 MS. DIXON: Yes. But I won't be offering
10 all of them.

11 THE COURT: Okay. I believe that most of
12 them are already in the record in any event.

13 MS. DIXON: Okay. And the other matter is,
14 I need to do a Motion To Amend The Complaint.

15 THE COURT: Proceed.

16 MS. DIXON: Your Honor, at this time, the
17 Complainant would like to make a motion to amend the
18 complaint. The purpose of the motion is to correct a
19 penalty that after the witness reviewed, he found there
20 to be an error and the effort proposed penalty is
21 included in the amended complaint.

22 We do not believe that it will cause
23 prejudicial harm to the Respondent as it is a lower
24 amount. Initially, the proposed penalty was 19,700 --
25 I'm sorry \$500 -- and today we will be seeking a penalty

1 of 14,400.

2 THE COURT: Mr. Adams, do you have any
3 objection to what the penalty of amount being reduced
4 that way?

5 MR. ADAMS: No, sir. I didn't exactly hear
6 all that. I apologize.

7 THE COURT: Oh. Well, let me -- Ms. Dixon
8 just made a motion to reduce the penalty amount that the
9 government is seeking from \$19,500 to \$14,400. It
10 requires consent of the judicial officer to amend the
11 claimant that way in this matter because it will be her
12 second amendment.

13 But she argues that it will not prejudice
14 you, and I think that's pretty persuasive, but do you
15 have any objection to the government seeking a lower
16 penalty against you?

17 MR. ADAMS: No, sir.

18 THE COURT: Okay. Then your motion is
19 granted, Ms. Dixon.

20 MS. DIXON: Thank you.

21 THE COURT: Since Mr. Adams is participating
22 by speakerphone here, be sure to come up here close to
23 the phone so he can hear it all.

24 MS. DIXON: Is it okay for me to stand
25 here?

1 THE COURT: Yes. You can move even further
2 up there if you like.

3 MS. DIXON: Mr. Adams, let me know if you
4 can't hear me.

5 MR. ADAMS: Oh, I hear your great now.
6 Thank you.

7 MS. DIXON: Okay. My name is Lorraine
8 Dixon. I represent the Complainant, the United States
9 Environmental Protection Agency, and I will waive
10 opening statement.

11 THE COURT: All right. Proceed then with
12 your witness, Ms. Dixon.

13 MS. DIXON: Your Honor, at this time, I
14 call up Matthew Rudolph.

15 MATTHEW RUDOLPH,
16 having been first duly sworn, testified as follows:

17 EXAMINATION

18 BY MS. DIXON:

19 Q. Could you state your name for the record?

20 A. Matthew Thomas Rudolph.

21 Q. And where are you employed?

22 A. EPA -- or Environmental Protection Agency,
23 Region 6, Dallas, Texas.

24 Q. And how long have you been with EPA?

25 A. Approximately 8 1/2 years.

1 Q. And what does your job duties entail?

2 A. My job title is as an enforced -- or
3 environmental engineer. My job duties would include
4 that of an enforcement officer and as an inspector.

5 THE COURT: Pardon me for interrupting, Ms.
6 Dixon. Mr. Rudolph, if you could just scootch around
7 here, I can probably hear you better than the speaker
8 phone. There you go.

9 Q. (BY MS. DIXON) As part of your job duties, did
10 you have the opportunity to hear about the facility
11 named Altec Petroleum Group, located in Osage County,
12 Oklahoma?

13 A. Yes.

14 Q. Do you have personal knowledge of a Section 9
15 -- Section 309(g), Clean Water Act complaint that was
16 filed by EPA against Altec Petroleum Group?

17 A. Yes.

18 Q. How so?

19 A. I was the enforcement officer on that case.

20 Q. Are you aware of the allegations made in the
21 complaint?

22 A. Yes.

23 Q. And what were those allegations?

24 A. Allegations were Clean Water Act violations,
25 the unauthorized discharge of a pollutant, being oil

1 fill brine, to a -- waters of the U.S.

2 Q. And how many allegations did you make of this
3 particular violation?

4 A. Two.

5 Q. Did you calculate the penalty in the complaint
6 against Altec Petroleum Group?

7 A. Yes.

8 Q. And what is the proposed penalty that EPA is
9 seeking today at this hearing?

10 A. \$14,400.

11 Q. And, Mr. Rudolph, let's take a moment and go
12 through the penalty calculation. Did you use anything
13 to help assist you in calculating the proposed penalty?

14 A. Yes.

15 MS. DIXON: Permission to approach the
16 witness, Your Honor.

17 THE COURT: Certainly. You're going to
18 have to approach him pretty closely just for the speaker
19 phone to pick you up.

20 MS. DIXON: Right.

21 (Exhibit 1 marked.)

22 Q. (BY MS. DIXON) Mr. Rudolph, I'm showing you
23 what has been marked as Government's Exhibit 1. Do you
24 recognize this document?

25 A. Yes.

1 Q. And what is it?

2 A. It's the Clean Water Act Settlement Penalty
3 Policy.

4 Q. How do you recognize this document?

5 A. I've used it.

6 Q. Did you use it in this particular case?

7 A. Yes, I did.

8 Q. And is this a fair and accurate representation
9 of the Clean Water Act Settlement Policy that you used
10 to assess the penalty in this case?

11 A. Yes.

12 MS. DIXON: Your Honor, at this time I
13 offer Exhibit 1 into evidence.

14 THE COURT: Do you have any objection to
15 that, Mr. Adams?

16 MR. ADAMS: No, sir.

17 THE COURT: All right.

18 Q. (BY MS. DIXON) In addition to the Clean Water
19 Act Settlement Policy, you mentioned that you also used
20 Section 309 of the Clean Water Act statute?

21 A. Yes.

22 Q. Does Section 309 of the Clean Water Act have a
23 statutory maximum penalty?

24 A. Yes.

25 Q. Did you calculate a statutory maximum penalty

1 for Altec?

2 A. Yes.

3 Q. And can you tell the Court what that statutory
4 maximum penalty amount is for Altec?

5 A. It is 11,000 per day per violation. For this
6 case, it was \$22,000.

7 Q. Now let's discuss the section 309 Clean Water
8 Act statutory factors individually.

9 Would you please list the eight statutory
10 factors for the Court?

11 A. Nature violation, circumstances, economic
12 benefit, gravity, ability to pay, prior history of
13 violations, degree of culpability.

14 THE REPORTER: I'm sorry.

15 THE WITNESS: Degree of culpability.

16 A. And other matters as justice may require.

17 Q. (BY MS. DIXON) Did you use all of the eight
18 statutory factors to assess a penalty for Altec?

19 A. No.

20 Q. What factors did you use?

21 A. I used three of them. I used the gravity
22 component, I did degree of culpability, and I used the
23 economic benefit.

24 Q. Can you explain to the Court how you calculated
25 the gravity factor for Altec?

1 A. Yes. I followed the guidelines in the Clean
2 Water Act Settlement Penalty Policy, or how they explain
3 the gravity component. Essentially, a monthly gravity
4 component that's considered for each month in which
5 there are one or more violations. And then the total
6 gravity component is you add up all the months.

7 For each month, the gravity component is
8 split up into four different factors: Factor A is
9 significance of violation; factor B is health and
10 environmental harm; factor C is number of effluent
11 limit violations; and factor D is a significance of
12 non-effluent violations.

13 Q. And then -- go ahead. Sorry.

14 A. Each component has a numeric value that you
15 assign to it, and then you add up all those numeric
16 values in a -- in a range -- has a range associated with
17 it. Then you add one to it, you multiply it by 1,000.

18 Q. Did you utilize all four of the components to
19 assess a penalty for the gravity factor in Altec's case?

20 A. No. I just looked at two components.

21 Q. And which components were those?

22 Q. B and D?

23 Q. Okay. Mr. Rudolph, starting with component B,
24 health and environmental harm, can you explain this
25 component to the Court?

1 A. Yes. It's a -- a value for this factor has a
2 range from 0 to 50. You select this factor based on --
3 on violations that present actual or potential harm to
4 the environment or to human health.

5 Q. And let's discuss this component in terms of
6 Altec. Can you tell the Court where exactly this
7 release occurred?

8 A. It was on a drilling site located up in Osage
9 County, Oklahoma. The drilling site was located on a
10 wildlife management area.

11 Q. And why is a wildlife management area in
12 significance in this case?

13 A. An area dedicated to protecting the
14 environment, dedicated to protecting animals.

15 Q. And what, if any, is the threat of a brine
16 release at a wild life management area?

17 A. Oh, it could impact it severely.

18 Q. How so?

19 A. Brine is very high in salt. It's very toxic to
20 any type of fresh water environment.

21 MS. DIXON: Your Honor, at this time, I am
22 showing Mr. Rudolph Government Exhibit No. 2.

23 (Exhibit 2 marked.)

24 Q. (BY MS. DIXON) Mr. Rudolph, could you take a
25 look at this document. Do you recognize this document?

1 A. Yes.

2 Q. And can you tell the Court what it is?

3 A. It is an inspection report produced by our
4 field inspector, Kent Sanborn, from an inspection dated
5 September 21st, 2007.

6 Q. And is this a fair and accurate
7 representation -- I'm sorry.

8 Did you use utilize this inspection report
9 in assessing a penalty against Altec?

10 A. Yes, I did.

11 Q. And is this a fair and accurate representation
12 of the October 2007 -- I'm sorry -- the September 2007
13 inspection report that you used to assess the penalty in
14 this case?

15 A. Yes.

16 MS. DIXON: Your Honor, at this time, I
17 offer Government's Exhibit 2 into evidence.

18 THE COURT: Any objection to that, Mr.
19 Adams?

20 MR. ADAMS: No.

21 THE COURT: Okay, without objection.

22 Q. (BY MS. DIXON) Was there evidence of a brine
23 release at the wildlife management area, Mr. Rudolph?

24 A. Yes.

25 Q. And where exactly did this release occur at the

1 wildlife management area?

2 A. It occurred and went to a creek.

3 Q. Was there evidence of a release of brine
4 anywhere else in the wildlife management area?

5 A. No.

6 Q. Was there brine -- evidence of brine anywhere
7 else at the wildlife management area?

8 A. Off-site?

9 Q. On-site.

10 A. Yeah. There was evidence all over the site.

11 Q. Okay. Was there any evidence of the
12 concentration of brine that had been released into the
13 -- the creek?

14 A. Yes.

15 Q. And can you tell the Court the concentration
16 found in the creek according to the September 2007
17 inspection report?

18 A. 30,000 parts per million total soluble salts.

19 THE REPORTER: I'm sorry. Can you repeat?

20 THE WITNESS: 30,000 parts per million
21 total soluble salts.

22 MS. DIXON: Your Honor, at this time, I am
23 showing the Respondent [sic] Government Exhibit 3.

24 (Exhibit 3 marked.)

25 Q. (BY MS. DIXON) Mr. Rudolph, can you take a

1 look at this exhibit? Do you recognize this document?

2 A. Yes.

3 Q. And what is it?

4 A. Ambient water quality criteria for chloride.

5 Q. How did you recognize this document?

6 A. I referenced it.

7 Q. In?

8 A. In doing research, as far as determining the
9 effects salt has on aquatic life.

10 Q. And did you utilize this report in your
11 analysis of a penalty for Altec?

12 A. Yes.

13 Q. And is this a fair and accurate representation
14 of the ambient water quality criteria for chloride 1988?

15 A. Yes.

16 MS. DIXON: Your Honor, at this time, may I
17 offer Government Exhibit 3 into evidence?

18 THE COURT: Mr. Adams, any objection?

19 MR. ADAMS: Ma'am, what's the title of that
20 document?

21 MS. DIXON: Ambient Water Quality Criteria
22 for Chloride - 1988. It is an EPA document.

23 MR. ADAMS: Okay. Yes, that's fine.

24 THE COURT: Yes. These documents are
25 already in the record in any event, but it's admitted

1 again.

2 Q. (BY MR. DIXON) Mr. Rudolph, based upon this
3 report, what is the significance of the concentration of
4 brine that was released into the creek by Respondent?

5 A. Well, it was much higher -- it was much higher
6 than what should be allowed.

7 Q. And what is the allowable amount?

8 A. According to this, there is a -- information in
9 it that would indicate levels as low as 230 parts per
10 million of total dissolved salts, would be -- would have
11 a toxic -- basically, a chronic, toxic effect on fresh
12 water fish.

13 Q. Are there animals in the Wildlife Management
14 area?

15 A. Yes.

16 Q. And what what kind of animals are out there?

17 A. There's deer, there's turkey, there's rabbits,
18 coyotes, foxes, squirrels, that type of thing.

19 Q. And how could a release of this magnitude
20 affect them?

21 A. Well, if they were to drink that water that was
22 contaminated, they could also become harmed or possibly
23 killed.

24 Q. What range, if any, did you assess against
25 Altec for this component?

1 A. Well, for the September 21st, 2007, violation,
2 I assessed the value of 4 out of the 0 to 50.

3 Q. And why did you choose a range of 4?

4 A. Well, I feel it's -- it's fairly low, but
5 something needed to be assessed here because of the
6 toxic effect salt has on a fresh water environment --

7 Q. And was there --

8 A. -- aquatic environment.

9 Q. I'm sorry. Was there can actual harm to the
10 environment based upon your observations?

11 A. There were some dead vegetation around the
12 facility.

13 Q. Mr. Rudolph, based upon your 8 1/2 years of
14 experience as an investigator and enforcement officer,
15 could you have assessed a higher range for this
16 component?

17 A. Yes.

18 Q. And let's discuss the March '08 inspection.
19 Did you also assess a -- a range for Altec for this
20 component?

21 A. Yes.

22 Q. And what was that range?

23 A. A 4 also.

24 Q. And could you explain to the Court why you
25 chose a 4 for that penalty?

1 A. Well, it's the same thing. Evidence showed
2 that salt water had been discharged from the facility
3 and into a creek, to a water body, that was clarified as
4 waters of the U.S., and I basically give it the same
5 value.

6 Q. Before we move on, Mr. Rudolph, I would like to
7 take a moment and discuss air drilling. Are you
8 familiar with air drilling?

9 A. Yes.

10 Q. How so?

11 A. Oh, from prior work experiences.

12 Q. Mr. Rudolph, does air drilling produce brine?

13 A. Yes.

14 Q. And could you explain to the Court how?

15 A. Well, any fluids that would hold, or any drill
16 cuttings for that matter that are high in salts that are
17 circulated up to the surface, could be considered oil
18 fill brine.

19 Q. Okay. Let's discuss component D, the number of
20 non-effluent limit violation. Can you explain this
21 component to the Court?

22 A. Yes. It has to do with the severity and the
23 number of non-effluent limit violations. It's basically
24 for unpermitted discharges, and consists of six
25 different non-effluent limit violations that you would

1 choose from.

2 The six are, if I can remember, monetary
3 reporting, pretreatment, sludge handling, unauthorized
4 discharges, other non-effluent limit violations, and
5 permanent milestone schedules.

6 Q. Did you consider all of those factors in
7 assessing a penalty against Altec for this component?

8 A. No.

9 Q. What did you consider?

10 A. I just considered one factor for the
11 unauthorized discharge.

12 Q. Okay. What range, if any, did you assess
13 against Altec for this component?

14 A. I gave it a 1.

15 MS. DIXON: Your Honor, at this time,
16 Complainant seeks the Court's permission to allow the
17 witness to leave the witness stand and approach the
18 easel for demonstrative purposes.

19 THE COURT: Certainly. While he's putting
20 stuff up there, though, could you describe it for the
21 benefit of Mr. Adams, Ms. Dixon?

22 MS. DIXON: Okay.

23 THE COURT: Maybe it would work better if
24 you came around to this side.

25 MS. DIXON: Okay.

1 Mr. Adams, this is the monthly gravity
2 component that Matt developed. If you look in your --
3 your -- if you have your notebook with you that I sent
4 you, it is Government Exhibit -- let me check -- it
5 would have been Government Exhibit 13. Okay?

6 MR. ADAMS: Okay.

7 MS. DIXON: And it is the components A, B,
8 C, D, as well as the total -- and then he gives a total
9 monthly gravity component, and then he shows a
10 calculation that he does for the 9-17-07 alleged
11 violation and the March 10th, '08 alleged violation.

12 MR. ADAMS: Okay.

13 THE WITNESS: Shall I explain?

14 MS. DIXON: Yes, please.

15 A. As I previously stated, the monthly gravity
16 component calculated for each month, which there is one
17 or more violations, basically consists of four different
18 factors, A, B, C and D.

19 And each factor has a numeric range you
20 want to chose from. So for factor A, significance of
21 violation, has a range from 0 to 20. Factor B, health
22 and environmental harm has a factor from 0 to 50.
23 Factor C, number of effluent violations, has a factor
24 from 0 to 5. And factor D, significance of non-effluent
25 violations has range from 0 to 70.

1 And then once you have -- once you
2 calculate each monthly gravity component for each
3 violation or violations, you add them together, you add
4 one to it, and you multiply by a thousand. And then
5 your total monthly gravity component is the summation of
6 all the monthly gravity components.

7 Q. Okay. Mr. Rudolph, for nine -- for the
8 inspection and the violation that we allege occurred in
9 September of '07, could you walk the Court through that,
10 using only the components that you considered?

11 A. A and C I didn't consider, because those have
12 to do with, I believe, permitted violations. So I gave
13 that a 0 for both those factors. B, dealing with health
14 and environmental harm, I felt brine is very toxic to
15 any aquatic fresh water environment, I chose a value of
16 4.

17 And then for D, for the unauthorized
18 discharges, I had a value of 1. Now what you do is you
19 add one to that, you multiply by a thousand, and that's
20 your amount as far as monetary amount. So that's
21 \$6,000.

22 MS. DIXON: Mr. Adams, could you hear that?

23 MR. ADAMS: Yes.

24 Q. Okay. And could you do the same thing for the
25 March '08 inspection?

1 A. I basically did the same thing. For A and C, I
2 gave it a 0.

3 (Fire alarm going off.)

4 THE COURT: Mr. Adams, we're going to have
5 to recess this for a minute. Can you -- will you be by
6 the phone in about 15 to 20 minutes?

7 MR. ADAMS: Yes, sir.

8 THE COURT: We're apparently having a fire
9 drill.

10 MR. ADAMS: Well --

11 THE COURT: We'll get back to you.

12 MR. ADAMS: Enjoy that. I'll be there.

13 THE COURT: Okay. We'll call you right
14 back. We're going into recess for a minute.

15 (Break taken from 9:36 a.m. to 9:50 a.m.)

16 THE COURT: Mr. Adams, our fire drill is
17 over and everybody is reassembled here. I'll let Mr.
18 Rudolph take the witness chair again and we will
19 proceed.

20 Recess has ended.

21 A. As I was explaining with the March 10th, 2008
22 violation, the monthly gravity component calculation for
23 A and C -- factors A and C, I gave that a value of 0. I
24 felt that had to do with permitted violations, and
25 clearly here in this case, there was an unpermitted,

1 unauthorized discharge. I did apply values B and D also
2 for this monthly gravity component.

3 For B, I also gave it a 4, based on the
4 salinity levels that were observed in the creek at the
5 time of inspection. And for factor D, I also gave that
6 a 1 for the unauthorized discharge. And you want to
7 add -- add these together also, add one to it, multiply
8 by a thousand, \$1,000. For this one, you get \$6,000
9 also.

10 Q. (BY MS. DIXON) Mr. Rudolph, you may take your
11 seat.

12 A. And then you want to add both the monthly
13 gravity components to get the total monthly gravity
14 component, which is 12,000.

15 Q. Thank you. At this time, let's discuss the
16 degree of culpability factor, Mr. Rudolph. Can you
17 explain this factor to the Court?

18 A. It has to do with holding the Respondent or the
19 alleged violator responsible for the violation.

20 Q. And did the Respondent make any efforts to
21 clean up the pit?

22 A. He made some efforts to clean up the site.

23 Q. And what did he do?

24 A. He bag filled in the pits, and I believe it was
25 noted that he had brought out gypsum and spread it over

1 the surface.

2 Q. And was this satisfactory to EPA?

3 A. No.

4 Q. Can you explain to the Court why not?

5 A. It appears the site continued to discharge
6 brine.

7 Q. And what, if anything, did the Respondent do to
8 make any efforts to remediate the creek? Do you have
9 any knowledge of that?

10 A. No. I don't have any knowledge.

11 Q. Mr. Rudolph, in assessing your penalty, did you
12 take into consideration Altec's attempts to remediate
13 the pit?

14 A. Yes.

15 Q. Mr. Rudolph, according to the March 2008
16 inspection report, what was the concentration of brine
17 released in the creek?

18 A. Could you repeat that, please?

19 Q. According to the March 2008 inspection report,
20 what was the concentration of brine released in the
21 creek?

22 A. I believe as high as 6,700.

23 Q. And what, if anything, did that indicate to
24 you?

25 A. Well, that discharge continued from the site.

1 Q. Mr. Rudolph, did EPA take any samples
2 upgradient of the creek?

3 A. No.

4 Q. Can you explain to the Court why?

5 A. Couldn't find any water. It appeared that
6 where we did measure salinity, basically, the point of
7 the entry of the creek was at the head waters of that
8 creek.

9 Q. And did EPA conduct samples downgradient of the
10 creek?

11 A. Yes.

12 Q. And what did EPA find?

13 A. Well, on the September 17th, 2007 inspection, I
14 believe it was 2,500 parts per million.

15 Q. Mr. Rudolph, what was the Respondent's attitude
16 in cleaning up the pit?

17 A. He felt -- I don't know. Repeat that.

18 Q. Based upon your observation -- let me ask this.
19 Did you have any conversations with -- with the
20 Respondent regarding cleaning up the pit?

21 A. Yes.

22 Q. And what -- what did he say?

23 A. I can't recall.

24 Q. Okay.

25 MS DIXON: Your Honor, at this time, the

1 Complainant seeks the Court's permission to allow the
2 witness to leave the witness stand and approach the
3 easel for demonstrative evidence purposes only.

4 THE COURT: Once again, let's describe it
5 verbally as we go along so Mr. Adams can follow it.

6 MS. DIXON: Okay. Go ahead, Matt, and make
7 sure you speak loudly so --

8 A. Am I supposed to be doing the degree of
9 culpability calculations?

10 Q. (BY MS. DIXON) Yes. Yes.

11 A. Well, basically, I just took the total monthly
12 gravity component, and multiplied it by 20 percent.

13 Q. How did you reach the 20 percent?

14 A. I assessed 10 percent each monthly gravity
15 component.

16 Q. And why did you choose 10 percent?

17 A. I just felt it was a good number.

18 Q. What -- what was the range that you could have
19 considered?

20 A. I don't think -- I don't believe there is a
21 range for this.

22 Q. Okay.

23 A. Anyways, I did it, and I got \$2,400 for
24 culpability -- degree of culpability.

25 Q. And how did you get 2,400 again?

1 A. Multiply the 12,000 by 20 percent.

2 Q. And what was the total amount of the assessed
3 penalty for the degree of culpability factor?

4 A. \$2,400.

5 Q. And can you -- did EPA -- did EPA fine or note
6 any other off-site sources that could have contaminated
7 the -- the creek with the brine?

8 A. No.

9 Q. Mr. Rudolph, were there any other factors that
10 you considered in computing a penalty for Altec?

11 A. I did look -- I did look at the economic
12 benefit factor.

13 Q. Mr. Rudolph, I'm sorry. Let me let you take
14 your seat again. Can you tell the Court what the one
15 remaining factor is again?

16 A. Economic benefit.

17 Q. And are you assessing a penalty for this factor
18 today at hearing?

19 A. No, I'm not.

20 Q. One final question, Mr. Rudolph. What is the
21 total proposed penalty amount that EPA is seeking today?

22 A. \$14,400.

23 MS. DIXON: Pass the witness, Your Honor.

24 THE COURT: Mr. Adams, you may now question
25 Mr. Rudolph if you -- if you wish.

1 MR. ADAMS: Okay.

2 EXAMINATION

3 BY MR. ADAMS:

4 Q. Well, Mr. Rudolph, I have a couple of questions
5 regarding number one, the EPA's determination to not do
6 any type of upgradient sampling to the creek,
7 considering you based this on the fact that was the head
8 water start of the creek.

9 Have you actually seen the site?

10 A. No. I have not. Well, I haven't walked out
11 there in person. I have seen it through photos.

12 Q. Okay. The photos that are presented to me or
13 better photos?

14 A. I had photos that Kent Sanborn had done. And I
15 also had photos from the state biologist with the
16 Oklahoma Department of Wildlife Conservation. He also
17 had photos of the site.

18 Q. Okay. Did you see the photos that I forwarded
19 to you and to Ms. Dixon, four or five of them, being
20 actual aerial photos of the entire site?

21 A. I don't know.

22 Q. So they weren't -- none of those you don't
23 recall seeing those where all of the trees are green,
24 the inadequate job that we did restoring the site, that
25 there's grass growing, that everything looks actually

1 better than when we started?

2 A. Oh, yes. I haven't seen --

3 Q. Did you see that photo?

4 A. No, I have not. No, sir.

5 Q. Well, it would have been good for -- because
6 they were forwarded to you, and they were forwarded to
7 Ms. Dixon at the same time.

8 Are you -- are you familiar with how much
9 rain occurred --

10 A. No.

11 Q. -- in Oklahoma in October, September, October.
12 Well, even beginning in August of 2007.

13 A. No, I'm not.

14 Q. Do you realize that the day in question that
15 the state biologist brought up that we had a leaking
16 containment pit, that there were over 7 1/2 inches of
17 rain in four hours that flooded the entire area?

18 Did anybody show you the photos of the rain
19 events with you, where water a quarter of a mile wide
20 was passing across our site from upgradient locations?

21 A. No. I don't believe I've seen those photos.

22 Q. Okay. Well, would those -- would those have
23 had a bearing on your decision?

24 A. No.

25 Q. Okay. And what about the -- in here where you

1 list the -- in the complaint that we spent \$985 for
2 remediating the problem?

3 A. Can you repeat -- repeat that, please?

4 Q. And let me get to the -- to the page where you
5 factored -- I apologize guys, it's hard working out of a
6 pickup here -- that you made reference to the fact that
7 we had spent 685, 980 -- not even \$685 in an effort to
8 correct the problem.

9 A. Did I take that into consideration? No, not
10 really. I -- I didn't feel like that that had any
11 relevance.

12 Q. And I was just curious why you reference \$685
13 when we submitted over \$23,000 in invoices. And do you
14 recall when I submitted those invoices what your
15 statement was to me?

16 A. Yes. I do recall when you had submitted some
17 invoices. I believe there was --

18 Q. Do you recall what your statement was to me?

19 A. No. I do not. On which date?

20 Q. The fact that -- that you basically called me a
21 liar saying I fabricated the invoices?

22 A. No. I do not.

23 Q. Do you recall that?

24 A. I do not recall that.

25 Q. Okay. Well, there was over \$23,000 spent

1 pumping out the creek, and you did have copies of those
2 invoices. I'm not sure why you chose to list \$685
3 instead of 23,000.

4 A. I -- I can't -- I don't know.

5 Q. Especially when you have the invoices in your
6 hand. And the fact that we're referencing dead
7 vegetation in October, when their deciduous trees that
8 begin losing their leaves in September, October.

9 And so I sent you aerial photos showing you
10 that all of the trees were perfect. I explained to you
11 that great care was taken meeting with the Department of
12 Wildlife, picking this site in particular, handling the
13 trees exactly how they requested them to be handled.
14 The exact orientation of the site, the size of the site.
15 When we did the remediation effort with the gypsum, do
16 you remember what you said?

17 A. No. I do not.

18 Q. You said, hey, you know, when we were talking
19 incorporate gypsum into the site, I wasn't talking about
20 bringing a damn 50-pound bag of gypsum and throwing it
21 around and calling it good. And I said to you, I said,
22 do you see the receipts, Mr. Rudolph? We actually
23 brought in a few semiloads, and we actually incorporated
24 it into the site down six inches below with the rippers
25 on a bulldozer.

1 A. Thank God. Thank you. I think if I may -- I
2 don't mean to interrupt, but this penalty doesn't even
3 take that into consideration. It just considers the two
4 unauthorized discharges. It really doesn't --

5 Q. Well, I know. But now when we're talking
6 about --

7 A. -- take --

8 THE REPORTER: I can only get one at a
9 time.

10 Q. (BY MR. ADAMS) -- the unauthorized discharge,
11 we're assuming that everything came from my site, but
12 you did nothing ungradient when we had a wall of water
13 passing over our site, coming from upgradient sources,
14 and you chose -- the inspector chose mypucalepsis
15 [*phonetic*] an example of upgradient --

16 A. Yeah.

17 Q. -- which would greatly effect our site, would
18 it not?

19 A. According to our inspector, he did not note any
20 upgradient sources.

21 Q. Then as far as when he collects samples, does
22 he typically do a map showing the locations where he
23 took those samples, and does he typically fill out a
24 chain of custody? Or do the sample results typically --
25 how do even know these sample results came from my site?

1 A. What's that?

2 Q. I said, how do I even know the results that are
3 listed under Exhibit 4 even came from my site, and where
4 they came from on the site?

5 A. I'll briefly explain how Kent takes samples.

6 Q. And maybe I'm missing something in my packet,
7 but what I'm seeing is a fax cover sheet to you from
8 Kent Sanborn dated 11-15-07 that says, Altec Government
9 Exhibit 4. Right behind is a water quality report from
10 the Oklahoma State University analytical laboratory that
11 lists a sample number from them, and a location that's
12 OK-1.

13 A. Yes. I believe the samples you're referring to
14 -- the sample results you're referring to were sent in
15 from the state biologist John Rempe.

16 A. Okay.

17 Q. Kent Sanborn -- when we collect sample
18 information or salinity information, we use a YSI 30
19 conductivity meter. That's --

20 Q. Okay. So the samples that you're saying were
21 collected by the EPA, they weren't. They were actually
22 collected by the state biologist?

23 A. No.

24 Q. So there's no chain of custody, there's no
25 sample map, there's no anything associated with these

1 samples. So --

2 A. Well, anyway, what Kent had observed was in the
3 two inspection reports, and basically that is what I
4 referenced in the complaint --

5 Q. Okay.

6 A. -- is basically based on Mr. Sanborn's
7 inspections, observations, inspection findings, and that
8 is basically what those salinity levels and those
9 observations is basically what I based this whole -- the
10 gravity component on.

11 Q. Okay. Well, and when I called to discuss with
12 you his report and how it wasn't exactly factual of the
13 events and the time, the naming of the creek, the things
14 like that, what -- what was your response to that?

15 A. I don't recall.

16 Q. You basically just told me that's the statement
17 and we'll deal with that later. So, if you so choose to
18 fight it, you have that right, we'll deal with it then.

19 So, I said, well, Mr. Rudolph, you know,
20 there's -- there's a lot of extenuating circumstances
21 here that are making it look like we weren't being
22 cooperative. I said, there was a Osage [unintelligible]
23 biologist that were on-site that met with Mr. Rempe. I
24 actually had one of my environmental engineers that has
25 his Ph.D. in environmental engineering from Oklahoma

1 University meet with Mr. Rempe at the site.

2 We went over, we discussed everything, we
3 immediately brought in tank trucks, we extracted any
4 water that was in the creek. When Mr. Sanborn came out,
5 he requested that we did a detention pond in the middle
6 of the creek. Do you recall that in his testimony?

7 A. Yes. I believe in the order, we had ordered
8 that to build a detention.

9 Q. Correct. And do you realize why I couldn't
10 follow that order even though I told you verbally, and
11 Kent Sanborn got it direct from the Bureau of Indian
12 Affairs, that I did not have archaeological clearance to
13 dig in the creek bed. The only thing I was authorized
14 to do is to extract water with a pump truck from our
15 site.

16 So we actually had to have hose run down to
17 the -- to the pooling area of the creek. We paid to
18 have it on standby there. Every time it would rain for
19 the next 30 days, we mobilized the pump truck and ran
20 hoses down and waited for the rain.

21 THE COURT: Mr. Adams, a lot of what you're
22 doing right now is direct testimony, rather than
23 questioning Mr. Rudolph.

24 MR. ADAMS: Oh. I'm sorry. I --

25 THE COURT: I --

1 MR. ADAMS: -- was just questioning why --

2 THE COURT: -- I understand that.

3 MR. ADAMS: -- if he recalled this, and why
4 none of this is referenced in the report.

5 THE COURT: I think it is certainly fair
6 for you to ask him whether he considered certain issues,
7 but in terms of going into direct testimony here on --
8 on what you did and what the Bureau of Indian Affairs
9 told you --

10 MR. ADAMS: Okay.

11 THE COURT: -- and allowed you to do, you
12 should probably keep that for your direct testimony.

13 MR. ADAMS: Oh, okay. I apologize.

14 THE COURT: Well, there's no reason to
15 apologize, just a ruling from the bench.

16 MR. ADAMS: Yes. Well, I -- I apologize,
17 but I'm not sure how to proceed then, I guess.

18 THE COURT: Well, all right. Well, do you
19 want to pass the witness then, and -- and get your turn?

20 MR. ADAMS: I -- that's -- that's fine.

21 THE COURT: Well, I have a few questions
22 myself.

23 On these penalty calculations, you have
24 the total monthly -- if I understand your monthly
25 gravity component in your calculations, Mr. Rudolph, you

1 essentially just took each of the violations, assumed
2 they were both of equal gravity, and multiplied the
3 amount of the -- I'm sorry -- not the gravity component,
4 but the culpability component, applied your multiplier
5 to the gravity component on both violations, essentially
6 the same multiplier of 20 percent; is that correct?

7 THE WITNESS: Well, 10 percent for each
8 one.

9 THE COURT: Ten percent. Ten percent for
10 each. Do you see any distinction between the
11 culpability of these violations, given the fact that
12 we've already established on liability in this case, and
13 it is the law of this case right now, that the first
14 discharge occurred as a result of Mr. Adams cleanup
15 attempts as ordered by the State of Oklahoma?

16 THE WITNESS: It appeared -- really it
17 appeared that there was a pit.

18 THE COURT: And we -- we know that there
19 was a pit.

20 THE WITNESS: Yes. Yes.

21 THE COURT: But the law of this case, Mr.
22 Rudolph, the first discharge occurred when Mr. Adams was
23 washing down that pit or the backfill over that pit. We
24 still contained fine drill cutting, big drill cuttings,
25 according to the pictures provided by the State of

1 Oklahoma, had been removed from the pit.

2 Mr. Adams primary culpability here, the way
3 the regional judicial officer sees it at this point, was
4 in using contaminated water from another creek to wash
5 out that pit, and that is how the first discharge
6 occurred; is that correct?

7 To what degree should Mr. Adams be held
8 culpable here for choosing the wrong creek to get his
9 water from?

10 THE WITNESS: I think he should be held
11 responsible.

12 THE COURT: Yes. He is being held
13 responsible, but how much culpability is there -- there?
14 What should he have done?

15 THE WITNESS: Twenty percent is fine for
16 that 6,000 when they pay for that first violation.

17 THE COURT: Okay. So the second --

18 THE WITNESS: So \$1,200. \$1,200.

19 THE COURT: Okay. For the second
20 violation, although you had -- or Mr. Sanborn had
21 already advised Mr. Adams to build a retention basin
22 between the former site of the reserve beds in the
23 creek; he didn't do that, and you subsequently ordered
24 Mr. Adams to build that retention basin.

25 THE WITNESS: Yes, sir.

1 THE COURT: Did you talk to the State of
2 Oklahoma to determine at the time whether Mr. Adams was
3 even allowed on the property. The evidence that's been
4 submitted here, essentially at the front end of this,
5 the State of Oklahoma appears to me to have ordered
6 Mr. Adams to clean it up and get out.

7 THE WITNESS: No. I did not talk to the
8 State of Oklahoma.

9 THE COURT: Okay. And for the record,
10 would you explain the difference in the gravity
11 component between A, significance of violation, and D,
12 significance of non-effluent limit violations. Why is
13 that not the same thing?

14 A. Well, significance of violations have to do
15 with the degree of exceedance of the most significant
16 effluent limit violation. He is effluent limit
17 violation, meaning it will pertain to a permitted
18 discharge, at least that's how I interpreted.

19 The specification of noneffluent limitation
20 violation, it actually has six subcomponents or six
21 non-effluent limit violations there, and one of them is
22 unauthorized discharge. And I applied a 1 for each
23 gravity component.

24 THE COURT: Okay. So if I understand
25 correctly, you -- the gravity component that, in your

1 calculations, is attributable. One, to the fact that he
2 had no permit. And two, to the deleterious effect of
3 the discharge.

4 THE WITNESS: Yes, sir.

5 THE COURT: All right. Okay. And I take
6 it -- and I just want to clarify this -- that in your
7 regional calculations, not the ones you presented today
8 but the ones underlying the second -- the first amended
9 complaint, you were looking at a failure to report --
10 were you enhancing that penalty for failure to report.

11 THE WITNESS: No.

12 THE COURT: No. Okay. I have no further
13 questions here. So unless -- all right. You can sit
14 down, Mr. Rudolph. Thank you very much.

15 THE WITNESS: Okay.

16 THE COURT: Well, now it's your turn,
17 Mr. Adams.

18 You don't have to ask yourself questions.
19 You can state your side of the factors that you want to
20 be considered in terms of the calculation of penalty
21 right now. Go.

22 MR. ADAMS: Okay. Well, you know, I -- I
23 believe that -- that -- an -- an incident occurred on a
24 site that I was responsible for, that my company -- I'm
25 not sure of the level I should be held responsible

1 versus some of the extenuating circumstances, such as
2 upgradients, such as following the direction by washing
3 the creek and using a water source that had air brine
4 levels than we had. All I know is that everything did
5 was done --

6 THE COURT: Pardon me, Mr. Adams --

7 MR. ADAMS: -- without question.

8 THE COURT: Mr. Adams, let me interrupt you
9 here for a minute. We forgot to swear you. If the
10 court reporter will swear you over the phone, raise your
11 right hand, please.

12 MR. ADAMS: Okay.

13 THE REPORTER: I can't swear him in. You
14 can. I can't.

15 THE COURT: Well, I'll do it then.

16 Mr. Adams, do you swear or affirm to tell the truth, the
17 whole truth, and nothing but the truth in your testimony
18 here?

19 MR. ADAMS: Yes, I do.

20 THE COURT: Thank you. Go ahead and
21 proceed.

22 MR. ADAMS: Well, I apologize. I kind of
23 lost my train of thought.

24 THE COURT: I'm sorry.

25 MR. ADAMS: But -- but, basically, we -- we

1 understood the potential severity of the issue and we
2 responded to it. And we spent a tremendous amount of
3 time, a tremendous amount of money exceeding, well
4 exceeded what the state required, what the Bureau of
5 Indian Affairs required in order to just make sure
6 everything was addressed properly, and that everything
7 was done in a prudent manner to everyone's satisfaction.

8 And yes, kind of all of the work we did was
9 a little bit for naught when the last loads of water
10 that we grabbed, which we have the ability to grab water
11 from a flowing creek, we couldn't make it back to -- to
12 town in time.

13 The site is relatively remote in order to
14 refill the water trucks, and so we're -- we're -- the
15 government regulations were acceptable to grab water
16 from a flowing water source, which we did, is at the
17 bottom of our site. Is that water had much higher brine
18 levels than what we originally started with from our
19 incident.

20 Due to the amount of the rain that
21 occurred, and the fact that, you know, we actually sent
22 pictures of water two, three, four inches deep passing
23 across our site, coming from upgradient sites where they
24 actually had open pits with water in them.

25 We -- we took pictures of that flowing down

1 the road across our site, but it seems -- it -- it just
2 seems a little bit unbelievable to me that nobody wants
3 to look at a potential upgradient source as to being a
4 factor when we had actually very little water in our
5 pit. And the fact that our water released when our pit
6 was filled with rain water in a couple hours because we
7 had 7 1/2 inches of rain in four hours.

8 And so I think in terms of, you know,
9 mitigating penalties, you know, from what we understand
10 the operator that actually was found to be in violation
11 for -- for polluting the actual flowing creek, he -- he
12 received no penalty.

13 And then where they're referencing things
14 that we were supposed to do to have continued work on
15 this site, we -- we haven't had access to the site since
16 -- I'm not sure what the date from the state attorney
17 general -- but we've been in a battle with the State of
18 Oklahoma and the Department of Wildlife that we actually
19 just finished up last month to give us access to the
20 site.

21 So from the time we were denied access to a
22 month ago, we actually have not had any access to that
23 site whatsoever to do anything, and I -- I wasn't
24 knowledgeable of any request for us to do anything.

25 THE COURT: Well --

1 MR. ADAMS: And then as far as, you know,
2 some of the requests that were made, we followed every
3 single request to the letter, except for the -- the
4 digging of the tension pond in the middle of the creek
5 because, unfortunately, it was just too far away from
6 where we had archaeological clearance, and the Bureau of
7 Indian Affairs would not grant us clearance to go do
8 that. And the EPA inspector was well aware of it,
9 because he was standing there when the Bureau of Indian
10 Affairs representative said, no, you cannot do that.

11 And it will take us approximately two
12 months to get clearance to do that. And I told them,
13 well, what I'll do is I'll use the natural pool at the
14 top here. And I said, any time it's going to rain over
15 the next, you know, couple of weeks, I said, we will
16 insure that we have a hose there, we will pump that
17 water, and we will dispose of it. And I did that. And
18 -- and I submitted invoices totalling 20-some thousand
19 dollars in affirmation that we did those.

20 There was the state inspector with the
21 Department of Wildlife was there through all of the
22 work. So -- it -- it was no mystery that we were
23 performing those operations. And I just don't believe
24 any of those events were taken into effect -- taken into
25 account when they calculated this penalty, and why in

1 the world somebody that actually was ongoing polluting a
2 creek got no penalty.

3 That actually created more problems for me,
4 created more cleanup issues, more cost, but yet, they
5 weren't -- they -- they weren't penalized for their
6 actions and to my knowledge have done no remediation
7 action of the water in the creek.

8 And I would have liked for the EPA to have
9 included the -- the documents, the photos, everything
10 that I sent, I would have liked for them to have
11 included that in their determination. And I would have
12 liked for them to include it into the passage so that
13 Your Honor could have actually seen it .

14 And, other than that, that's about all I
15 have.

16 THE COURT: I have a few questions. Well,
17 I'm sorry, Ms. Dixon, it's your turn. No questions?

18 MS. DIXON: No questions.

19 THE COURT: Mr. Adams, I have a few
20 questions here.

21 MR. ADAMS: I'm sorry. I couldn't hear
22 you.

23 THE COURT: I have a few questions here.

24 MR. ADAMS: Yes, sir.

25 THE COURT: How did you end up -- and I

1 understand that mineral rights are difficult in Osage
2 County since the subsurface or mineral rights are held
3 in trust for the Osage Tribe, and the surface owners are
4 subject to state law.

5 How in the world did you end up drilling in
6 this location without -- how did you originally get into
7 this fix?

8 MR. ADAMS: Well, basically, it was -- I --
9 I didn't realize there was an ongoing battle with the
10 State of Oklahoma and the Federal Government for lands
11 that they own in the Osage where they're the surface
12 owner. Nobody actually disclosed that to me.

13 Basically, we do geological review, and we
14 pick locations based on -- it's -- it's about 130 points
15 we go over to pick where we would want to drill. And,
16 unfortunately, it actually ended up in a location in the
17 Department of Wildlife. We got the lease, nobody
18 explained to us that there were issues. We actually
19 contacted John Rempe, which was the representative that
20 they told us to contact. I think he was a little bit
21 unknowledgeable at this friction between the State and
22 the BIA.

23 And so we proceeded to submit our permit,
24 submit everything, get approval. We sent checks for the
25 location fee. We did everything, and I think,

1 unfortunately, it somehow slipped under the radar and
2 then next thing you know, we're drilling, and -- and
3 that's when kind of all heck broke loose.

4 And that's when there was -- Mr. Rempe was
5 taking a lot of pressure from the Department of Wildlife
6 for even allowing us to be out there. The state
7 attorney general got involved. And needless to say,
8 it's been a four-year battle --

9 THE COURT: Okay. That's --

10 MR ADAMS -- with the State of Oklahoma.

11 THE COURT: That's -- that's -- I think
12 you've answered my question. Let me ask --

13 MR. ADAMS: -- partially by the Federal
14 Government, but mostly by us too.

15 THE COURT: Okay. Mr. Adams --

16 MR. ADAMS: And --

17 THE COURT: -- Mr. Adams, you've answered
18 my question already. And I have another one for you.

19 MR. ADAMS: Okay. Sorry about that.

20 THE COURT: No. That's okay. I have
21 another one for you. You indicated that -- that you now
22 have access to this site. You've reached some agreement
23 with the State?

24 MR. ADAMS: Yes, sir.

25 THE COURT: Is the well currently

1 producing?

2 MR. ADAMS: No, not yet. We just now got
3 through all of the extensions with the Bureau of Indian
4 Affairs, and our attorney is in contact with the
5 Department of Wildlife to finalize everything now. So we
6 don't actually have access to the site yet, but we
7 expect to relatively quick. And, yes, we have an
8 agreement in place. And everything seems to be
9 corrected.

10 THE COURT: Okay. The -- I -- I can't help
11 but wonder, in the conference call you and Ms. Dixon and
12 I had yesterday for our sort of a impromptu status
13 conference we had. You said something about your
14 ability to pay a penalty. Do you want to say anything
15 about that today?

16 MR. ADAMS: Well, this -- this whole
17 situation has actually just devastated me financially.
18 You know, not only did I spend every bit that I had in
19 savings, but I spent -- cashed out my IRAs to make it
20 through this. And, basically, you know -- basically
21 we're -- we're just -- we've -- we've made it to the end
22 here, and we're hoping that we'll be able to borrow
23 enough money on -- in order to -- to continue to
24 complete the drill.

25 THE COURT: Okay. Do you have other

1 producing wells?

2 MR. ADAMS: No, sir.

3 THE COURT: Okay.

4 MR. ADAMS: We have a leasehold that we own
5 a percent of that is producing, but we don't generate
6 any revenue from it yet.

7 THE COURT: Okay.

8 MR. ADAMS: We probably won't be generating
9 revenue from it until January of 2012.

10 THE COURT: Okay. Since I've asked a few
11 questions here, I'm going to give Ms. Dixon another
12 chance to cross-examine.

13 EXAMINATION

14 BY MS. DIXON:

15 Q. I just have a question, Mr. Adams, based upon
16 the questions that Your Honor asked. And my first
17 question is, your -- your title at Altec Petroleum
18 Group, could you -- what is your title there?

19 A. President.

20 Q. And at Altec Engineering, is that also your
21 company?

22 A. Yes.

23 Q. Are you also the president there?

24 A. Yes.

25 Q. And isn't it true that Altec Engineering does

1 environment consulting?

2 A. Yes.

3 Q. And what does that -- what does that entail?

4 A. We do underground storage tanks oversight. We
5 do soil samples. We do site remediation work.

6 Q. Do you consult with other environmental
7 companies about environment regulations and how to
8 comply with those regulations? Do you provide that type
9 of information to them?

10 A. We do in certain aspects, depending on the type
11 of environmental concern and the type of company
12 involved.

13 Q. Okay. And you also mentioned that you now have
14 access with the State to go on to the property. At any
15 time, did you ask EPA to help you gain access to gain --
16 to go on the property?

17 A. No. We were unaware that we needed to be doing
18 anything on the property.

19 Q. Well, in your testimony you stated that you
20 were told to get off the property; is that correct? To
21 clean it up and get off the property?

22 THE COURT: I think that was my statement.

23 A. Correct. But that was from -- that was from in
24 2007. I was referencing a -- kind of a rebuttal to when
25 they reinspected the site in 2008, they made reference

1 that we were supposed to be doing some sort of follow-up
2 that I wasn't aware of.

3 Q. (BY MS. DIXON) Would you --

4 A. And the fact that we couldn't have access to
5 the site because we had an order from the state attorney
6 general that we needed to take care of whatever was
7 done, vacate the site, and that's what we did.

8 Q. So is it your testimony that after September
9 '07, Mr. Rudolph never contacted you again, and told you
10 that you needed to do further cleanup at the site?

11 A. Not that I recall.

12 MS. DIXON: Your Honor, may I have a
13 moment?

14 THE COURT: Yes.

15 A. And we did clean up actions into October, but
16 I'm saying, once that -- that final cleanup was done in
17 October of '07, I don't recall ever speaking to Mr.
18 Rudolph about any follow-up.

19 THE COURT: You're talking about pumping
20 out the -- the last time you pumped out the hole in the
21 creek?

22 MR. ADAMS: That's it.

23 THE COURT: Okay.

24 MR. ADAMS: The last time that we did that,
25 after the last rainstorm, we were done, we honored the

1 cease and desist operations from the State and we
2 demobilized and we have not been on that site.

3 THE COURT: Mr. Rudolph -- Mr. Adams, the
4 invoices in the file, and I don't know if they represent
5 all of the invoices, indicate that you pumped out the
6 creek twice. Once, essentially immediately after the
7 original wash out on -- on your reserve pit, and the day
8 you back filled it and sprayed it down with salty water
9 and one other time.

10 Did you pump out the hole in the creek?
11 How many occasions did you pump out the hole in the
12 creek?

13 MR. ADAMS: I don't recall exactly, but I
14 know we had at least four or five rain events that we
15 mobilized for. Some of them, there was no water
16 generated, so we probably didn't have a water disposal
17 fee, we probably just had pumping, you know, time for
18 the truck. And I apologize. I don't have my notes with
19 me to be able to tell you exactly.

20 THE COURT: Ms. Dixon, back to you.

21 MR. ADAMS: But we did pump out the creek
22 numerous times.

23 Q. (BY MS. DIXON) Mr. Adams, I want to go back to
24 your testimony a few moments ago when you stated that
25 after October '07, you weren't aware that you needed to

1 do anything further at the facility. Is that your
2 testimony today?

3 A. That I recall, yes.

4 Q. Do you remember actually in your testimony
5 earlier, as well as a Government Exhibit 11 in the
6 document that you have, a record of communication
7 between you and Mr. Rudolph?

8 A. When was that?

9 Q. March 12th of '08.

10 A. Yes. I have document 8 in the package.

11 Q. And in that record of communication, Mr. Adams,
12 it doesn't state that you informed Mr. Rudolph that you
13 were denied access, that you couldn't get back on that
14 property, does it?

15 A. I -- I don't know. Would you like for me to
16 read this document and tell you that?

17 Q. Yes, sir.

18 A. Oh. I don't see where it was told to Mr.
19 Rudolph, but at that time, I wasn't actually dealing
20 with Mr. Rudolph. I don't believe I was dealing with
21 Kent Sanborn and the Bureau of Indian Affairs biologist.

22 Q. Right. Mr. -- Mr. --

23 A. And so I believe the two of them -- that I was
24 meeting with two of them, and I actually met them, I met
25 Kent Sanborn at the gate and told him that -- and then

1 when I'm talking about the gate, this lease is actually
2 up three or four miles off of Highway 10, and I met him
3 at the gate, and we explained to him that we demobilized
4 from the property, and that we have been issued a cease
5 and desist from the State. I don't recall that ever
6 coming up in a conversation with Mr. Rudolph. But --

7 Q. Mr. Adams, in the -- in Government Exhibit 11,
8 Mr. Rudolph tells you that you need to do more to clean
9 up the site, doesn't he?

10 A. I -- I don't recall ever having a phone
11 conversation with Mr. Rudolph in March of '08 where he
12 told me that we needed to do any further cleanup.

13 Q. Mr. Adams, wasn't it your testimony earlier
14 that you had several conversations with Mr. Rudolph in
15 which --

16 A. Yes.

17 Q. -- in which you stated that -- in fact, some of
18 the language is right here. Would you care to read --
19 read that one more time?

20 A. Okay. I -- I don't recall the conversation
21 where he informed me that there was noncompliances with
22 the CWA. I do recall discussing the fines, and I do
23 recall saying that I would like to have a hearing
24 because we -- we just couldn't -- couldn't communicate
25 together.

1 Q. Okay. I'm just going to ask you a couple more
2 questions. We're going to move on. In regarding your
3 ability to pay, did you ever submit any documents to EPA
4 regarding your ability to pay this penalty?

5 A. No. I didn't realize I was needed to.

6 Q. And one more question, Mr. Adams. You have
7 discussed rain events, several rain events, actually.

8 Did you provide EPA with any official
9 documentation regarding the amount of rain that occurred
10 -- occurred in Oklahoma during these inspections?

11 A. Not in writing, but verbally with Mark Hendrix,
12 the Bureau of Indian Affairs representative and Kent
13 Sanborn.

14 Q. And, Mr. Adams, you did see the inspection
15 reports on 9-17-07 and 3-10-08, correct? Did -- did you
16 see --

17 A. I don't recall getting the one from 3-10-08,
18 but I -- I might have. I did get the inspection report
19 because I -- from '07, because I discussed -- I recall
20 discussing it at length with Mr. Rudolph, and some of
21 the inconsistencies contained in the report and some of
22 the questions that I had regarding -- or starting the
23 cleanup at the site.

24 Q. Mr. Adams, do you have access to the -- the
25 photographs that included the inspection report on

1 September 17th of '07?

2 A. Yes.

3 Q. And if there was such a rain event as you
4 testified today, wouldn't that -- that ground look very
5 muddy? It wouldn't look dry, would it?

6 A. Well, I don't know. I mean, I don't know the
7 date of the photographs --

8 MS. DIXON: No more questions, Your Honor.

9 A. -- so I apologize. Is there a date on these,
10 Ms. Dixon?

11 THE COURT: That's okay. The question has
12 been answered and asked.

13 MR. ADAMS: Oh, okay.

14 THE COURT: Ms. Dixon, do you have any
15 redirect?

16 MS. DIXON: No, sir.

17 THE COURT: Okay. In that case, the -- the
18 testimony here is closed. I think I will make a couple
19 of remarks, however, some gratuitous advice to you,
20 Mr. Adams.

21 You've mentioned a number of documents that
22 you say -- and aerial photographs -- that you say you
23 have sent to EPA and so forth. Certainly Ms. Dixon and
24 Mr. Rudolph have no real obligation in this matter to
25 submit such evidence, even if they received it. I

1 personally believe they probably didn't. The
2 inspection, or the record of communication that you just
3 discussed, they included in the record, even though it
4 is exculpatory. Had they not included that information
5 on your side of the story in this record, it's very
6 likely that I would have granted the original motion for
7 an accelerated judgment in the amount of \$19,500.

8 It's unfortunate that you didn't send those
9 documents in or communicate in or submit evidence or
10 argument or respond to motions in this proceeding. And
11 I -- it is too late for me to receive any new evidence
12 right now, other than what we've heard today. Next time
13 this happens -- well, not next time it happens. Let's
14 hope it doesn't happen ever again.

15 MR. ADAMS: Exactly. And if it does, I
16 understand that I -- I should have hired an attorney.

17 THE COURT: That probably would have been a
18 good idea. And if not, probably you should have read
19 some of the communications from the EPA more closely
20 before, as -- as you put it in our phone conversation
21 yesterday, before it got to this point.

22 Finally, just another piece of gratuitous
23 advice, you might want to talk to the State and -- and
24 try to get that archaeological clearance, and maybe do
25 whatever it takes at this point to keep your site from

1 contaminating that creek every time it rains.

2 Whatever decision gets issued here on
3 liability will just be for these two instances. You do
4 face potential liability in the future, should it be
5 pursued. I'm not saying it will be or anything, but it
6 would -- Osage County, I'm sure -- your story about
7 bringing in the contaminated water from another creek
8 rang very true to me.

9 Osage County has been producing oil for
10 over 100 years now. And I'm sure there are many, many
11 creeks that have been historically contaminated with
12 brine spills in Osage County. It's unfortunate that
13 there's been another one, but thank you for your
14 participation today. I assume there's no -- you don't
15 want to have any closing arguments, Ms. Dixon, or do
16 you?

17 MS. DIXON: No, sir.

18 THE COURT: Would you like to make any
19 closing arguments, Mr. Adams?

20 MR. ADAMS: No, sir.

21 THE COURT: Okay. With that, I'm going to
22 take this under advisement. I will issue a decision, if
23 necessary, after I receive a copy of the transcript.
24 Meantime, if you and Ms. Dixon wish to continue
25 discussing settlement, that is certainly an option. And

1 with that, these proceedings are closed.

2 (End of proceedings at 10:49 a.m.)

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1 THE STATE OF TEXAS)

2 COUNTY OF DALLAS)

3 I, Donna Trotman, Certified Shorthand Reporter
4 in and for the State of Texas, do hereby certify that
5 the above and foregoing contains a true and correct
6 transcription of all portions of evidence and other
7 proceedings in the above-styled and numbered cause, all
8 of which occurred and were reported by me.

9 I further certify that this transcription of
10 the proceedings truly and correctly reflects the
11 exhibits, if any, admitted by the respective parties.

12 WITNESS MY OFFICIAL HAND this the
13 2nd day of December, 2011.

14
15 

16 Donna Trotman, Texas CSR 9023
17 Expiration Date: 12/31/13
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INTERIM CLEAN WATER ACT SETTLEMENT PENALTY POLICY

March 1, 1995

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ATTACHMENT 1 -- Examples of How to Calculate Statutory Maximum Penalty

ATTACHMENT 2 -- Settlement Penalty Calculation Worksheet



I. INTRODUCTION

Section 309 of the Clean Water Act (CWA), (33 U.S.C. §1319) authorizes the Administrator of the U.S. Environmental Protection Agency ("EPA" or "Agency") to bring civil judicial and administrative actions against those who violate certain enumerated requirements of the CWA. In such actions the Administrator may seek civil penalties.

EPA brings enforcement actions to require alleged violators to promptly correct the violations and remedy any harm caused by the violations. As part of an enforcement action, EPA also seeks substantial monetary penalties which promote environmental compliance and help protect public health by deterring future violations by the same violator and deterring violations by other members of the regulated community. Penalties help ensure a national level playing field by ensuring that violators do not obtain an unfair economic advantage over competitors who have done whatever was necessary to comply on time. Penalties also encourage companies to adopt pollution prevention and recycling techniques, so that they minimize their pollutant discharges and reduce their potential liabilities.

This Policy implements the Agency's February 1984 general *Policy on Civil Penalties* (#GM-21) and the companion document, *A Framework for Statute Specific Approaches to Penalty Assessments* (#GM-22), both issued on February 16, 1984. This Policy revises and hereby supersedes the *Clean Water Act Penalty Policy for Civil Settlement Negotiations* issued on February 11, 1986.¹

This document sets forth the policy of the EPA for establishing appropriate penalties in settlement of civil judicial and administrative actions. Subject to the circumstances of a particular case, this policy provides the lowest penalty figure which the Federal Government should accept in a settlement. This Policy is drafted so that violators whose actions, or inactions, resulted in a significant economic benefit and/or harmed or threatened public health or the environment will pay the highest penalties. Obviously, where settlement is not possible, the Government reserves the right to seek penalties up to the statutory maximum.

II. PURPOSE

¹ The guidances issued to interpret and supplement the 1986 Penalty Policy are also superseded. These documents are the: Addendum to the Clean Water Act Civil Penalty Policy for Administrative Penalties, issued August 28, 1987; Guidance on Penalty Calculations for POTW Failure to Implement an Approved Pretreatment Program, issued December 22, 1988; Bottomline Penalties for Cases Involving More than Five Years of Non-Compliance, issued May 11, 1992; Gravity Penalty Pilot Policy for Clean Water Act Cases, issued November 12, 1992; and Final Interim Guidance on Use of Litigation Consideration Reductions in the Clean Water Act Penalty Policy, issued October 10, 1993 (which incorporated the November 1992 Gravity Penalty Pilot Policy).

The purpose of this Policy is to further four important environmental goals. First, penalties should be large enough to deter noncompliance. Second, penalties should help ensure a level playing field by ensuring that violators do not obtain an economic advantage over their competitors. These two goals generally require that penalties recover the economic benefit of noncompliance, plus an appropriate gravity amount. Third, CWA penalties should be generally consistent across the country. This is desirable as it not only prevents the creation of "pollution havens" in different parts of the nation, but also provides fair and equitable treatment to the regulated community wherever they may operate. Fourth, settlement penalties should be based on a logical calculation methodology to promote swift resolution of enforcement actions and the underlying violations.

III. APPLICABILITY

This Policy applies to all CWA civil judicial and administrative actions filed after the effective date of this Policy, and to all such pending cases in which the government has not yet transmitted to the defendant or respondent an oral or written proposed settlement penalty amount. This Policy also may be applied (instead of the 1986 version) in pending cases in which penalty negotiations have commenced if application of this Policy would not be disruptive to the negotiations. This Policy applies to civil judicial and administrative penalties sought under CWA §309, including: violations of NPDES permit limits and conditions; discharges without an NPDES permit; violations of pretreatment standards and requirements (including local limits and pretreatment programs); violations of §405 sludge use or disposal requirements; violations of §308 information requests; and violations of §309(a) compliance orders. This Policy does not apply to actions brought exclusively under CWA §311 (oil and hazardous substance spills) nor for violations of requirements in §404 ("wetlands" cases involving disposal of dredged or fill material). Separate penalty policies apply to these two types of cases.

This Policy sets forth how the Agency generally expects to exercise its enforcement discretion in deciding on an appropriate enforcement response and determining an appropriate settlement penalty. In some cases, the calculation methodology set forth here may not be appropriate, in whole or part; in such cases, with the advance approval of the Assistant Administrator, an alternative or modified approach may be used.

This Policy only establishes how the Agency expects to calculate the minimum penalty for which it would be willing to settle a case. The development of the penalty amount to plead in an administrative or judicial complaint is developed independent of this Policy, except that the Agency may not seek a settlement penalty in excess of the statutory maximum penalty for the violations alleged in the complaint. This Policy is not intended for use by EPA, violators, courts, or administrative judges in determining penalties at a hearing or trial. (Also see §VI below).

A settlement penalty calculation is generally required before the Agency files an administrative complaint or refers a civil action to the Department of Justice. The penalty

calculation should be revised as relevant new information is discovered during the course of the litigation. The penalty calculation should be reviewed periodically (e.g., on the anniversary of when the complaint was filed) to determine if any revisions to the calculation are necessary.

IV. PENALTY CALCULATION METHODOLOGY

Before proceeding to calculate the settlement penalty, Agency staff should estimate the statutory maximum penalty in order to determine the potential maximum penalty liability of the discharger.² The penalty which the government seeks in settlement may not exceed this statutory maximum amount. Examples of how to calculate the statutory maximum are set forth in Attachment 1. In general, the statutory maximum penalty for violations of an effluent limit for a period longer than one day includes a separate penalty for each day in the time period (assuming there was a discharge on each day).

The settlement penalty is calculated based on this formula:

Penalty = Economic Benefit + Gravity +/- Gravity Adjustment Factors - Litigation Considerations - Ability to Pay - Supplemental Environmental Projects.

Each component of the penalty calculation is discussed below. A worksheet summarizing the penalty calculation is included as Attachment 2.

A. Economic Benefit

Consistent with EPA's February 1984 *Policy on Civil Penalties*, every effort should be made to calculate and recover the economic benefit of noncompliance. The objective of the economic benefit calculation is to place violators in the same financial position as they would have been if they had complied on time. Persons that violate the CWA are likely to have obtained an economic benefit as a result of delayed or completely avoided pollution control expenditures during the period of noncompliance. Commonly delayed and avoided CWA pollution control expenditures, include, but are not limited to:

- o Monitoring and Reporting (including costs of the sampling and proper laboratory analysis);
- o Capital equipment improvements or repairs, including engineering design, purchase, installation, and replacement;

² This calculation of the statutory maximum penalty, done as part of the settlement penalty calculation, is a legal evaluation, subject to the attorney-work product privilege. This calculation is not intended for use in court.

- o Operation and maintenance expenses (e.g. labor, power, chemicals) and other annual expenses; and
- o One-time acquisitions (such as land purchase).

The standard method in settlement efforts for calculating the economic benefit from delayed and avoided pollution control expenditures is through the use of the Agency's BEN model. Refer to the "BEN User's Manual" (Office of Enforcement, December 1993, or any subsequent revision) for specific information on the operation and proper use of BEN. There is no minimum amount triggering the use of the BEN model. In estimating economic benefit using the BEN model, the benefit should be calculated from the first date of noncompliance, but EPA generally does not go back no more than five years prior to the date when the complaint should be filed.³

The BEN model will produce a valid estimate of the economic benefit from delayed and avoided compliance costs only if it is properly used.⁴ Before using the BEN model you need a defensible theory of on-time compliance: that is, the pollution control system or measures the violator should have installed and operated earlier to have prevented the CWA violations at issue in the case.⁵ As a general rule, the best evidence of what the violator should have done to prevent the violations, is what it eventually does (or will do) to achieve compliance.⁶

In some cases, the BEN model may not be an appropriate methodology for estimating economic benefit or will not capture the full scope of the economic benefit. For example, if the violator is a privately-owned regulated utility, the standard BEN model may not be appropriate. In this situation, the Agency should consider a wrongful profits analysis and seek to recover the profits and other competitive market benefits the violator obtained as a result of operating during the period of violation.⁷ In another type of case, if the violator decides that its "method of

³ The five year guideline for when the BEN and gravity calculations starts is a policy decision. Legally, there is nothing that prevents EPA from calculating economic benefit or gravity from the first date of violation, even if that is more than five years before the complaint is filed, as long as the statutory maximum penalty (calculated pursuant to the five year statute of limitations) exceeds the settlement penalty amount.

⁴ The BEN model does not calculate the "competitive advantage" benefits a firm may have obtained as a result of operating in violation of the law. Such benefits include profits and increases in market share from selling goods and services during the period of violation.

⁵ The BEN model is comparing the compliance costs the violator would have paid if it had complied on-time, versus the usually smaller compliance costs it actually pays by complying late.

⁶ See BEN User's Manual, December 1993, page 6-2.

⁷ Regions should consult Headquarters for how to conduct this analysis; a financial consultant is likely to be needed.

compliance" is to cease operations at the facility, conducting a BEN analysis may be complicated.⁸ In a few unusual cases, economic benefit may be negative: this means, e.g., operating the old inefficient treatment system was more expensive than purchasing and operating a new, more efficient treatment system. When economic benefit is negative, the settlement calculation enters zero as the economic benefit.

B. Gravity Component

The gravity calculation methodology is based upon a logical scheme and criteria that quantifies the gravity of the violation based upon the CWA and its regulatory programs. Every reasonable effort must be made to calculate and recover a gravity component in addition to the economic benefit component. As EPA's February 1984 *Policy on Civil Penalties*, states on page 4:

The removal of the economic benefit of noncompliance only places the violator in the same position as he would have been if compliance had been achieved on time. Both deterrence and fundamental fairness require that the penalty include an additional amount to ensure that the violator is economically worse off than if [he] had obeyed the law.

The gravity component of the penalty is calculated for each month in which there was a violation. The total gravity component for the penalty calculation equals the sum of each monthly gravity component. The monthly gravity formula is:

$$\text{Monthly gravity component} = (1 + A + B + C + D) \times \$1,000.$$

The four gravity factors -- A, B, C, and D -- are considered for each month in which there were one or more violations. Values are assigned to each of the four factors as described in the text and tables below. In performing the gravity calculation, the monthly gravity component is calculated from the first date of noncompliance up to when the violations ceased or the date the complaint is expected to be filed, but EPA has the option to start the gravity calculation no more than five years prior to the date when the complaint should be filed. (See footnote #4.) In cases with continuing violations, the gravity calculation should be revised periodically to include additional months of violations that have occurred since the previous calculation.

⁸ In cases where a facility determines that it can only comply by ceasing operations, an appropriate BEN analysis would be to input the savings obtained from the delayed closure costs and the avoided costs of not treating the wastewater during the period of noncompliance. See Appendix B in BEN User's Manual. If it is not possible to estimate these avoided treatment costs, then a wrongful profit analysis is necessary.

"A" -- Significance of Violation (Monthly Range 0 to 20). This factor is based on the degree of exceedance of the most significant effluent limit violation in each month. Values for this factor are selected from within designated ranges; violations of toxic monthly effluent limits are weighted most heavily. Values are selected using the table below based on the effluent value which yields the highest factor A value. Regions select a particular value for factor A within the designated range. For purposes of this table conventional and nonconventional pollutants include biochemical oxygen demand, chemical oxygen demand, total oxygen demand, dissolved oxygen, total organic carbon, total suspended solids, total dissolved solids, inorganic phosphorous compounds, inorganic nitrogen compounds, oil and grease, calcium, chloride, fluoride, magnesium, sodium, potassium, sulfur, sulfate, total alkalinity, total hardness, aluminum, cobalt, iron, vanadium and temperature. Factor A values for fecal coliform and pH, which are calculated using logarithmic scales, are calculated using the special scales at the bottom of the table. All other pollutants are classified as toxic pollutants.

If there were no effluent limit violations in a particular month, but there were other violations, then factor A is assigned a value of zero in that month's gravity calculation. In pretreatment cases in which the industrial user was not required to provide monthly compliance reports, and provided less frequent effluent data (e.g., in a 40 CFR §403.12(e) periodic compliance report), any effluent violations reported in the report are assumed to represent identical violations in each month of the reporting period for purposes of calculating gravity if there is substantial evidence supporting this assumption. Examples of such evidence are: (1) no pretreatment equipment was in operation during the period and (2) the production and treatment operations remained consistent during the period. This means the monthly gravity calculation, with a factor A value, should be repeated for all of the months covered by the report.⁹ If there was no evidence indicating continuing violations throughout the period covered by the periodic compliance report, then a value for Factor A should be assigned only for the month in which the sampling occurred. If the industrial user did not notify the control authority and repeat the sampling after finding the effluent violation as required by 40 CFR §403.12(g)(2), then an appropriate value for gravity Factor D should be assigned for this notification or monitoring violation(s).

⁹ The pretreatment regulations, 40 CFR §403.12(g)(3), require the periodic compliance reports to contain data which "is representative of conditions occurring during the reporting period." For example, if an industrial user reports in its December (semi-annual) periodic compliance report that it violated the daily maximum cadmium limit by 150% in September, and this was the most significant effluent violation, using the Gravity Factor A Table, factor A will be assigned a value between 3 and 7 for each of the six months covered by the report (July - December) if, e.g., EPA had evidence that the facility lacked treatment equipment during that period and wastewater generating operations were consistent during the period.

GRAVITY FACTOR A -- SIGNIFICANCE OF THE VIOLATION				
Select a value for factor A based on the effluent limit violated in the month which produces the highest range of values for factor A.				
Percent by which effluent limit was exceeded:			Factor A Value Ranges	
Monthly Average	7-day Average	Daily Maximum	Toxic Pollutants	Conventional & Nonconventional Pollutants
1 - 20	1 - 30	1 - 50	1 - 3	0 - 2
21 - 40	31 - 60	51 - 100	1 - 4	1 - 3
41 - 100	61 - 150	101 - 200	3 - 7	2 - 5
101 - 300	151 - 450	201 - 600	5 - 15	3 - 6
301 - >	451 - >	601 - >	10 - 20	5 - 15
Percent Exceedance of Fecal Coliform Limit:		Standard Units above or below pH limit:	Factor A Value Ranges:	
0 - 100		0 - .50	0 - 5	
101 - 500		.51 - 2.0	2 - 8	
501 - 5,000		2.01 - 3.0	4 - 10	
5,001 - >		3.01 - 4.0	6 - 12	
		4.01 - >	8 - 15	

"B" -- Health and Environmental Harm (Monthly Range 0 to 50). A value for this factor is selected for each month in which one or more violations present actual or potential harm to human health or to the environment. Values are selected using the table below based on the type of actual or potential harm that yields the highest factor value.

GRAVITY FACTOR B – HEALTH AND ENVIRONMENTAL HARM	
Type of Actual or Potential Harm	Factor B Value Ranges
Impact on Human Health (e.g., interference with drinking water supplies, harm or increased risks to subsistence fishing)	10 - 50
Impact on Aquatic Environment (or the POTW)	
Water quality-based effluent standard(s) or whole effluent toxicity limit violated	1 - 10
Fish kill, beach closing, restrictions on use of water body; or pass through or interference at the POTW caused by the IU discharge.	4 - 50
Other impact on aquatic environment	2 - 25

"C" -- Number of Effluent Limit Violations (Monthly Range 0 to 5). This factor is based on the total number of effluent limit violations each month. (Violations of interim limitations in administrative orders are not counted here, but included as part of recalcitrance.) In order to properly quantify the gravity of the violations, all effluent limit violations are considered and evaluated. Violations of different parameters at the same outfall are counted separately and violations of the same parameter at different outfalls are counted separately. The guidelines in Attachment 1 for calculating the statutory maximum penalty are generally not applicable for selecting the value for gravity factor C (e.g., violation of a weekly limit need not be calculated as 7 separate violations). A minimum factor C value of 1 is generally appropriate whenever there are violations of two or more different pollutants. Values for this factor may be selected by comparing the number of effluent limits exceeded with the number of effluent limits in the permit: e.g., if all of the limits in the permit were violated in a month, a value of 5 would be appropriate; if 50 percent of the limits in the permit were violated, a factor of 2 or 3 would be appropriate.

"D" -- Significance of Non-effluent Limit Violations. This factor has a value ranging from 0 (zero) to 70 and is based on the severity and number of the six different types of non-effluent limitation requirements violated each month. There are six types of non-effluent violations: 1) monitoring and reporting; 2) pretreatment program implementation; 3) sludge handling; 4) unauthorized discharges; 5) permit milestone schedules; and 7) other types of non-effluent violations. The value for factor D for each month in which there is a non-effluent limit violation is selected pursuant to the table on the next page. The factor D value for a given month is the sum of the highest value for each type of non-effluent limit violation.

With regards to monitoring and reporting violations, the failure to submit a report in a timely manner should generally not be treated as a continuing violation past the month in which the report is due. For example, if an industrial user fails to submit a baseline monitoring report as required by 40 CFR 403.12(b), this should be counted as a violation only in the month when the

report was due. Given the importance of such a report, if the violator fails to submit the report at all a factor D value of 5 or more may be appropriate for this violation.¹⁰

With regards to pretreatment program implementation violations, "key program activities" include: identifying all industrial users; issuing appropriate control mechanisms to all significant industrial users (SIUs); inspecting SIUs; enforcing industrial user self-monitoring; enforcing pretreatment standards (including local limits); submitting pretreatment reports to the approval authority; and failing to comply with other significant pretreatment program obligations. The 1989 *Guidance for Reporting and Evaluating POTW Noncompliance with Pretreatment Requirements* or subsequent revisions may be helpful in evaluating the seriousness of pretreatment program implementation violations.

As an example of calculating factor D for a given month, assume a discharger did not sample for 4 of the 8 parameters in its permit, the discharge monitoring report was submitted 20 days late, and there were several days of discharge of a process wastestream through an unauthorized outfall without any treatment. Using the factor D table, for Type 1, a value of 4 may be selected based on the failure to conduct sampling for half of the parameters; the delay in submitting sampling data is not considered since the other Type 1 violation produces a higher value. For the unauthorized discharge of the process wastestream, a value of 6 may be selected for Type 4. Since there are no Type 2, 3, 5, and 6 violations, a value of 0 is entered for each of these Types. Thus, the total value for factor D for this month is 10.

¹⁰ The failure to provide the regulatory agency with required sampling data on the discharge is a very serious violation as this eliminates the government's ability to perform necessary oversight and allows the discharger to avoid the possible application of gravity factor A.

GRAVITY FACTOR D -- NON-EFFLUENT LIMIT VIOLATIONS	
THE FACTOR D VALUE FOR A GIVEN MONTH IS THE SUM OF THE HIGHEST VALUE FOR EACH TYPE OF NON-EFFLUENT LIMIT VIOLATION.	
Type and Extent of Violation	Factor D Value Ranges
1. Effluent Monitoring and Reporting Violations:	
Failure to conduct or submit adequate pollutant sampling data for 1 or more pollutant parameters (but not all parameters)	1 to 6
Failure to conduct or submit any required pollutant sampling data in a given month but with a reasonable belief that the facility was in compliance with applicable limits.	2 to 6
Failure to conduct or submit any required pollutant sampling data in a given month without a reasonable basis to believe that facility was otherwise in compliance with applicable limits.	6 to 10
Failure to conduct or submit whole effluent toxicity sampling data	4 to 10
Delay in submitting sampling data	0 to 5
Failure to submit a pretreatment baseline report, 90-day compliance report, or periodic compliance report (40 CFR 403.12(b), (d), or (e),) or failure to sample again after finding a violation (40 CFR 403.12(g)(2)).	2 to 8
Any other monitoring or reporting violation	0 to 10
2. Pretreatment Program Implementation Violations :	
All key program activities implemented, with some minor violations.	0 to 4
One or two key program activities not implemented	2 to 6
Many key program activities not implemented	4 to 8
Few if any program activities implemented	6 to 10
3. Failure to properly control, treat, or dispose of sludge	1 to 10
4. Unauthorized discharge: e.g., discharge through an unpermitted outfall, discharge of a wastestream not identified in the permit, sewer overflows, or spill (other than oil or §311 hazardous substance)	1 to 20
5. Violation of permit milestone schedule	1 to 10
6. Any other type of noneffluent limit violation	1 to 10

C. Gravity Adjustment Factors

In certain circumstances as explained below, the total monthly gravity amount may be adjusted by three factors: flow reduction factor (to reduce gravity); history of recalcitrance (to increase gravity); and the quick settlement reduction factor (to reduce gravity). The resulting figure -- benefit + (gravity +/- gravity adjustments) -- is the preliminary penalty amount.

Flow Reduction Factor for Small Facilities. The total monthly gravity amount may be reduced based on the flow of the facility. This factor is applicable to direct and indirect discharges, both municipal and non-municipals. Flow reduction percentages are selected using the table below. In order to ensure that these reductions are directed at small facilities (that are not otherwise part of large corporation), this gravity reduction does not apply to non-municipals if the facility or parent corporation employs more than 100 individuals.

FLOW REDUCTION FACTOR	
AVERAGE DAILY WASTEWATER DISCHARGE FLOW (in gallons per day)	PERCENTAGE REDUCTION FACTOR OF TOTAL GRAVITY
Less than 5,000	50
Between 5,000 and 9,999	40
Between 10,000 and 19,999	30
Between 20,000 and 29,999	20
Between 30,000 and 49,999	10
Between 50,000 and 99,999	5
100,000 and above	0 (i.e., no reduction)

History of Recalcitrance Adjustment Factor. The "recalcitrance" factor is used to increase the penalty based on a violator's bad faith, or unjustified delay in preventing, mitigating, or remedying the violation. Recalcitrance is also present if a violator failed to comply with an EPA issued administrative compliance order or a §308 information request, or with a prior state or local enforcement order. This factor is applied by multiplying the total gravity component by a percentage between 0 and 150. In administrative penalty actions, violations of administrative compliance orders are not included in the recalcitrance calculation (because EPA lacks the authority to seek penalties in the administrative forum for violations of administrative compliance orders).

A minimum recalcitrance factor of 10 percent is generally appropriate for each instance in which a violator fails to substantially comply in a timely manner with an administrative compliance

order ("AO"), a §308 information request, or a state enforcement order. Thus, if a particular discharger violated 3 AOs, a minimum recalcitrance factor of 30 percent is generally appropriate. If a violator completely fails to comply with an AO or §308 request, a recalcitrance factor of 20 percent may be appropriate for that failure, while if there were only minor violations of the AO or request, a recalcitrance factor of 5 percent may be appropriate for that violation.

Quick Settlement Adjustment Factor. In order to provide an extra incentive for violators to negotiate quickly and reasonably, and in recognition of a violator's cooperativeness, EPA may reduce the gravity amount by 10 percent if EPA expects the violator to settle quickly. For purposes of this reduction factor, in Class I administrative enforcement actions, a quick settlement is when the violator signs an administrative consent order resolving the violations within four months of the date the complaint was issued or within four months of when the government first sent the violator a written offer to settle the case, whichever date is earlier. In Class II administrative enforcement actions and judicial cases, the controlling time period is 6 and 12 months, respectively. If the violator is not able to sign the consent order within this time period, this adjustment does not apply.

Environmental Auditing Adjustment Factor. This interim revision of the Penalty Policy contains no explicit gravity adjustment factor for violators that conduct, or fail to conduct, environmental audits, disclose the results to the government, promptly correct the violations and remedy any harm. This interim revision of the Policy (and the original 1986 version), however, automatically produces smaller penalty amounts for violators who promptly remedy violations. This is because violators who promptly remedy violations will have shorter histories of violations and this automatically reduces both the economic benefit and gravity amounts. After the Agency completes its review of its environmental auditing policy, this Policy may be reissued with an explicit adjustment factor for this factor. In the interim, Regions, may with the advance approval of Headquarters, appropriately adjust the gravity amount based on the presence, or absence, of an environmental auditing program.

D. Litigation Considerations (to decrease preliminary penalty amount)

1. Overview. The government should evaluate every penalty with a view toward litigation and attempt to ascertain the maximum civil penalty the court or administrative judge is likely to award if the case proceeds to trial or hearing. Many enforcement cases may have mitigating factors, weaknesses or equitable problems that could be expected to persuade a court to assess a penalty less than the statutory maximum amount. The simple existence of weaknesses in a case, however, should not automatically result in a litigation consideration reduction of the preliminary bottom-line settlement penalty amount (economic benefit + gravity \pm gravity adjustment factors). The government may reduce the amount of the civil penalty it will accept at settlement to reflect weaknesses in its case where the facts demonstrate a substantial likelihood that the government will not achieve a higher penalty at trial.

2. Legal Evaluation. The mere existence of weaknesses or limitations in a case should not result in a reduction of the preliminary bottom-line settlement penalty amount, unless the Agency determines that the preliminary settlement amount is more than EPA is likely to obtain at trial.¹¹ In evaluating potential litigation consideration reductions, EPA legal staff should: (a) Determine the statutory maximum penalty; (b) Evaluate what penalty the court might assess at trial given the particular strengths and weaknesses of the case; and, (c) Compare this amount to the preliminary settlement amount (benefit + gravity + recalcitrance).

While Agency legal staff cannot predict the exact penalty amount a court might assess at trial, case law indicates that a court should use the statutory maximum as its preliminary penalty figure, and then reduce that amount, as appropriate, using only the penalty assessment factors in §309(d) of the Act. Fitting the facts of EPA's enforcement case to the method adopted by the courts in recent CWA penalty decisions provides the Agency with the clearest method to estimate penalty litigation outcomes.¹²

3. Application. Adjustments for litigation considerations are taken on a factual basis specific to the case. Before a complaint is filed, the application of certain litigation considerations is almost always premature, since the Agency generally does not have enough information to fully evaluate litigation risk regarding the assigned judge's previous ruling on similar matters, the court's informed opinion, or witness performance. Other litigation considerations, including evidentiary matters, witness availability, and equitable defenses often may not be reliably demonstrated until after case filing. Reductions for these litigation considerations are more likely to be appropriate after the Agency obtains an informed view, through discovery and settlement activities, of the strengths and weaknesses in its case and how the specific court views penalties in the case. Pre-filing settlement negotiations are often helpful in identifying and evaluating litigation considerations, especially regarding potential equitable defenses, and thus reductions based on such litigation considerations may be appropriately taken before the complaint is filed. As a general rule, the greater the disparity between the maximum statutory penalty and the preliminary penalty amount, the less litigation considerations should affect the Agency's settlement position.

¹¹ In many situations, weaknesses or limitations in a case are already accounted for in the preliminary penalty calculation. For example, the gravity calculation will be less in those circumstances in which the period of violation was brief, the exceedances of the limitations were small, the pollutants were not toxic, or there is no evidence of environmental harm. The economic benefit calculation also will be smaller when the violator has already returned to compliance since the period of violation will be shorter.

¹² The prevailing CWA case law on the assessment of penalties indicates that, in assessing a penalty, a court begins at the statutory maximum amount and reduces the penalty based on the specific factors set out in section 309(d) of the CWA. See Atlantic States Legal Foundation v. Tyson Foods, 897 F.2d 1128 (11th Cir. 1990). In contrast, settlement penalties calculated pursuant to this Policy build the Agency's bottom line negotiating position upward from zero, generally ending up with a figure orders of magnitude less than the statutory maximum penalty.

4. Possible Litigation Considerations. While there is no universal list of litigation considerations, the following factors may be appropriate in evaluating whether the preliminary settlement penalty exceeds the penalty the Agency would likely obtain at trial:

- a. Known problems with the reliability or admissibility of the government's evidence proving liability or supporting a civil penalty;
- b. The credibility, reliability, and availability of witnesses;¹³
- c. The informed, expressed opinion of the judge assigned to the case (or person appointed by the judge to mediate the dispute), after evaluating the merits of the case.¹⁴
- d. The record of the judge in any other environmental enforcement case presenting similar issues. (In contrast, the reputation of the judge, or the judge's general demeanor, without a specific penalty or legal statement on a similar case, is rarely sufficient as a litigation consideration.)
- e. Statements made by federal, State or local regulators that may allow the respondent or defendant to credibly argue that it believed it was complying with the federal law under which EPA is seeking penalties.
- f. The payment by the defendant of civil penalties for the same violations in a case brought by another plaintiff.¹⁵
- g. The development of new, relevant case law.

¹³ The credibility and reliability of witnesses relates to their demeanor, reputation, truthfulness, and impeachability. For instance, if a government witness has made statements significantly contradictory to the position he is to support at trial, his credibility may be impeached by the respondent or defendant. The availability of a witness will affect the settlement bottom-line if the witness cannot be produced at trial; it does not relate to the inconvenience or expense of producing the witness at trial.

¹⁴ This factor, except as provided below with respect to the record of the judge or other trier of fact, may not be applied in anticipation, or at the stage of initial referral, and should not be distorted by taking at face value what a judge attempting to encourage a settlement might say.

¹⁵ If the defendant has previously paid civil penalties for the same violations to another plaintiff, this factor may be used to reduce the amount of the settlement penalty by no more than the amount previously paid for the same violations. (If the previous plaintiff was a State qualified to preempt federal enforcement under EPA's interpretation of Section 309(g)(6), EPA's complaint should not include counts already addressed by a penalty. See "Supplemental Guidance on Section 309(g)(6) (A) of the Clean Water Act," memorandum from Frederick F. Stiehl, Enforcement Counsel for Water, to Regional Counsels, March 5, 1993, and "Guidance on State Action Preempting Civil Penalty Enforcement Actions Under the Federal Clean Water Act, OE/OW, August 28, 1987.)

h. A blend of troublesome facts and weak legal arguments such that the Agency faces a significant risk of obtaining a nationally significant negative precedent at trial.

5. Not Litigation Considerations. In contrast to the above list of possible litigation considerations, the following items are not litigation considerations:

a. A generalized goal to avoid litigation or to avoid potential precedential areas of the law.¹⁶

b. A duplicative use of elements included or assumed elsewhere in the Penalty Policy, such as inability to pay, "good faith"¹⁷, "lack of recalcitrance", or a lack of demonstrated environmental harm¹⁸.

c. Off-the-record statements by the court, before it has had a chance to evaluate the specific merits of the case are, by themselves, not a reason to reduce the preliminary settlement penalty amount. (Compare with 4.c above.)

d. The fact that the receiving water is already polluted or that the water can assimilate additional pollution is not a litigation consideration.¹⁹

e. By itself, the failure of a regulatory agency to initiate a timely enforcement action is not a litigation consideration.²⁰

¹⁶ A generalized desire to minimize litigation costs is not a litigation consideration.

¹⁷ The efforts of the violator to achieve compliance or minimize the violations after EPA, a State or pretreatment control authority has initiated an enforcement action (i.e., an administrative or judicial enforcement action) do not constitute "good faith" efforts. If such efforts are undertaken before the regulatory agency initiates an enforcement response, the settlement penalty calculation already includes such efforts through a potentially smaller economic benefit amount, a shorter or less serious gravity component, or a lack of any recalcitrance. The Penalty Policy assumes all members of the regulated community will make good faith efforts both to achieve compliance and remedy violations when they occur; consequently the settlement penalty calculation begins at zero and builds upward, with no reductions for good faith. In contrast, the absence of good faith efforts provides the basis for increasing the penalty through use of the recalcitrance factor.

¹⁸ The gravity calculation will reflect the lack of environmental harm. Courts have considered the extent of environmental harm associated with violations in determining the "seriousness of violations" pursuant to the factors in §309(d), and have used the absence of any demonstrated or discrete identified environmental harm to impose less than the statutory maximum penalty. Proof of environmental harm, however, is neither necessary for liability nor for the assessment of penalties.

¹⁹ See, e.g., Natural Resources Defense Council v. Texaco Refining and Mktg., 800 F. Supp. 1, 24 (D. Del. 1992).

²⁰ See PIRG v. Powell Duffryn, 913 F. 2d 64, 80-81 (3rd Cir. 1990).

6. Approval of Litigation Considerations. The Agency recognizes that the quantitative evaluation of litigation considerations often reflects subjective legal opinions. Therefore, EPA Regions may reduce the preliminary penalty amount for litigation considerations for up to one-third of the net gravity amount (i.e., gravity as modified by the gravity adjustment factors) without Headquarters approval (where such approval would otherwise be required). Of course, such a reduction must be fully explained and maintained in the case file. This reduction is not applicable in municipal cases in which the tables in D.7 below are used.

7. Municipal Cases. In those cases against a municipality or other public entity (such as a sewer authority) in which the entity has failed to comply with the Clean Water Act but nevertheless did make good faith efforts to comply, the Agency may mitigate the preliminary penalty amount based on this national municipal litigation consideration. The preliminary penalty amount (economic benefit + gravity \pm gravity adjustments) may be mitigated to no less than the cash penalty determined by operation of the two tables set forth below. In addition, the cash penalty amount established by the tables may be reduced based on compelling ability to pay considerations and by up to 40 percent for appropriate supplemental environmental projects. Reducing the cash penalty below the amount established by the national municipal litigation consideration (other than for ability to pay considerations or for 40 percent based on a SEP) requires compelling evidence of other considerations and the prior approval of Headquarters (even if Headquarters' approval of the settlement would otherwise not be required).

The national municipal litigation consideration is a discretionary factor and the Agency is under no obligation to use it in all municipal cases.²¹ It should only be used if there is some evidence that the municipality made a good faith effort to comply. The national municipal litigation consideration is based on the economic benefit, environmental impact, duration and size of the facility, and is derived, in part, on the settlement penalties EPA has obtained from judicial municipal cases settled between October 1988 and December 1993. There are three steps to calculate a penalty using the national municipal litigation consideration tables.

1. Using Table A determine the economic benefit environmental impact factor amount. This dollar amount is found by selecting an appropriate value from the range in the appropriate cell in Table A. The economic benefit is the benefit previously calculated pursuant to section IV.A. above. Impact of the violations is based on the actual or potential (risk) of harm caused, in whole or part, by the violations.
2. Using Table B determine the population months of violations factor amount. This dollar amount is found by selecting an appropriate value from the range in the appropriate cell in Table B. The service population is the total population served by the violating

²¹ The national municipal litigation consideration is primarily intended to apply in cases in which there has been a failure to timely construct treatment facilities or other capital projects; it may not be appropriate in pretreatment failure to implement cases.

POTW(s) during the period. The months of violation are the total number of months calculated pursuant to section IV.B above. (If the service population exceeds 3 million, the Table B value is found by combining values from multiple rows. For example, if the service population was 4.5 million, the factor B penalty contribution would be the sum of a value selected from the appropriate cell in the 1,000,001 to 2,000,000 population row plus a value selected from the appropriate cell in the 2,000,001 to 3,000,000 population row.)

3. Sum the selected factor values from Tables A and B. Note that the factor values in Tables A and B are in thousands of dollars.

NATIONAL MUNICIPAL LITIGATION CONSIDERATION -- TABLE A

ECONOMIC BENEFIT ENVIRONMENTAL IMPACT FACTOR IN THOUSANDS OF DOLLARS		ECONOMIC BENEFIT RANGES IN THOUSANDS OF DOLLARS										
IMPACT OF VIOLATIONS ON HUMAN HEALTH OR THE ENVIRONMENT		.001 to 50	50 to 100	100 to 250	250 to 1,000	1,000 to 2,000	2,000 to 5,000	5,000 to 10,000	10,000 to 25,000	greater than 25,000		
		No actual or potential harm.	6 to 9	11 to 15	17 to 23	32 to 43	49 to 67	75 to 103	110 to 151	167 to 230	283 to 389	
Minor actual or potential harm (e.g., water quality-based effluent or whole effluent toxicity limit violated).	9 to 11	16 to 19	25 to 29	47 to 55	73 to 86	112 to 131	164 to 192	251 to 293	424 to 495			
Moderate actual or potential harm (e.g., fish kill, beach closing, restrictions on use of water body, raw sewage discharges).	13 to 14	22 to 25	33 to 38	63 to 71	98 to 110	150 to 168	219 to 246	335 to 376	566 to 636			
Severe actual or potential harm (e.g., repeated beach closings, interference with drinking water supplies).	17 to 32	30 to 55	46 to 84	87 to 158	135 to 245	206 to 374	301 to 548	460 to 837	778 to 1,414			

NATIONAL MUNICIPAL LITIGATION CONSIDERATION -- TABLE B
 POPULATION MONTHS OF VIOLATION FACTOR IN THOUSANDS OF DOLLARS

SERVICE POPULATION	MONTHS OF VIOLATION											
	1 to 6	7 to 12	13 to 18	19 to 24	25 to 30	31 to 36	37 to 42	43 to 48	49 to 54	55 to 60	61 to 66	66>
100 to 5,000	0 to 0.6	0 to 1.8	0.1 to 3	0.1 to 4.2	0.1 to 5.4	0.1 to 6.6	0.2 to 7.8	0.2 to 9	0.2 to 10.2	0.2 to 11.4	0.3 to 12.6	0.3 to 14
5,001 to 25,000	0.6 to 3	1.8 to 9	3 to 15	4.2 to 21	5.4 to 27	6.6 to 33	7.8 to 39	9 to 45	10.2 to 51	11.4 to 57	12.6 to 63	14 to 70
25,001 to 50,000	3 to 6	9 to 18	15 to 30	21 to 42	27 to 54	33 to 66	39 to 78	45 to 90	51 to 102	57 to 114	63 to 126	70 to 140
50,001 to 100,000	6 to 12	18 to 36	30 to 60	42 to 84	54 to 108	66 to 132	78 to 156	90 to 180	102 to 204	114 to 228	126 to 252	140 to 280
100,001 to 250,000	12 to 30	36 to 90	60 to 150	84 to 210	108 to 270	132 to 330	156 to 390	180 to 450	204 to 510	228 to 570	252 to 630	280 to 700
250,001 to 500,000	30 to 60	90 to 180	150 to 300	210 to 420	270 to 540	330 to 660	390 to 780	450 to 900	510 to 1,020	570 to 1,140	630 to 1,260	700 to 1,400
500,001 to 1,000,000	60 to 120	180 to 360	300 to 600	420 to 840	540 to 1,080	660 to 1,320	780 to 1,560	900 to 1,800	1,020 to 2,040	1,140 to 2,280	1,260 to 2,520	1,400 to 2,800
1,000,001 to 2,000,000	120 to 240	360 to 720	600 to 1,200	840 to 1,680	1,080 to 2,160	1,320 to 2,640	1,560 to 3,120	1,800 to 3,600	2,040 to 4,080	2,280 to 4,560	2,520 to 5,040	2,800 to 5,600
2,000,001 to 3,000,000	240 to 360	720 to 1,080	1,200 to 1,800	1,680 to 2,520	2,160 to 3,240	2,640 to 3,960	3,120 to 4,680	3,600 to 5,400	4,080 to 6,120	4,560 to 6,840	5,040 to 7,560	5,600 to 8,400

E. Ability to Pay (to decrease preliminary penalty amount)

The Agency typically does not request settlement penalties, which combined with the cost of the necessary injunctive relief, that are clearly beyond the financial capability of the violator. This means EPA should not seek a penalty that would seriously jeopardize the violator's ability to continue operations and achieve compliance, unless the violator's behavior has been exceptionally culpable, recalcitrant, threatening to human health or the environment, or the violator refuses to comply.

The adjustment for ability-to-pay may be used to reduce the settlement penalty to the highest amount that the violator can reasonably pay and still comply with the CWA. The violator has the primary burden of establishing the claim of inability to pay. The violator must submit the necessary information demonstrating actual inability to pay as opposed to unwillingness to pay. Further, the claim of inability to pay a penalty should not be confused with a violator's aversion to make certain adjustment in its operations in order to pay the penalty.²²

If the violator is unwilling to cooperate in demonstrating its inability to pay the penalty, this adjustment should not be considered in the penalty calculation, because, without the cooperation of the violator, the Agency will generally not have adequate information to determine accurately the financial position of the violator. In some cases, the Agency may need to consult a financial expert to properly evaluate a violator's claim of inability to pay.

If the violator demonstrates an inability to pay the entire negotiated penalty in one lump sum (usually within 30 days of consent decree entry), a payment schedule should be considered. The penalty could be paid in scheduled installments with appropriate interest accruing on the delayed payments. The period allowed for such installment payments should generally not extend beyond three years.

If a payment schedule will not resolve the violator's ability-to-pay issue, as a last recourse, the Agency can reduce the amount it seeks in settlement to a more appropriate amount in situations in which inability-to-pay can be clearly documented and reasonably quantified.

In the case of municipalities, one quick way to evaluate whether there might be an ability to pay issue is to examine the most recent bond rating (within the past 5 years). If the bond rating is below BBB (Standard & Poor's rating scale) or below Baa (Moody's rating scale), the community may be in poor financial condition and a detailed financial evaluation by an appropriate expert may be necessary to determine whether the financial condition affects the ability to pay a penalty.

²² For example, a business may have to use funds that were previously designated to develop a new product line to pay a penalty and thus the new product line would be delayed. Similarly, a penalty could be paid using company funds that otherwise would have gone to pay its executives bonuses.

V. SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEPs)

Supplemental Environmental Projects (SEPs) are defined by EPA as environmentally beneficial projects which a violator undertakes, but is not otherwise legally required to perform, in exchange for favorable penalty consideration in settlement of an enforcement action. In order for a violator to receive a settlement penalty reduction in exchange for performing such a project, the project must conform with the EPA's SEP Policy, or be approved in advance by the Assistant Administrator²³. A SEP may be allowed in a municipal case, even if the cash penalty is less than economic benefit, provided the cash penalty is no less than 60 percent of the amount provided in section IV.D.7. Use of SEPs in a particular case is entirely within the discretion of EPA, and the Department of Justice in judicial cases.

VI. OTHER TYPES OF PENALTIES

This Policy only establishes how the Agency expects to calculate the minimum penalty for which it would be willing to settle a case. The development of the penalty amount to plead in an administrative or judicial complaint is developed independent of this Policy. This Policy is not intended and should not be used as the basis for a penalty demand in a complaint, an administrative hearing or, a civil judicial trial. The Agency will not use this Penalty Policy in arguing for a penalty at trial or in an administrative penalty hearing.²⁴ In those cases which proceed to trial or an administrative hearing, the Agency should seek a penalty higher than that for which it is willing to settle.

If the "bottom-line" settlement penalty calculated pursuant to this Policy exceeds the maximum penalty that can be obtained in an administrative penalty action pursuant to §309(g) of the CWA, the Agency should instead proceed judicially.²⁵ In rare circumstances, the statutory maximum penalty may be less than the "bottom-line" settlement penalty in civil judicial cases; in such circumstances, the statutory maximum penalty should serve as the new "bottom-line" penalty.

²³ See "EPA Policy on the Use of Supplemental Environmental Projects in Enforcement Settlements", transmitted on February 12, 1991 by the Assistant Administrator for Enforcement, or subsequent revisions.

²⁴ If that were to occur, then the defendant would have no incentive to settle with EPA. See *Guidance on the Distinctions Among Pleading, Negotiating, and Litigating Civil Penalties for Enforcement Cases Under the Clean Water Act*, OECM/OW, January 19, 1989.

²⁵ For further guidance on choosing between administrative and judicial enforcement options, see "Guidance on Choosing Among Clean Water Act Administrative, Civil and Criminal Enforcement Actions", which was Attachment 2 to the August 28, 1987 "Guidance Documents and Delegations for Implementation of Administrative Penalty Authorities Contained in 1987 Clean Water Act Amendments".

VII. DOCUMENTATION, APPROVALS, AND CONFIDENTIALITY

Each component of the settlement penalty calculation (including all adjustments and subsequent recalculations) must be clearly documented with supporting materials and written explanations in the case file. In all cases in which a settlement penalty may not comply with the provisions of this Policy, or in a case in which application of this Policy appears inappropriate, the penalty must be approved in advance by the EPA Assistant Administrator for Enforcement and Compliance Assurance.

Documentation and explanations of a particular settlement penalty calculation constitute confidential information that is exempt from disclosure under the Freedom of Information Act, is outside the scope of discovery, and is protected by various privileges, including the attorney-client privilege and the attorney work-product privilege. While individual settlement penalty calculations are confidential documents, this Policy is a public document and may be released to anyone upon request. Further, as part of settlement negotiations between the parties, the Agency may choose to release parts of the case-specific settlement calculations. The release of such information may only be used for settlement negotiations in the case at hand and, of course, may not be admitted into evidence in a trial or hearing. See Rule 408 of Federal Rules of Evidence.

This Policy is purely for the use of U.S. EPA enforcement personnel in settling cases. EPA reserves the right to change this Policy at any time, without prior notice, or to act at variance to this Policy. This Policy does not create any rights, implied or otherwise, in any third parties.

ATTACHMENT 1 TO INTERIM CWA SETTLEMENT PENALTY POLICY

EXAMPLES OF HOW TO CALCULATE STATUTORY MAXIMUM PENALTY

Violation scenario	Maximum statutory penalty*	Authority
Violation of daily maximum limit for pollutant A, on the 5th of January.	\$25,000	Plain reading of CWA, § 309(d): "\$25,000 per day for each violation"
Violation of daily maximum limit for pollutant A, on the 5th, 10th, and 15th of January.	\$75,000	Plain reading of CWA, § 309(d): "\$25,000 per day for each violation"
Violation of daily maximum limits for each of pollutants A and B, on the 5th of January.	\$50,000	<u>Tyson Foods</u> and <u>Powell Duffryn</u> , as well as plain reading of CWA, § 309(d): "\$25,000 per day for each violation"
Violation in January of weekly average for pollutant A.	\$25,000 per day, multiplied by 7 days \$175,000.	<u>Tyson Foods</u> , 897 F.2d at 1139. Also see, <u>Gwaltney</u> , 897 F. 2d at 314.
Violation in January of monthly average limit for pollutant A.	\$25,000 per day, multiplied by 31 days in January = \$775,000	<u>Tyson Foods</u> , 897 F.2d at 1139. Also see, <u>Gwaltney</u> , 897 F. 2d at 314.
Violation in January of monthly average limit for pollutant A, in which there is evidence that there were no discharges on 4 days (e.g. plant shut down on Sundays).	\$25,000 per day, multiplied by 27 days in January = \$675,000	<u>Natural Resources Defense Council v. Texaco</u> , 2 F.3d 493, 507-508 (3rd Cir. 1993).
Violation in January of monthly average limits for both pollutants A and B.	\$50,000 per day, multiplied by 31 days in January, = \$1,550,000	<u>Tyson Foods</u> , 897 F.2d at 1140, footnote 22
Violation in January of monthly average limit for pollutant A, and of daily maximum limit for pollutant B on January 5th and 15th.	\$775,000 for pollutant A, + \$50,000 (\$25,000 per day x 2) for pollutant B, = \$825,000	<u>Tyson Foods</u> , 897 F.2d at 1140, under "The interaction of daily and monthly violations"
Violation in January of monthly average limit for pollutant A, and of daily maximum limit for pollutant A on Jan. 5th and 15th.	25,000 per day, multiplied by 31 days in January, = \$775,000.	<u>Tyson Foods</u> , 897 F.2d at 1140, under "The interaction of daily and monthly violations"
Failure to properly monitor** for pollutant A on 4 required days in January.	\$100,000.	Statutory language, CWA §309.

Violation scenario	Maximum statutory penalty*	Authority
Failure to properly monitor for pollutants A, B, and C on January 15.	\$75,000.	Statutory language, CWA §309.
Failure to monitor for a monthly pollutant parameter.	\$25,000 for each day in which the discharger was required to monitor for that pollutant.	Statutory language, CWA §309.
Failure to submit adequate discharge monitoring report on time (each failure to monitor for a particular pollutant is subject to a separate penalty calculation).	\$25,000.	Statutory language, CWA §309.
Failure to timely submit a report or other document (each failure to timely complete an activity covered by the report is subject to a separate penalty calculation).	\$25,000	Settlement policy discretion.

NOTES:

* For administrative penalty cases the penalty per day for each violation is \$10,000 and may not exceed the total penalty amount allowed in a Class I or Class II administrative proceeding.

** For purposes of calculating penalties, the act of monitoring for a particular pollutant includes the sequence of events starting with the collection of the wastewater sample through completion of the analytical testing of the sample. The obligation to report the results of the monitoring is a separate act subject to a separate penalty calculation.

The guidelines set forth here reflect EPA's policy on how to calculate the statutory maximum penalty with regards to ensuring that all settlement penalties sought pursuant to the Penalty Policy do not exceed such statutory maximum. At trial or in a hearing, EPA reserves the right to calculate the statutory maximum pursuant to more aggressive assumptions.

ATTACHMENT 2 TO INTERIM CWA SETTLEMENT PENALTY POLICY

Case Name _____ Date _____

Prepared by _____ and _____ [attorney name].

SETTLEMENT PENALTY CALCULATION WORKSHEET

STEP	AMOUNT
1. Calculate Statutory Maximum Penalty (period of violations from ____ through ____)	
2. Economic Benefit (attach BEN printouts, with explanations for calculations)	
3. Total of Monthly Gravity Amounts	
4. Economic Benefit + Gravity (lines 2 + 3)	
5. Gravity Adjustments	
a. Flow Reduction Factor ____ (0 to 50%) X line 3	
b. Recalcitrance Factor ____ (0 to 150%) X line 3	
c. Quick Settlement Reduction ____ (0 or 10%) X line 3	
d. Total gravity adjustments (negative amount if net gravity reduction) (lines 5.b. - 5.c - 5.a)	
6. Preliminary Penalty Amount (lines 4 + 5.d)	
7. Litigation Consideration Reduction (if any)	
8. Ability to pay reduction (if any)	
9. Reduction for Supplemental Environmental Projects (if any)	
10. Bottom-line Cash Settlement Penalty (Line 6 less lines 7, 8 and 9. Or, if applicable, amount calculated by national municipal litigation consideration in §IV.D.6, less no more than 40% of that amount for appropriate SEPs.)	

Case Name: Altec Petroleum Group Inc.

Prepared by Matt Rudolph and Lorraine Dixon [attorney name].

SETTLEMENT PENALTY CALCULATION WORKSHEET

STEP	AMOUNT
Calculate Statutory Maximum Penalty.	\$22,000
1. Nature of the violation	\$0
2. Circumstances	\$0
3. Economic Benefit calculations ¹	\$0
4. Gravity Amounts ² a. Significance of violation (Monthly Range 0 to 20) b. Health and environmental harm (Monthly Range 0 to 50) c. Number of effluent limit violations (Monthly Range 0 to 5) d. Number of non-effluent limit violations (Monthly Range 0 to 70)	\$16,000
5. Ability to pay	\$0
6. Prior history of such violations	\$0
7. Degree of culpability	\$2,720
8. Other matters as justice may require	\$0
TOTAL	\$18,720

¹ See attached BEN calculation

² See Interim Clean Water Act Settlement Penalty Policy for gravity calculation and tables referenced to determine the Monthly Range amounts for each component.

August 2007						
Mo	Tu	We	Th	Fr	Sa	Su
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

September 2007						
Mo	Tu	We	Th	Fr	Sa	Su
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

October 2007						
Mo	Tu	We	Th	Fr	Sa	Su
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September 2007

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Time Line For the Altec Case

- *September 2007 – Rudolph was left a note from Ron Van Wyk with John Rempe's phone number.
- 9/13/07 – Rudolph contacted John Rempe.
- 9/17/08 – Rudolph was forwarded an e-mail from Renea Ryland which was originally sent to her from the Oklahoma Attorney General.
- 9/19/07 - Rudolph was forwarded an e-mail from Renea Ryland which was originally sent to her from the Oklahoma Attorney General. Attached was a letter to Altec to cease and desist operations.
- 9/20/07 - Rudolph was forwarded an e-mail from Renea Ryland which was originally sent to her from the Oklahoma Attorney General. Attached was a letter to Altec.
- 9/21/07 – EPA conducts an inspection at the location.
- 10/2/07 – Kent Sanborn e-mailed Rudolph the inspection report.
- 10/3/07 – Rudolph contacted Altec Petroleum and informed Mr. Adams of the inspection findings and resulting enforcement action.
- 11/16/07 – AO Docket No. CWA-06-2008-1737 was issued for the violations.
- 3/10/08 – EPA inspects the facility location. Found evidence of another discharge.
- 3/12/08 – Rudolph contacted Mr. Adams to let him know of the EPA's inspection findings from 3/10/08 and the issuance of a penalty for the violations.
- 3/26/08 – Rudolph received inspection report from Sanborn via e-mail.
- *April 2008 – Sanborn forwarded to Rudolph, John Rempe's Altec photos.
- 05/20/08 – EPA issued APO Docket No. CWA-06-2008-1832.
- * June 2008 – Altec responded to the Complaint sending a letter to the EPA and addressing it to John Blevins.
- 7/2/08 – Mr. Adams spoke with Rudolph about settlement. No settlement was reached and Adams felt Rudolph was unfair and not considerate.
- 7/17/08 – Rudolph and Lorraine Dixon contacted Adams and tried to reach a settlement.
- 7/31/08 – Altec submitted receipts to EPA for clean-up.
- 9/9/08 – Rudolph contacted John Rempe in-regards to appearing as a witness for this case.
- 9/11/08 – Rudolph contact Rempe in-regards to the impacted water body, and realized the wrong water body was identified in the Complaint and it should have been a tributary of the South Fork of Pond Creek. Rempe informed Rudolph the creek flows approx. 6-8 months out of the year.
- 9/18/08 – Kent Sanborn re-inspected the site and the impacted water body.
- 9/24/08 – EPA amended the Complaint to include the correct water body.

*not sure on the exact date.

INSPECTION REPORT

REPORT DATE: 10/2/2007

INCIDENT NO: 09212007-2

INSPECTION DATE: 9/21/2007

INVESTIGATOR: Kent Sanborn

LOCATION: NW /4, Sec. 36 , T 28N, R 9E

COUNTY: OSAGE

SPILL OR DISCHARGE DATE:

MATERIAL SPILLED: Brine

AMOUNT: UNKNOWN

REPORTED BY:

OWNER/OPERATOR: ALTEC TESTING AND ENGINEERING, INC.
6035 Fremont Street
Riverside, CA 92504-1114
951-367-9055

SURFACE OWNER: STATE OF OKLAHOMA

PHONE: Unknown

EMERGENCY HOTLINE NOTIFIED:

POINT SOURCE: DRILLING PITS

LATITUDE/LONGITUDE: 36 51.970N, 96 17.492W

RECEIVING WATER: ROCK CREEK TRIBUTARY

LATITUDE/LONGITUDE: 36 51.939N, 96 17.582W

INSPECTION OBSERVATIONS:

OPERATOR DRILLED WELL ON STATE LAND. 2 STORAGE PITS WERE CONSTRUCTED TO HOLD DRILLING FLUIDS. AT SOME POINT THE PITS BEGAN LEAKING OUT THE BOTTOM ALONG THE ROCK SHELF THEY WERE CONSTRUCTED ON. THEY WERE NOT LINED. BRINE ENTERED THE SMALL CREEK OVER A PERIOD OF WEEKS TO THE OBJECTION OF THE STATE. BIA THEN CLOSED THE PITS BY DRAINING AND BACKFILLING WITH DIRT. I THEN INSPECTED AND FOUND THE PITS RESTORED. THERE IS EVIDENCE OF BRINE IN THE CREEK. THERE IS ALSO A WET AREA NEXT TO THE CREEK THAT PROBABLY WAS THE DISCHARGE PATH. TSS IN THE CREEK WAS 30K PPM AND DROPPED TO ABOUT 2500 PPM ABOUT 200 YARDS SOUTH. I TOLD OPERATOR TO DIG A CONTAINMENT PIT TO CATCH ANY RUNOFF FROM THE SITE AND HAUL OFF WITH A TRUCK. AS OF TODAY THAT PIT WAS NOT DUG. RAIN IS EXPECTED TODAY.

HE WAS TOLD TO RESTORE THE SURFACE USING GYP AND COMPOST. I SUGGESTED HE TERRACE THE SITE TO PREVENT SOIL EROSION.

SUPPORTING VIDEO, PICTURES, OR SAMPLES: Photos

OTHER AGENCIES OR PARTIES CONTACTED OR INVOLVED:

BIA, OK DEPT OF WILDLIFE, AG (OK)

ADDITIONAL COMMENTS/INFORMATION OBTAINED:

Rudolph contacted Respondent on 10/3/07 and informed them of the inspection findings and the resulting enforcement actions.



United States
Environmental Protection
Agency

Office of Water
Regulations and Standards
Criteria and Standards Division
Washington, DC 20460

EPA 440/5-89-001
February 1988



Water

Ambient Water Quality Criteria for Chloride—1988



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AMBIENT AQUATIC LIFE WATER QUALITY CRITERIA FOR
CHLORIDE

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL RESEARCH LABORATORY
DULUTH, MINNESOTA

NOTICES

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NTIS accession No. PB88-175 047

FOREWORD

Section 304(a)(1) of the Clean Water Act of 1977 (P.L. 95-217) requires the Administrator of the Environmental Protection Agency to publish water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all identifiable effects on health and welfare that might be expected from the presence of pollutants in any body of water, including ground water. This document is a revision of proposed criteria based upon consideration of comments received from other Federal agencies, State agencies, special interest groups, and individual scientists. Criteria contained in this document replace any previously published EPA aquatic life criteria for the same pollutant(s).

The term "water quality criteria" is used in two sections of the Clean Water Act, section 304(a)(1) and section 303(c)(2). The term has a different program impact in each section. In section 304, the term represents a non-regulatory, scientific assessment of ecological effects. Criteria presented in this document are such scientific assessments. If water quality criteria associated with specific stream uses are adopted by a State as water quality standards under section 303, they become enforceable maximum acceptable pollutant concentrations in ambient waters within that State. Water quality criteria adopted in State water quality standards could have the same numerical values as criteria developed under section 304. However, in many situations States might want to adjust water quality criteria developed under section 304 to reflect local environmental conditions and human exposure patterns before incorporation into water quality standards. It is not until their adoption as part of State water quality standards that criteria become regulatory.

Guidance to assist States in the modification of criteria presented in this document, in the development of water quality standards, and in other water-related programs of this Agency has been developed by EPA.

William A. Whittington
Director
Office of Water Regulations and Standards

ACKNOWLEDGMENTS

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Introduction

The major anthropogenic sources of chloride in surface waters are deicing salt, urban and agricultural runoff, and discharges from municipal wastewater plants, industrial plants, and the drilling of oil and gas wells (Birge et al. 1985; Dickman and Gochbauer 1978; Sonzogni et al. 1983). Beeton (1965) reported that concentrations of chloride had been rising in Lake Erie, Lake Ontario, and Lake Michigan since the early 1900s, and in Lake Huron since the 1950s, but Sonzogni et al. (1983) stated that the rate of change of chloride inputs to the Great Lakes had stabilized or decreased.

Chloride has long received special attention from researchers interested in fish. In 1937, Ellis discussed the concept that "fresh-water fish tolerate an osmotic pressure of the external medium equal to that of their own blood if the various salts and substances in the water are balanced against each other so as to exclude the specific toxic effects" and presented supporting data. Chloride has been used as a nutrient and prophylactic for fish (Hinton and Eversole 1979; Phillips 1944). It has also been suggested for use as a reference toxicant (Adelman and Smith 1976a,b; Threader and Houston 1983).

Because anthropogenic sources of chloride are unlikely to pose a threat to saltwater species, this document concerns effects on only freshwater species. Unless otherwise noted, all concentrations of chloride in water reported herein from toxicity and bioconcentration tests are expected to be essentially equivalent to dissolved chloride concentrations. All concentrations are expressed as chloride, not as the chemical tested. An understanding of the "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" (Stephan et al. 1985), hereinafter referred to as the Guidelines, and the response to public comment (U.S. EPA 1985a) is necessary in order to understand the

following text, tables, and calculations. Results of such intermediate calculations as recalculated LC50s and Species Mean Acute Values are given to four significant figures to prevent roundoff errors in subsequent calculations, not to reflect the precision of the value. The latest comprehensive literature search for information for this document was conducted in August 1985; some more recent information was included.

Acute Toxicity to Aquatic Animals

Data that may be used, according to the Guidelines, in the derivation of a freshwater Final Acute Value for chloride are presented in Table 1. When compared on the basis of mg of chloride/L, the chlorides of potassium, calcium, and magnesium are generally more acutely toxic to aquatic animals than sodium chloride (Biesinger and Christensen 1972; Dowden 1961; Dowden and Bennett 1965; Hamilton et al. 1975; Patrick et al. 1968; Trama 1954). Only for sodium chloride, however, are enough data available to allow derivation of a water quality criterion. In addition, it seems likely that most anthropogenic chloride in ambient water is associated with sodium, rather than potassium, calcium, or magnesium (Dickman and Gochnauer 1978; Sonzogni et al. 1983).

Results listed in Table 1 from Dowden and Bennett (1965), Hamilton et al. (1975), and Kostecki and Jones (1983) were obtained from 24- and 48-hr tests, rather than the 96-hr tests specified in the Guidelines. Use of such results is considered acceptable for chloride because the acute values changed little from 24 to 48 or 96 hours, depending on the species, in acute toxicity tests on chloride. For example, ratios of 24-hr and 48-hr LC50s for sodium chloride with a midge and a daphnid were 0.91 and 0.81, respectively (Dowden and Bennett 1965; Thornton and Sauer 1972). Reed and Evans (1981) obtained a

ratio of 1.0 for 24-hr and 14-day LC50s determined with the channel catfish, bluegill, and largemouth bass (Table 5). Adelman and Smith (1976a,b) and Adelman et al. (1976) obtained ratios of 24- and 96-hr LC50s of 0.74 and 0.97 with goldfish and fathead minnows, respectively, in tests in which the fish were fed (Table 5).

Adult fingernail clams were more sensitive than juveniles (Anderson 1977), but for the American eel (Hinton and Eversole 1978) and the bluegill (Cairns and Scheier 1959) smaller organisms were slightly more sensitive than larger ones. No pronounced relationships have been observed between the acute toxicity of chloride to freshwater animals and hardness, alkalinity, or pH.

Species Mean Acute Values (Table 1) were calculated as geometric means of the acute values from tests on sodium chloride, and then Genus Mean Acute Values (Table 3) were calculated as geometric means of the Species Mean Acute Values. Of the twelve genera for which acute values are available, the most sensitive genus, Daphnia, was only 6 times more sensitive than the most resistant, Anguilla. Invertebrates were generally more sensitive than vertebrates. The Final Acute Value for chloride was calculated to be 1,720 mg/L using the procedure described in the Guidelines and the Genus Mean Acute Values in Table 3. The acute value for Daphnia pulex is lower than the Final Acute Value.

Chronic Toxicity to Aquatic Animals

The available data that are usable according to the Guidelines concerning the chronic toxicity of chloride are presented in Table 2. In the life-cycle test with Daphnia pulex, survival was as good as in the control treatment at chloride concentrations up to 625 mg/L (Birge et al. 1985). At 314 mg/L, reproduction was as good as in the control, but at 441 and 625 mg/L,

reproduction was reduced by 27 and 39%, respectively. Thus, the chronic limits are 314 and 441 mg/L, the chronic value is 372.1 mg/L, and the acute-chronic ratio is 3.951.

In an early life-stage test with rainbow trout, a chloride concentration of 2,740 mg/L killed all the exposed organisms (Spehar 1987). Survival was 54% at 1,324 mg/L, but was 97% or higher at 643 mg/L and at two lower concentrations and in the control treatment. The mean weights of the fish alive at the end of the test at 1,324 mg/L and the lower tested concentrations were within 5% of the mean weight of the fish in the control treatment. The chronic value and the acute-chronic ratio obtained with the rainbow trout were 922.7 mg/L and 7.308, respectively.

In an early life-stage test with the fathead minnow, Pimephales promelas, Birge et al. (1985) found that weight was as good as in the control treatment up to a chloride concentration of 533 mg/L. Survival was reduced 9% by a concentration of 352 mg/L and was reduced 15% by 533 mg/L. The chronic value is 433.1 mg/L, and the acute-chronic ratio is 15.17.

The three acute-chronic ratios available for chloride are 7.308, 15.17, and 3.951 (Table 3). The geometric mean of these three is 7.594, which is used as the Final Acute-Chronic Ratio. Division of the Final Acute Value by the Final Acute-Chronic Ratio results in a Final Chronic Value of 226.5 mg/L, which is substantially lower than all three chronic values in Table 2.

Toxicity to Aquatic Plants

Data on the toxicity of chloride to aquatic plants show a wide range of sensitivities (Table 4). The alga, Spirogyra setiformis, was extremely sensitive to the effects of chloride; inhibition of growth, chlorophyll, and fixation of ^{14}C occurred at 71 mg/L (Shitole and Joshi 1984). Growth of

Netrium digitus was affected at 200 mg/L, but the other sixteen tested species were affected by concentrations ranging from 642 to 36,400 mg/L. A Final Plant Value, as defined in the Guidelines, cannot be obtained because no test in which the concentrations of chloride were measured and the endpoint was biologically important has been conducted with an important aquatic plant species.

Eyster (1962) reported that a concentration of 0.18 mg/L stimulated the growth of many algae, and Sonzogni et al. (1983) discussed the possibility that concentrations above 10 mg/L might shift phytoplankton communities toward nuisance, taste-and-odor-causing blue-green algae. When chloride was added to a small stream at a concentration of 610 mg/L, the algal density decreased whereas the bacterial density increased.

Although most of the data on toxicity of chloride to freshwater plants has been obtained with sodium chloride, some evidence indicates that a similar cation-anion toxicity relationship exists for both aquatic plants and animals. Patrick et al. (1968) demonstrated that potassium chloride was 2.3 times more toxic to a diatom than sodium chloride (Table 4), although calcium chloride was 1.3 times less toxic than sodium chloride. Tuchman and Stoermer (Manuscript a,b) found that potassium chloride had a greater inhibitory effect on algal population dynamics and nutrient uptake than sodium chloride.

Bioaccumulation

No data that are usable according to the Guidelines are available concerning the accumulation of chloride by freshwater species.

Other Data

Additional data on the lethal and sublethal effects of chloride on freshwater species are presented in Table 5. Anderson (1944,1948) and

Biesinger and Christensen (1972) found the same cation-anion toxicity relationship that is apparent in Table 1. Sreenivasan et al. (1979) reported that the rotifer, Brachionus rubens, tolerates chloride up to at least 1,400 mg/L. Wallen et al. (1957) reported that magnesium chloride was less toxic to the mosquitofish than sodium chloride; however, these tests were conducted in very turbid water and therefore the results might be atypical. A concentration of 13% sodium chloride in the diet of trout caused no ill effects, whereas 25 mg in gelatin capsules caused edema and death of brook trout (Phillips 1944). Food consisting of 12% sodium chloride did not affect growth of Atlantic salmon (Shaw et al. 1975). Hasan and Macintosh (1986) and Tomasso et al. (1980) reported that chloride reduced the acute toxicity of nitrite to fish.

Unused Data

Some data concerning the effects of chloride on aquatic organisms and their uses were not used because the tests were conducted with species that are not resident in North America (e.g., Coetzee and Hattingh 1977; Das and Srivastava 1978; Ferri and Sesso 1982; Katz and Ben-Sasson 1984; Meech and Thomas 1980; Schiewer 1974, 1984; Stangenberg 1975; Vaidya and Nagabhushanam 1979). Jennings (1976) compiled data from other sources. Data were not used when chloride was a component of an effluent (Birge et al. 1985). Reports by Batterton et al. (1972), Hosiaisluma (1976), and Palmer and Maloney (1955) provided no usable data on the toxicity of chloride. Arnold (1974), Davis et al. (1972), and Edmister and Gray (1948) did not adequately describe their test procedures or results or both.

Results of some laboratory tests were not used because the tests were conducted in distilled or deionized water without addition of appropriate

salts (e.g., Kardatzke 1980,1981; Lee 1973; Mahajan et al. 1979; Pappas and Pappas 1983; Stamper 1969; Thornton and Wilhm 1974,1975; Zaim and Newson 1979) or were conducted in chlorinated or "tap" water (e.g., Kumar and Srivastava 1981). Christensen (1971/72) and Christensen and Tucker (1976) exposed plasma or enzymes. Length of exposure was not reported by Batterton and Van Baalen (1971). High control mortalities occurred in tests reported by Lewis (1971). Tests conducted without controls (e.g., Vosjan and Siezen 1968) or with too few test organisms (e.g., Leblanc and Surprenant 1984) were also not used. Hughes (1968,1973) did not adequately acclimate the test organisms. Ten-day LC50s (Threader and Houston 1983) were not used because the fish had not been fed during the tests.

Many studies were not used because they addressed the metabolism, regulation, or transport, rather than toxicity, of chloride (e.g., Carrasquer et al. 1983; Castille and Lawrence 1981; De Renzis and Maetz 1973; Greenway and Setter 1979a,b; Hinkle et al. 1971; Konovalov 1984; McCormick and Naiman 1984; Ooshima and Oguri 1974; Perry et al. 1984; Shomer-Ilan and Waisel 1976; Sullivan et al. 1981; Ticku and Olsen 1977). Some references were not used because they were foreign-language reports for which no translation was available and no useful data could be obtained from the English abstracts (e.g., Frahm 1975; Mushak 1968; Schiewer 1976; Turoboyski 1960).

Summary

Although few data are available concerning the toxicity of any chloride salt other than sodium chloride, the data that are available indicate that, when compared on the basis of mg of chloride/L, the chlorides of potassium, calcium, and magnesium are generally more toxic to freshwater species than sodium chloride. Based on tests on sodium chloride, the acute sensitivities

of freshwater animals to chloride ranged from 1,470 mg/L for Daphnia pulex to 11,940 mg/L for the American eel. Invertebrate species were generally more sensitive than vertebrates. Results from tests with a variety of species show that if freshwater animals do not die within the first 24 hr of the test, they probably will not die during periods ranging from 48 hr to 11 days. No relationships have been observed between the acute toxicity of chloride to freshwater animals and hardness, alkalinity, pH, or life-stage of the test organisms.

A life-cycle test with Daphnia pulex and early life-stage tests with the rainbow trout and fathead minnow produced chronic values of 372.1, 922.7, and 433.1 mg/L, respectively. The acute-chronic ratios were calculated to be 3.951 for Daphnia pulex, 7.308 for rainbow trout, and 15.17 for the fathead minnow. Freshwater plants were affected at concentrations of chloride ranging from 71 to 36,400 mg/L. No data are available concerning bioaccumulation of chloride by freshwater organisms.

National Criteria

The procedures described in the "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" indicate that, except possibly where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if the four-day average concentration of dissolved chloride, when associated with sodium, does not exceed 230 mg/L more than once every three years on the average and if the one-hour average concentration does not exceed 860 mg/L more than once every three years on the average. This criterion probably will not be adequately protective when the chloride is associated with potassium, calcium, or magnesium, rather than sodium. In

addition, because freshwater animals have a narrow range of acute susceptibilities to chloride, excursions above this criterion might affect a substantial number of species.

Implementation

As discussed in the Water Quality Standards Regulation (U.S. EPA 1983a) and the Foreword to this document, a water quality criterion for aquatic life has regulatory impact only after it has been adopted in a State water quality standard. Such a standard specifies a criterion for a pollutant that is consistent with a particular designated use. With the concurrence of the U.S. EPA, States designate one or more uses for each body of water or segment thereof and adopt criteria that are consistent with the use(s) (U.S. EPA 1983b, 1987). In each standard a State may adopt the national criterion, if one exists, or, if adequately justified, a site-specific criterion.

Site-specific criteria may include not only site-specific criterion concentrations (U.S. EPA 1983b), but also site-specific, and possibly pollutant-specific, durations of averaging periods and frequencies of allowed excursions (U.S. EPA 1985b). The averaging periods of "one hour" and "four days" were selected by the U.S. EPA on the basis of data concerning how rapidly some aquatic species react to increases in the concentrations of some pollutants, and "three years" is the Agency's best scientific judgment of the average amount of time aquatic ecosystems should be provided between excursions (Stephan et al. 1985; U.S. EPA 1985b). However, various species and ecosystems react and recover at greatly differing rates. Therefore, if adequate justification is provided, site-specific and/or pollutant-specific concentrations, durations, and frequencies may be higher or lower than those given in national water quality criteria for aquatic life.

Use of criteria, which have been adopted in State water quality standards, for developing water quality-based permit limits and for designing waste treatment facilities requires selection of an appropriate wasteload allocation model. Although dynamic models are preferred for the application of these criteria (U.S. EPA 1985b), limited data or other considerations might require the use of a steady-state model (U.S. EPA 1986). Guidance on mixing zones and the design of monitoring programs is also available (U.S. EPA 1985b, 1987).

Table 1. Acute Toxicity of Chloride to Aquatic Animals

<u>Species</u>	<u>Method^a</u>	<u>Chemical</u>	<u>Hardness</u> (mg/L as CaCO ₃)	<u>LC50</u> or <u>EC50</u> (mg/L) ^b	<u>Species Mean</u> <u>Acute Value</u> (mg/L) ^c	<u>Reference</u>
<u>FRESHWATER SPECIES</u>						
Snail, <u>Physa gyrina</u>	F, M	Sodium chloride	100	2,540	2,540	Birge et al. 1985
Snail, <u>Physa heterostropha</u>	S, U	Potassium chloride	-	451	-	Academy of Natural Sciences 1960; Patrick et al 1968
Fingernail clam (adult >5 cm), <u>Musculium transversum</u>	S, M	Potassium chloride	263	168	-	Anderson 1977
Fingernail clam (adult >5 cm), <u>Musculium transversum</u>	S, M	Potassium chloride	243	254	-	Anderson 1977
Fingernail clam (juvenile <5 cm), <u>Musculium transversum</u>	S, M	Potassium chloride	263	472	-	Anderson 1977
Fingernail clam (juvenile <5 cm), <u>Musculium transversum</u>	S, M	Potassium chloride	243	907	-	Anderson 1977
Fingernail clam (juvenile <5 cm), <u>Musculium transversum</u>	S, M	Potassium chloride	234	1,655 ^d	-	Anderson 1977
Cladoceran (1st instar), <u>Daphnia magna</u>	S, U	Sodium chloride	-	<2,562 ^e	-	Anderson 1946

Table 1 (continued)

<u>Species</u>	<u>Method^a</u>	<u>Chemical</u>	<u>Hardness (mg/L as CaCO₃)</u>	<u>LC50 or EC50 (mg/L)^b</u>	<u>Species Mean Acute Value (mg/L)^c</u>	<u>Reference</u>
<u>Cladoceran, Daphnia magna</u>	S, U	Potassium chloride	-	171	-	Dowden 1961
<u>Cladoceran, Daphnia magna</u>	S, U	Calcium chloride	-	486	-	Dowden 1961
<u>Cladoceran, Daphnia magna</u>	S, U	Sodium chloride	-	2,024	-	Dowden 1961
<u>Cladoceran, Daphnia magna</u>	S, U	Calcium chloride	-	1,923	-	Dowden and Bennett 1965
<u>Cladoceran, Daphnia magna</u>	S, U	Magnesium chloride	-	2,774	-	Dowden and Bennett 1965
<u>Cladoceran, Daphnia magna</u>	S, U	Sodium chloride	-	3,583	-	Dowden and Bennett 1965
<u>Cladoceran, Daphnia magna</u>	S, U	Potassium chloride	45	86	-	Biesinger and Christensen 1972
<u>Cladoceran, Daphnia magna</u>	S, U	Calcium chloride	45	92	-	Biesinger and Christensen 1972
<u>Cladoceran, Daphnia magna</u>	S, U	Magnesium chloride	45	409	-	Biesinger and Christensen 1972
<u>Cladoceran, Daphnia magna</u>	S, U	Sodium chloride	45	2,565	2,650	Biesinger and Christensen 1972

Table 1. (continued)

Species	Method ^a	Chemical	Hardness (mg/L as CaCO ₃)	LC50 or EC50 (mg/L) ^b	Species Mean Acute Value (mg/L) ^c	Reference
Cladoceran, <u>Daphnia pulex</u>	R, M	Sodium chloride	93	1,470	1,470	Birge et al. 1985
Isopod, <u>Liriceus fontinalis</u>	F, M	Sodium chloride	100	2,950	2,950	Birge et al. 1985
Caddisfly, <u>Hydroptila angusta</u>	S, U	Sodium chloride	124	4,039 ^f	4,039	Hamilton et al. 1975
Mosquito (larva), <u>Culex</u> sp.	S, U	Sodium chloride	-	6,222 ^f	6,222	Dowden and Bennett 1965
Midge, <u>Chironomus attenuatus</u>	S, U	Sodium chloride	-	4,900	4,900	Thornton and Sauer 1972
Midge, <u>Cricotopus trifascia</u>	S, U	Potassium chloride	124	1,434	-	Hamilton et al. 1975
Midge, <u>Cricotopus trifascia</u>	S, U	Sodium chloride	124	3,795	3,795	Hamilton et al. 1975
American eel (55 mm), <u>Anquilla rostrata</u>	S, U	Sodium chloride	44	10,900	-	Hinton and Eversole 1978
American eel (97.2 mm), <u>Anquilla rostrata</u>	S, U	Sodium chloride	44	13,085	11,940	Hinton and Eversole 1979
Rainbow trout, <u>Salmo gairdneri</u>	R, U	Sodium chloride	-	3,336 ^g	-	Kostecki and Jones 1983
Rainbow trout, <u>Salmo gairdneri</u>	F, M	Sodium chloride	46	6,743	6,743	Spehar 1987

Table 1. (continued)

Species	Method ^a	Chemical	Hardness (mg/L as CaCO ₃)	LC50 or EC50 (mg/L) ^b	Species Mean Acute Value (mg/L) ^c	Reference
Goldfish, <u>Carassius auratus</u>	S, U	Sodium chloride	-	8,388 ^g	-	Dowden and Bennett 1965
Goldfish, <u>Carassius auratus</u>	S, M	Sodium chloride	149	9,455 ^h	8,906	Threader and Houston 1983
Fathead minnow, <u>Pimephales promelas</u>	F, M	Sodium chloride	100	6,570	6,570	Birge et al 1985
Bluegill, <u>Lepomis macrochirus</u>	S, U	Potassium chloride	39	956	-	Trama 1954
Bluegill, <u>Lepomis macrochirus</u>	S, U	Calcium chloride	39	6,804	-	Trama 1954
Bluegill, <u>Lepomis macrochirus</u>	S, U	Sodium chloride	39	7,846	-	Trama 1954
Bluegill (3.9 cm), <u>Lepomis macrochirus</u>	S, U	Calcium chloride	-	6,080	-	Cairns and Scheier 1959
Bluegill (6.1 cm), <u>Lepomis macrochirus</u>	S, U	Calcium chloride	-	6,080	-	Cairns and Scheier 1959
Bluegill (14.2 cm), <u>Lepomis macrochirus</u>	S, U	Calcium chloride	-	7,232	-	Cairns and Scheier 1959
Bluegill, <u>Lepomis macrochirus</u>	S, U	Potassium chloride	-	965	-	Academy of Natural Sciences 1960; Patrick et al. 1968

Table 1. (continued)

Species	Method ^d	Chemical	Hardness (mg/L as CaCO ₃)	LC50 or EC50 (mg/L) ^b	Species Mean Acute Value (mg/L) ^c	Reference
Bluegill, <u>Lepomis macrochirus</u>	S, U	Calcium chloride	-	6,816	-	Academy of Natural Sciences 1960; Patrick et al. 1968
Bluegill, <u>Lepomis macrochirus</u>	S, U	Sodium chloride	-	7,897	-	Academy of Natural Sciences 1960; Patrick et al. 1968
Bluegill, <u>Lepomis macrochirus</u>	S, U	Potassium chloride	-	2,640 ^g	-	Dowden and Bennett 1965
Bluegill, <u>Lepomis macrochirus</u>	S, U	Calcium chloride	-	5,344 ^g	-	Dowden and Bennett 1965
Bluegill, <u>Lepomis macrochirus</u>	S, U	Sodium chloride	-	8,616 ^g	-	Dowden and Bennett 1965
Bluegill, <u>Lepomis macrochirus</u>	F, M	Sodium chloride	100	5,870	5,870	Birge et al. 1985

^a S = static; R = renewal; F = flow-through; U = unmeasured; M = measured.

^b Concentration of chloride not the chemical

^c Only data obtained with sodium chloride were used in calculation of Species Mean Acute Values. Data for other salts are presented for comparison purposes only.

^d Test temperature = 7°C; the other tests with this species were at 17°C.

^e Not used in calculations because quantitative values are available for this species.

^f This value is from a 48-hr test (see text)

^g This value is from a 24-hr test (see text)

^h This value was derived from the published graph

Table 2. Chronic Toxicity of Chloride to Aquatic Animals

Species	Test ^a	Chemical	Hardness (mg/L as CaCO ₃)	Limits (mg/L) ^b	Chronic Value (mg/L)	Reference
<u>FRESHWATER SPECIES</u>						
Cladoceran, <u>Daphnia pulex</u>	LC	Sodium chloride	100	314-441	372.1	Birge et al. 1985
Rainbow trout, <u>Salmo gairdneri</u>	ELS	Sodium chloride	46	643-1,324	922.7	Spehar 1987
Fathead minnow, <u>Pimephales promelas</u>	ELS	Sodium chloride	100	352-533	433.1	Birge et al. 1985

^a LC = life-cycle or partial life-cycle; ELS = early life-stage.

^b Measured concentrations of chloride.

Species	Acute-Chronic Ratio		
	Hardness (mg/L as CaCO ₃)	Acute Value (mg/L)	Chronic Value (mg/L)
Cladoceran, <u>Daphnia pulex</u>	100	1,470	372.1
Rainbow trout, <u>Salmo gairdneri</u>	46	6,743	922.7
Fathead minnow, <u>Pimephales promelas</u>	100	6,570	433.1
			Ratio
			3.951
			7.308
			15.17

Table 3. Ranked Genus Mean Acute Values with Species Mean Acute-Chronic Ratios

Rank ^a	Genus Mean Acute Value (mg/L)	Species	Species Mean Acute Value (mg/L) ^b	Species Mean Acute-Chronic Ratio ^c
<u>FRESHWATER SPECIES</u>				
12	11,940	American eel, <u>Anquilla rostrata</u>	11,940	-
11	8,906	Goldfish, <u>Carassius auratus</u>	8,906	-
10	6,743	Rainbow trout, <u>Salmo gairdneri</u>	6,743	7.308
9	6,570	Fathead minnow, <u>Pimephales promelas</u>	6,570	15.17
8	6,222	Mosquito, <u>Culex sp.</u>	6,222	-
7	5,870	Bluegill, <u>Lepomis macrochirus</u>	5,870	-
6	4,900	Widge, <u>Chironomus attenuatus</u>	4,900	-
5	4,039	Caddisfly, <u>Hydroptila angusta</u>	4,039	-
4	3,795	Widge, <u>Cricotopus trifascia</u>	3,795	-
3	2,950	Isopod, <u>Lireus fontinalis</u>	2,950	-
2	2,540	Snail, <u>Physa gyrina</u>	2,540	-

Table 3. (continued)

Rank ^a	Genus Mean Acute Value (mg/L)	Species	Species Mean Acute Value (mg/L) ^b	Species Mean Acute-Chronic Ratio ^c
1	1,974	Cladoceran, <i>Daphnia magna</i>	2,650	-
		Cladoceran, <i>Daphnia pulex</i>	1,470	3.951

^a Ranked from most resistant to most sensitive based on Genus Mean Acute Value.

^b From Table 1.

^c From Table 2.

Final Acute Value = 1,720 mg/L

Criterion Maximum Concentration = (1,720 mg/L) / 2 = 860.0 mg/L

Final Acute-Chronic Ratio = 7.594 (see text)

Final Chronic Value = (1,720 mg/L) / 7.594 = 226.5 mg/L

Table 4. Toxicity of Chloride to Aquatic Plants

<u>Species</u>	<u>Chemical</u>	<u>Duration</u> <u>(days)</u>	<u>Effect</u>	<u>Concentration</u> <u>(mg/L)^a</u>	<u>Reference</u>
<u>FRESHWATER SPECIES</u>					
Alga, <u>Anacystis nidulans</u>	Sodium chloride	4	Growth inhibition	>24,300	Schiener 1974
Alga, <u>Anabaena variabilis</u>	Sodium chloride	4	Growth inhibition	14,300	Schiener 1974
Alga, <u>Chlamydomonas reinhardtii</u>	Sodium chloride	3-6	Growth inhibition	3,014	Reynoso et al. 1982
Alga, <u>Chlorella emersonii</u>	Sodium chloride	8-14	Growth inhibition	7,000	Setter et al. 1982
Alga, <u>Chlorella fusca fusca</u>	Sodium chloride	28	Growth inhibition	18,200	Kessler 1974
Alga, <u>Chlorella fusca rubescens</u>	Sodium chloride	28	Growth inhibition	24,300	Kessler 1974
Alga, <u>Chlorella fusca vacuolata</u>	Sodium chloride	28	Growth inhibition	24,300	Kessler 1974
Alga, <u>Chlorella kessleri</u>	Sodium chloride	28	Growth inhibition	18,200	Kessler 1974
Alga, <u>Chlorella luteoviridis</u>	Sodium chloride	28	Growth inhibition	36,400	Kessler 1974

Table 4. (continued)

<u>Species</u>	<u>Chemical</u>	<u>Duration</u> <u>(days)</u>	<u>Effect</u>	<u>Concentration</u> <u>(mg/L)^a</u>	<u>Reference</u>
Alga, <u>Chlorella minutissima</u>	Sodium chloride	28	Growth inhibition	12,100	Kessler 1974
Alga, <u>Chlorella protothecoides</u>	Sodium chloride	28	Growth inhibition	30,300	Kessler 1974
Alga, <u>Chlorella saccharophylla</u>	Sodium chloride	28	Growth inhibition	30,300	Kessler 1974
Alga, <u>Chlorella vulgaris</u>	Potassium chloride	90-120	Growth inhibition	23,800	De Jong 1965
Alga, <u>Chlorella vulgaris</u>	Sodium chloride	90-120	Growth inhibition	24,100	De Jong 1965
Alga, <u>Chlorella vulgaris</u> <u>tertia</u>	Sodium chloride	28	Growth inhibition	18,200	Kessler 1974
Alga, <u>Chlorella vulgaris</u> <u>vulgaris</u>	Sodium chloride	28	Growth inhibition	24,300	Kessler 1974
Alga, <u>Chlorella zofingiensis</u>	Sodium chloride	28	Growth inhibition	12,100	Kessler 1974
Alga, <u>Pithophora oedogonia</u>	Sodium chloride	10	Inhibition of growth, chlorophyll, and ¹⁴ C fixation	886	Shitole and Joshi 1984
Alga, <u>Spirogyra setiformis</u>	Sodium chloride	10	Inhibition of growth, chlorophyll, and ¹⁴ C fixation	71	Shitole and Joshi 1984
Desmid, <u>Metrium digitus</u>	Sodium chloride	21	Growth inhibition	200	Hosiaistuoma 1976

Table 4. (continued)

<u>Species</u>	<u>Chemical</u>	<u>Duration (days)</u>	<u>Effect</u>	<u>Concentration (mg/L)^a</u>	<u>Reference</u>
Desmid, <u>Meirium digitus</u>	Sodium chloride	21	Growth inhibition	250	Hosiaisluoma 1976
Diatom, <u>Nitzschia linearis</u>	Potassium chloride	5	EC50	642	Academy of Natural Sciences 1960; Patrick et al. 1968
Diatom, <u>Nitzschia linearis</u>	Calcium chloride	5	EC50	2,003	Academy of Natural Sciences 1960; Patrick et al. 1968
Diatom, <u>Nitzschia linearis</u>	Sodium chloride	5	EC50	1,482	Academy of Natural Sciences 1960; Patrick et al. 1968
Eurasian watermilfoil, <u>Myriophyllum spicatum</u>	Sodium chloride	32	50% reduction in dry weight	3,617	Stanley 1974
Eurasian watermilfoil, <u>Myriophyllum spicatum</u>	Sodium chloride	32	50% reduction in dry weight	4,964	Stanley 1974
Angiosperm (seed), <u>Potamogeton pectinatus</u>	Sodium chloride	28	Reduced germination	1,820	Teeter 1965
Angiosperm (9-wk old plants), <u>Potamogeton pectinatus</u>	Sodium chloride	35	Reduced dry weight	1,820	Teeter 1965
Angiosperm (13-wk old plants), <u>Potamogeton pectinatus</u>	Sodium chloride	35	Reduced shoots and dry weight	1,820	Teeter 1965

^a Concentration of chloride, not the chemical

Table 5. Other Data on Effects of Chloride on Aquatic Organisms

Species	Chemical	Hardness (mg/L as CaCO ₃)	Duration	Effect	Concentration (mg/L) ^a	Reference
<u>FRESHWATER SPECIES</u>						
Alga, <u>Chlorella pyrenoidosa</u>	Sodium chloride	-	24 hr	Inhibited growth	301	Kalinkina 1979; Kalinkina and Stragonov 1980 Kalinkina et al. 1978
Protozoan, <u>Paramecium tetraurelia</u>	Sodium chloride	-	5 days	17% reduction in cell division	350 ^b	Crankite et al. 1985
Cladoceran (1st instar), <u>Daphnia magna</u>	Potassium chloride	-	16 hr	LC50	179	Anderson 1944
Cladoceran (1st instar), <u>Daphnia magna</u>	Calcium chloride	-	16 hr	LC50	853	Anderson 1944
Cladoceran (1st instar), <u>Daphnia magna</u>	Sodium chloride	-	16 hr	LC50	3,747	Anderson 1944
Cladoceran, <u>Daphnia magna</u>	Potassium chloride	-	64 hr	Incipient inhibition	207	Anderson 1948
Cladoceran, <u>Daphnia magna</u>	Calcium chloride	-	64 hr	Incipient inhibition	589	Anderson 1948
Cladoceran, <u>Daphnia magna</u>	Magnesium chloride	-	64 hr	Incipient inhibition	555	Anderson 1948
Cladoceran, <u>Daphnia magna</u>	Sodium chloride	-	64 hr	Incipient inhibition	2,245	Anderson 1948
Cladoceran, <u>Daphnia magna</u>	Potassium chloride	45	21 days	Reproductive impairment	44 ^c	Biesinger and Christensen 1972

Table 5. (continued)

<u>Species</u>	<u>Chemical</u>	Hardness (mg/L as <u>CaCO₃</u>)	<u>Duration</u>	<u>Effect</u>	<u>Concentration</u> (mg/L) ^a	<u>Reference</u>
Cladoceran, <u>Daphnia magna</u>	Calcium chloride	45	21 days	Reproductive impairment	206 ^c	Biesinger and Christensen 1972
Cladoceran, <u>Daphnia magna</u>	Magnesium chloride	45	21 days	Reproductive impairment	239 ^c	Biesinger and Christensen 1972
Cladoceran, <u>Daphnia magna</u>	Sodium chloride	45	21 days	Reproductive impairment	1,062 ^c	Biesinger and Christensen 1972
Caddisfly, <u>Hydroptila anaxsta</u>	Potassium chloride	124	48 hr	LC50	2,119	Hamilton et al. 1975
Goldfish, <u>Carassius auratus</u>	Sodium chloride	-	24 hr 96 hr -	LC50 (fed) LC50 (fed) Threshold LC50	6,037 4,453 4,442	Adelman and Smith 1976a, b Adelman et al. 1976
Shiners, <u>Notropis sp.</u>	Sodium chloride	-	5 days	Reduced survival	1,525	Van Horn et al. 1949
Fathead minnow (11 wk), <u>Pimephales promelas</u>	Sodium chloride	-	24 hr 96 hr -	LC50 (fed) LC50 (fed) Threshold LC50	4,798 4,640 4,640	Adelman and Smith 1976a b Adelman et al. 1976
Channel catfish, <u>Ictalurus punctatus</u>	Sodium chloride	412	24 hr 14 days	LC50 (fed)	8,000 8,000	Reed and Evans 1981
Mosquitofish, <u>Gambusia affinis</u>	Potassium chloride	-	24 hr 96 hr	LC50 ^d	4,800 442	Wallen et al. 1957
Mosquitofish, <u>Gambusia affinis</u>	Calcium chloride	-	24 hr 96 hr	LC50 ^d	8,576 8,576	Wallen et al. 1957
Mosquitofish, <u>Gambusia affinis</u>	Magnesium chloride	-	24 hr 96 hr	LC50 ^d	14,060 12,370	Wallen et al. 1957

Table 5. (continued)

<u>Species</u>	<u>Chemical</u>	<u>Hardness</u> (mg/L as CaCO ₃) ¹	<u>Duration</u>	<u>Effect</u>	<u>Concentration</u> (mg/L) ^a	<u>Reference</u>
Mosquitofish, <u>Gambusia affinis</u>	Sodium chloride	-	24 hr 96 hr	LC50 ^d	11,040 10,710	Wallen et al. 1957
Bluegill, <u>Lepomis macrochirus</u>	Sodium chloride	412	24 hr 14 days	LC50 (fed)	8,000 8,000	Reed and Evans 1981
Largemouth bass (juvenile), <u>Micropterus salmoides</u>	Sodium chloride	412	24 hr 14 days	LC50 (fed)	8,500 8,500	Reed and Evans 1981

^a Concentration of chloride, not the chemical.

^b This value was derived from the published graph.

^c Concentrations not measured in test solutions.

^d Turbidity = <25 to 320 mg/L.

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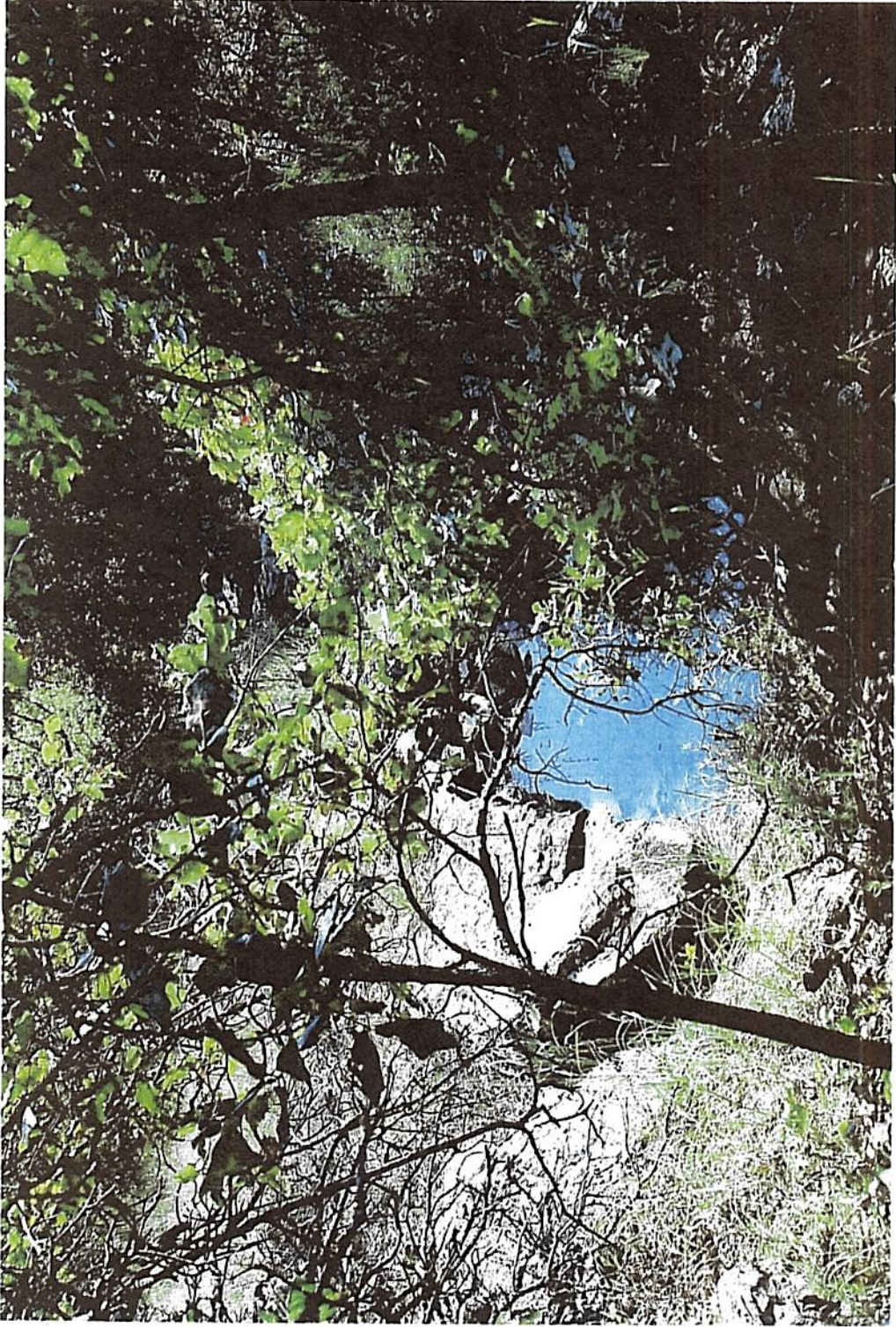


Photo 10 taken south. This is creek farther south. TSS here is 2500 ppm.

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Photo 1 taken southwest. Newly drilled well. No production casing set vet.

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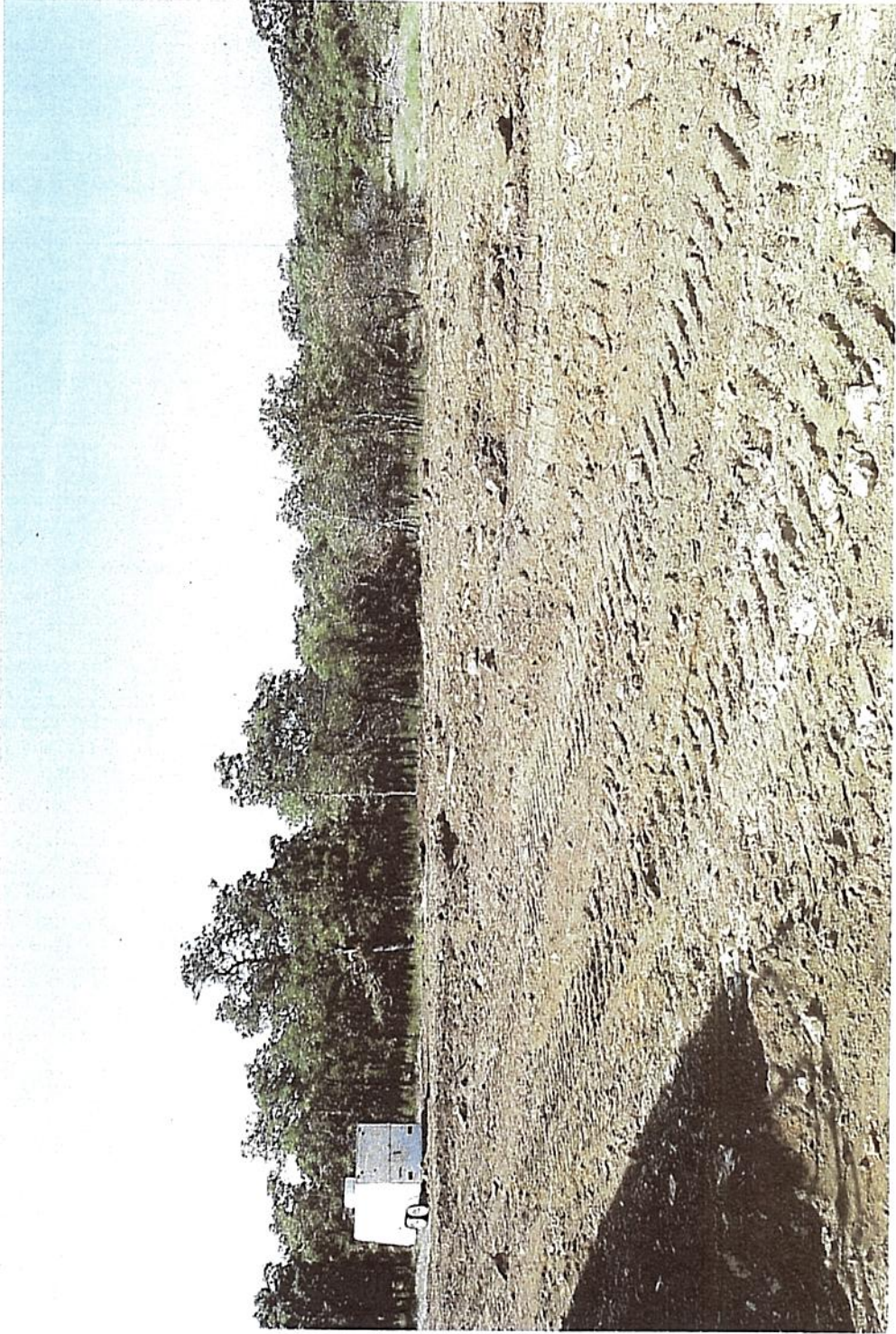


Photo 2 taken southwest. Old pit locations were present here before being filled with dirt.

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Photo 3 taken west. Location cleared for drilling. Some wet spots were pits were filled in.

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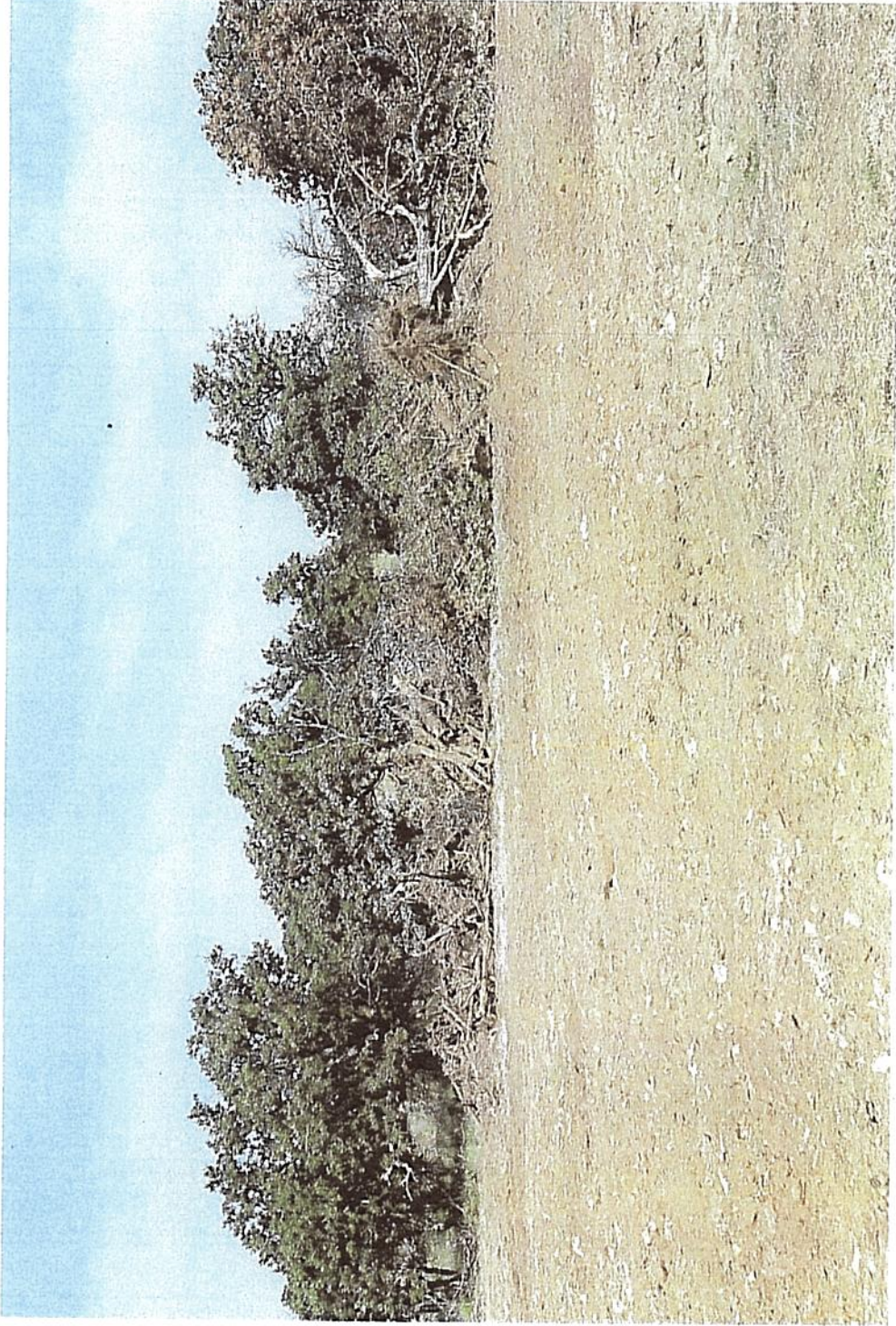


Photo 4 taken north. Trees were piled in one location on the north side of the drilling site.

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Photo 5 taken west. Close-up of soft and mushy area wet from pit soaked soils.

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Photo 6 taken west. Before pits were filled they reportedly seeped out their base here into the small creek. Note dead trees.

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Photo 7 taken east. Reverse angle photo from creek entry point showing wet ground from seeps and size of drilling location.

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Photo 8 taken south. This part of the creek was drained by a tank truck. TSS was 30k ppm. No oil seen.

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Photo 9 taken southwest. Another part of the creek sucked out by tank truck.