

ORIGINAL

IN THE SUPREME COURT OF OHIO

STATE OF OHIO EX REL.
WAYNE T. DONER, ET AL.

Relators,

v.

SEAN D. LOGAN, DIRECTOR
OHIO DEPARTMENT OF
NATURAL RESOURCES, ET AL.

Respondents.

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: Case No.: 2009-1292
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JOINT EXHIBITS – VOLUME SIXTEEN

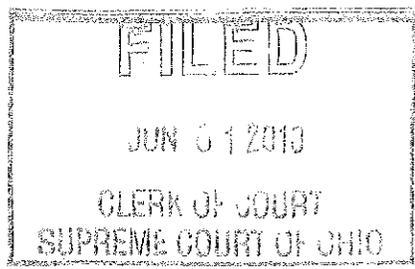
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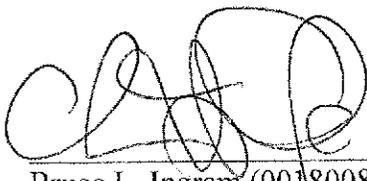
Attorneys for Respondents



The parties to this action, by and through their respective attorneys, hereby jointly submit, for purposes of this action only, that each of the exhibits listed below are authentic for all purposes in this action:

<u>Tab</u>	<u>Description</u>
79	Deposition Transcript with Exhibits of Tadd Henson taken April 29, 2010

Dated: June 1st, 2010 Joint Exhibits Approved and Respectfully Submitted By:



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Tab 79

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THE SUPREME COURT OF OHIO

STATE OF OHIO EX REL.)
WAYNE T. DONER, ET AL.,)
relators,)
vs.)
SEAN D. LOGAN,)
DIRECTOR, OHIO DEPARTMENT)
OF NATURAL RESOURCES, ET)
AL.,)
Respondents.)

Case No.
2009-1292

DEPOSITION OF
TADD HENSON, P.E.

Taken at the offices of
VORYS, SATER, SEYMOUR & PEASE, LLP
52 East Gay Street
Columbus, Ohio 43216-1008

on April 29, 2010, at 2:35 p.m.

Reported by: Sara S. Clark, RPR/CRR/CCP/CBC

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22 ALSO PRESENT:

23 Jay Dorsey

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STIPULATIONS

It is stipulated by and among counsel for the respective parties that the deposition of TADD HENSON, P.E., the Witness herein, called by the Relators under the applicable Rules of Civil Procedure may be taken at this time by the notary pursuant to notice and by agreement; that said deposition may be reduced to writing in stenotypy by the notary, whose notes thereafter may be transcribed out of the presence of the witness; and that the proof of the official character and qualification of the notary is waived.

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1 TADD HENSON, P.E.

2 being first duly sworn, as hereinafter
3 certified, deposes and says as follows:

4 EXAMINATION

5 BY MR. FUSONIE:

6 Q. Could you state your full name for the
7 record.

8 A. Yeah. Tadd Henson.

9 Q. Mr. Henson, my name is Tom Fusonie. I'm
10 an attorney at the Vorys law firm. We represent
11 the relators in the Doner versus Logan lawsuit.

12 Have you ever had your deposition taken
13 before?

14 A. No.

15 Q. Okay. I'll just quickly go over some of
16 the ground rules. We can't talk over each other
17 so that the court reporter can take down
18 everything that's being said. If you allow me
19 to ask my full question, I'll do my best to
20 allow you to answer fully before moving on to my
21 next question. If you don't understand my
22 question, ask me to repeat it or rephrase it.
23 If you answer my question, I'm going to assume
24 that you understood it. Is that fair?

1 A. Yes.

2 Q. Another thing, the court reporter can't
3 take down nodding of the head, shaking of the
4 head, uh-huh and huh-uh are very hard for the
5 court reporter to take down. So your answers
6 need to be verbal and like a yes-and-no format.

7 If you need a break at any time, let me
8 know. My only condition on that is if I have a
9 question pending, I would like you to answer
10 that question first.

11 A. Sure.

12 Q. How long have you worked at Stantec?

13 A. I believe it's been about six years.
14 Six and a half. A little over six.

15 Q. And what's your current position at
16 Stantec?

17 A. Senior associate.

18 Q. And what were you hired in as?

19 A. When I was -- I was hired, the company
20 was known as FMSM Engineers, Fuller, Mossbarger,
21 Scott & May Engineers. That was later acquired.
22 I was hired, I believe, as project engineer --
23 senior project engineer.

24 Q. What was your first position for the

1 stantec entity?

2 A. Senior project engineer.

3 Q.- What was your first position for Fuller?

4 A. Senior project -- senior project
5 engineer. It's the same entity.

6 Q. I understand. When you were hired in
7 originally, you hired in with Fuller?

8 A. Correct, who later was acquired by
9 Stantec.

10 Q. And so after they were acquired by
11 stantec, your position was still senior project
12 engineer?

13 A. I believe by that time, I was project
14 manager.

15 Q. Okay.

16 MR. FUSONIE: I'm going to continue on
17 with the exhibits because I may end up using
18 some of the same.

19 --0--

20 (Relators' Exhibit G marked.)

21 --0--

22 MR. FUSONIE: And I only have two copies
23 but this is his affidavit, without the --

24 MS. WORLY: We'll share. That's fine.

1 MR. FUSONIE: -- without the report
2 attached.

3 BY MR. FUSONIE:

4 Q. Mr. Henson, I've marked -- I'm showing
5 you what I have marked as Relators' Deposition
6 Exhibit G. Do you recognize this document as
7 your affidavit in this case, minus the CD-ROM
8 report that was attached?

9 A. Yes.

10 Q. If you could turn to Page 2. Is that
11 your signature?

12 A. Yes.

13 Q. And were you before a notary when you
14 signed this?

15 A. Yes.

16 Q. How long have you been a licensed
17 professional engineer in the state of Ohio?

18 A. Since -- I'm bad with dates -- 2001.

19 Q. Have you held your license continuously
20 since then?

21 A. Yes.

22 Q. Do you hold any other -- do you hold a
23 professional engineer license in any other
24 state?

1 A. No.

2 Q. Do you do work outside of Ohio at all?

3 A. Yes.

4 Q. And you have a master's degree in civil
5 engineering?

6 A. Yes.

7 Q. When did you obtain that?

8 A. 2001.

9 Q. Did you write a thesis for that?

10 A. No.

11 Q. And you do not have a Ph.D. in civil
12 engineering?

13 A. Correct.

14 Q. Have you attempted to obtain a Ph.D.?

15 A. No.

16 Q. Outside of the current project for this
17 lawsuit, have you ever worked for ODNR?

18 A. Yes.

19 Q. How many times?

20 A. I would say on more than five projects,
21 approximately.

22 Q. Since 2001?

23 A. Since 2001 -- the best I can recall,
24 most work was prior to 2001. There have been

1 some since then.

2 Q. Were you employed while you were getting
3 your master's degree?

4 A. Yes.

5 Q. And were you working at Fuller at the
6 time?

7 A. No.

8 Q. Where were you working?

9 A. BBC&M Engineering.

10 Q. When you were obtaining your bachelor's
11 degree in civil engineering, did you work for
12 BBC&M at all during --

13 A. No.

14 Q. -- that time frame?

15 What projects for ODNR did you work on
16 while at BBC&M?

17 A. Jackson Lake State Park is one that I
18 remember.

19 Q. And what role did you have for that
20 project?

21 A. I performed hydrology and hydraulic
22 calculations for a dam improvement.

23 Q. What hydrology and hydraulic modeling
24 did you use?

1 A. It was a long time ago. I believe the
2 best I can recall would have been HEC-1 for
3 hydrology, and I believe dam break for
4 hydraulics.

5 Q. What's the next -- were there any other
6 projects for ODNR that you performed while at
7 BBC&M?

8 A. There may have been others. It's been a
9 while. I recall working on something in
10 Zanesville, another dam project, Zanesville
11 State Nursery Park Dam.

12 Q. Did you perform any hydrology or
13 hydraulic work for that?

14 A. Yes.

15 Q. Did you do any hydrology modeling?

16 A. The best I can recall, yes.

17 Q. Any hydraulic modeling?

18 A. I do not believe that included hydraulic
19 modeling.

20 Q. What hydrology model did you use?

21 A. That would have probably been HEC-1.

22 Q. What's the next project for ODNR you
23 recall working on?

24 A. I may have partially been involved in

1 working on some Muskingum River lock and dam
2 projects, but I didn't have a large role in
3 that. No hydraulics or hydrology.

4 Q. Okay. What's the next project you
5 recall working on for ODNR?

6 A. I don't recall any other ones.

7 Q. How about since -- is it okay if I refer
8 to Fuller and Stantec just as Stantec?

9 A. Yes.

10 Q. How about since you joined Stantec, what
11 ODNR projects have you worked on?

12 A. Projects for ODNR? I was -- I do not
13 believe I've been -- we had a project for ODNR
14 called the South Fork Licking River project, but
15 I did not -- I might have done a couple little
16 things on that. It was not a major -- I did not
17 have a large role in that project.

18 Q. When did you start working on a project
19 at Stantec that involved the Grand Lake
20 St. Mary's?

21 A. Again, I'm horrible with dates, but if I
22 remember correctly, it would have been October
23 of 2009.

24 Q. Okay.

1 A. Fall of 2009.

2 Q. Were you aware of any ongoing Stantec
3 projects related to the Grand Lake St. Mary's at
4 that time?

5 A. No.

6 MR. FUSONIE: Before we get any further,
7 while I remember, during Dr. Campbell's -- or
8 right after Dr. Campbell's deposition yesterday,
9 I asked for Mr. Henson's notes from that
10 deposition Mr. Henson attended, which I allowed
11 him to attend. He took notes during that
12 deposition, and he exchanged notes, as well,
13 with a representative of ODNR, as well as
14 counsel for the respondents in this case. I
15 have asked for those notes and they have not
16 been provided to me today.

17 It's my understanding that the position
18 currently ODNR is taking is that those notes are
19 in Mr. Henson's capacity as a consulting expert.
20 It's my position that those notes relate to one
21 of his areas in which he is a testifying expert.

22 Have I accurately stated the
23 disagreement between the parties?

24 MS. WORLY: Our position is that those

1 notes reflect only Mr. Henson's role as a
 2 consultant during the course of the deposition.
 3 They have nothing to do with anything that
 4 Mr. Henson used, not data, not facts, in
 5 creating either his affidavit or his report, and
 6 have no bearing whatsoever on the testimony or
 7 the supplemental report that he's giving today.
 8 However, let's see how the testimony develops
 9 and perhaps we'll reconsider.

10 MR. FUSONIE: Okay.

11 BY MR. FUSONIE:

12 Q. So the first time you've worked on a
 13 project for ODNR related to the Grand Lake
 14 St. Mary's was October, 2009, is that the best
 15 of your recollection?

16 A. That's to the best of my recollection.

17 Q. Is that the project in which you are
 18 here today talking -- testifying?

19 A. Yes.

20 Q. And it's the project in which you've
 21 prepared -- you prepared a March 1 report?

22 A. Yes.

23 Q. And you prepared a supplemental report
 24 dated today?

1 A. Yes.

2 Q. Let me go while you were at BBCM. Did
3 you ever do any projects for ODOT? Do you know
4 what I mean by ODOT?

5 A. The Ohio Department of Transportation?

6 Q. Right.

7 Did you do any projects for them?

8 A. I do not recall working on ODOT
9 projects.

10 Q. How about since joining Stantec, have
11 you worked on any ODOT projects?

12 A. I recall something, I don't remember the
13 exact date, in I believe it was Lawrence County.
14 Slope stability projects where I assisted and we
15 were working for an ODOT district.

16 Q. Did you perform any hydrology or
17 hydraulic modeling for that project?

18 A. No.

19 Q. Have you ever before your affidavit in
20 this lawsuit prepared an affidavit for purposes
21 of testifying in litigation?

22 A. No.

23 Q. In 2009, what percentage of your work
24 was for governmental entities?

1 A. I would estimate 95 percent.
2 Q. How about 2008, would it be about the
3 same?
4 A. It would be about the same.
5 Q. 2007, would it be about the same?
6 A. It would be, yes, about the same.
7 Q. When did you -- I'm not sure I asked
8 this. I apologize if I did. When did you join
9 Fuller Stantec?
10 A. I believe it was 2003.
11 Q. Has it been since 2003 consistently 95
12 percent of your time working for governmental
13 entities, approximately?
14 A. It can vary at any given time, but I'd
15 say rarely under 75 percent.
16 Q. Okay. Prior to October of 2009, had
17 you -- let me ask you this: When was the first
18 time you visited the Grand Lake St. Mary's?
19 A. For this project.
20 Q. No, I mean ever.
21 A. The first time I ever visited Grand Lake
22 St. Mary's was for this project.
23 Q. Okay. When was your first visit, then,
24 to the lake?

1 A. Again, if I recall correctly, it would
2 have been the end of 2009. November.

3 Q. Okay. Would your answer be the same as
4 far as the Beaver Creek, that you had never
5 visually observed the Beaver Creek in Mercer
6 County prior to the end of 2009?

7 A. Yes.

8 Q. Would your answer be the same for the
9 Wabash River in Mercer County, that you had
10 never visited the Wabash River in Mercer County
11 prior to the end of 2009?

12 A. Yes.

13 Q. October, 2009, tell me about your first
14 contact with ODNR about this project.

15 A. I believe that Dave Moore with ODNR
16 contacted Brian Ringley about assisting on the
17 project.

18 Q. And who is Brian Ringley?

19 A. He is -- he works for Stantec, and I
20 report to him.

21 Q. Were you involved in that first contact?

22 A. No.

23 Q. What was your first -- did Brian Ringley
24 then talk to you about his conversation with

1 David Moore?

2 A. Yes.

3 Q. And what did Brian Ringley tell you?

4 A. To the best of my recollection, they
5 wanted a meeting the following day to discuss
6 the project.

7 Q. And what was the project as far as you
8 understood it at that time?

9 A. At that time, we didn't know.

10 Q. And did you meet the next day?

11 A. I believe it was the next day or shortly
12 thereafter.

13 Q. Do you remember who you met with?

14 A. Dave Moore. Mark Ogden might have been
15 there. As best I can recall, Dave Moore,
16 possibly Mark Ogden, and there were two
17 Assistant AGs that worked for ODNR. Rachel, I
18 remember, and then Ray Studer, I believe.

19 Q. Rachel Stelzer and Ray Studer?

20 A. I believe that's correct.

21 Q. And did they explain at all the issues
22 involved in the project?

23 A. Yes.

24 Q. What did they tell you?

1 MS. WORLY: Objection to the extent that
2 it calls for attorney work product, that would
3 be especially Corps work product, I think would
4 be privileged information.

5 MR. FUSONIE: Well, I think I'm entitled
6 to understand from him at least his
7 understanding as to the scope of his project in
8 which he then submitted an affidavit and report.

9 MS. WORLY: And I think he can tell you
10 his understanding. But I think it -- I don't --
11 I'm instructing him not to repeat specifically
12 what was told to you by either attorney.

13 MR. FUSONIE: Fair enough.

14 BY MR. FUSONIE:

15 Q. What was your understanding from that
16 meeting as to the scope of the potential
17 project?

18 A. There was the desire to perform
19 hydrologic and hydraulic calculations for the
20 Grand Lake St. Mary's and the reach of Beaver
21 Creek and Wabash River to the state line.

22 Q. And ultimately, what was the scope of
23 the project that led to the -- your affidavit in
24 this lawsuit?

1 A. I believe it's described in the report.

2 Q. Okay. I want your answer to my question
3 as you sit here today.

4 A. Can we open up the report and I can read
5 it to you?

6 Q. Sure. Just so the record's clear,
7 Mr. Henson is opening a binder that he has come
8 here with, which is the -- is that the technical
9 report?

10 A. This is.

11 It was to perform hydrologic and
12 hydraulic analysis for the reach -- for the
13 Grand Lake St. Mary's, the spillway, and the
14 reach of Beaver Creek and Wabash River to the
15 state line.

16 Q. Okay. Did they also ask you to -- was
17 part of your project also to review work done by
18 Dr. Campbell?

19 A. Yes.

20 Q. And were you provided any documents to
21 review prepared by Dr. Campbell?

22 A. Yes.

23 Q. And do you have any knowledge as to
24 whether -- what documents were you provided to

1 review?

2 A. I believe there were several reports
3 from some previous litigation.

4 Q. Are you -- do you have any knowledge as
5 to whether you were provided the full reports
6 from those litigations or not?

7 MS. WORLY: Objection. Do you want to
8 clarify what you mean by "full reports"?

9 Q. Mr. Henson, you have not come here today
10 with any reports of Dr. Campbell that are in
11 your files, have you?

12 A. No.

13 Q. Do you have reports of Dr. Campbell in
14 your files?

15 A. Yes.

16 MR. FUSONIE: I would ask for a copy of
17 those.

18 Q. Just so the record's clear, you also
19 have a written contract with ODNR, don't you, or
20 Stantec does?

21 A. Yes.

22 Q. And you have not come here today with a
23 copy of that contract?

24 A. No.

1 Q. Are there any supplements to that
2 contract?

3 A. I am not involved in the contracting,
4 but to the best of my knowledge, yes, there
5 were.

6 Q. And you haven't come here as the Stantec
7 representative today with any of those?

8 A. Correct.

9 Q. Has Stantec invoiced either ODNR or the
10 Attorney General's office for any of its work
11 performed?

12 A. Yes.

13 Q. And you haven't come here today with any
14 of those invoices, have you?

15 A. No.

16 MR. FUSONIE: I'd ask for a copy of
17 those supplements and a copy of the invoices.

18 MS. WORLY: Can I ask that you send us
19 an e-mail with regard to specifically those
20 documents that you want from us that you've not
21 yet received?

22 MR. FUSONIE: Sure. I would state that
23 he was served -- Mr. Henson specifically was
24 served with a subpoena for documents to be

1 produced today last Friday that would have
2 covered those documents that are now -- the
3 contract, supplemental agreements, invoices, and
4 he hasn't come here today with them. But I will
5 confirm my request again in an e-mail.

6 MS. WORLY: Thank you.

7 MR. COLE: Can we just go off the record
8 for a second?

9 MR. FUSONIE: Sure.

10 (Discussion held off the record.)

11 BY MR. FUSONIE:

12 Q. Mr. Henson, I'm going to show you what
13 has been previously marked as Relators'
14 Deposition Exhibit D, which I will represent to
15 you is a report by Dr. Campbell for the Case
16 Leasing property that is an addendum dated
17 November, 2006, which includes a number of
18 attachments to it.

19 A. Uh-huh.

20 Q. Have you seen this document before?

21 A. Yes.

22 Q. And when did you first see the document?

23 A. I don't recall the exact date. Sometime
24 after October, 2009.

1 Q. Were you -- I want to turn -- at the
2 back of Exhibit D, there's a Tab B. Do you see
3 that?

4 A. Yes.

5 Q. And then it's stated on the next page,
6 Appendix B, lake elevation data.

7 A. Yes.

8 Q. Were you ever provided Appendix B?

9 A. Yes.

10 Q. When were you provided Appendix B?

11 A. Again, I do not recall the exact date.
12 I do recall that Rachel Stelzer brought over a
13 copy of a CD that had Appendix B on it to our
14 office.

15 Q. And do you know if she did that before
16 you signed your affidavit on March 1, 2009?

17 A. Yes.

18 MS. WORLY: Off the record.

19 MR. FUSONIE: Sure.

20 (Discussion held off the record.)

21 MR. FUSONIE: We have his report on a
22 disk, which I'm trying to figure out the best
23 way to introduce it into the record. He's come
24 here with binders, which will be a lot easier to

1 use, of the report, during the deposition. The
2 disk is right -- I have a copy of it, March 1,
3 2010. Can I introduce -- I'll introduce this as
4 his report, but use the binders to mostly ask
5 him questions.

6 MS. WORLY: Why don't you ask on the
7 record -- we're off the record right now?

8 MR. FUSONIE: We're on the record. But
9 the issue is that to open this up for me to
10 confirm that this is his March 1, 2010 report is
11 going to be difficult and may crash our computer
12 because of the mapping that's on this disk.

13 MS. WORLY: Why don't you just ask him
14 to make a representation that they are both the
15 same.

16 MR. FUSONIE: I don't know how he can do
17 that. We can stipulate to --

18 MS. WORLY: Is that what --

19 MR. FUSONIE: I will represent that this
20 is a copy of what you provided to us on March
21 1st, 2010.

22 MR. COLE: Didn't I drop off one that
23 was supposed to be more user friendly? It was
24 the same thing.

1 MR. FUSONIE: Yeah, but that's not
2 what's attached to his affidavit.
3 MR. COLE: Okay.
4 MR. FUSONIE: His affidavit has got --
5 MS. WORLY: If you can represent that's
6 a copy of what he provided, then he can
7 represent to you that it's the same thing as
8 what's contained in the binders, I would assume,
9 if you ask him the question.
10 MR. FUSONIE: Okay.
11 BY MR. FUSONIE:
12 Q. Assuming that I am telling you the
13 truth, that this is a copy of your March 1st,
14 2010 report, as provided to me on March 1st,
15 2010, will you represent that this is the same
16 document as the binders that you have come here
17 with today?
18 A. With one exception, yes.
19 Q. What's the one exception?
20 A. In Report 1 --
21 Q. The modeling is not in your binders, is
22 it?
23 A. The modeling is not in the binders, you
24 are correct.

1 And also, Table 2.5 of Report 1 has been
2 updated from what is on that.

3 Q. And you haven't printed off a copy of
4 that update?

5 A. The updated table is in this binder.

6 Q. It's in which binder?

7 A. Right here.

8 MS. WORLY: (Indicating).

9 Q. All right. I'm going to try to do this
10 again.

11 --0--

12 (Relators' Exhibit H marked.)

13 --0--

14 BY MR. FUSONIE:

15 Q. Back on the record, Mr. Henson, I have
16 marked as Exhibit H what I am representing to
17 you is a copy of the report -- your report
18 attached to your affidavit, dated March 1st,
19 that I received on March 1st.

20 Will you agree on the record, based on
21 my representation, that Exhibit H is the same as
22 your binders, except for that your binders do
23 not include your modeling data, and that you
24 have updated in your binder Figure 2.5 to the

1 technical report?

2 A. Yes.

3 Q. - okay. All right. If you could turn to
4 your binder that's the discussion of results and
5 other analyses.

6 MS. WORLY: (Indicating).

7 THE WITNESS: That would be the other
8 one, I believe.

9 Q. Would you agree with me that you looked
10 at 88 relator parcels?

11 A. I don't recall the exact number --

12 Q. okay.

13 A. -- I looked at.

14 Q. If you turn to your map, impacts to peak
15 flooding due to spillway improvements for July,
16 2003 flood event.

17 A. Uh-huh.

18 Q. Are you there?

19 A. I'm there.

20 Q. You have parcel -- is this a map that
21 you prepared or you had someone prepare?

22 A. It was prepared under my direction, yes.

23 Q. Would you agree that the parcel legend
24 identifies 88 parcels?

1 A. Yes.

2 Q. Was it your understanding that these are

3 parcels of relators in this lawsuit?

4 A. Those were provided to me by ODNR.

5 Q. So those are parcels that you were

6 supposed to plot on these legends?

7 A. They were provided to me by ODNR.

8 Q. And what was your understanding --

9 A. We placed them on the map.

10 Q. Okay.

11 A. Yes.

12 Q. Did they give you any understanding as

13 to what those parcels were?

14 A. It was my understanding that those

15 parcels represented relators -- parcels owned by

16 relators in the pending lawsuit.

17 MS. WORLY: Just so we don't have this

18 constant difficulty, let him finish his question

19 before you begin a answer. Let him finish an

20 answer before you start a question.

21 MR. FUSONIE: I will do my best. It's

22 getting long in the day for me.

23 Q. If you can turn, then, to 2.4.

24 A. Is it section number, or table?

1 Q. It is on Page 2.4, starts Table 1.
2 A. Okay.
3 Q. All right. You have identified in Table
4 1 a number of parcels that are impacted by
5 increased maximum depth of flooding during the
6 15-year event; is that correct?
7 A. Yes.
8 Q. And by 15-year event, what do you mean?
9 A. That means the event that would be
10 expected to occur once every 15 years.
11 Q. Okay.
12 A. Or if you're talking probabilities, I
13 don't know what -- that's like -- yeah, I'll
14 just stay with that. Once every 15 years.
15 Q. Well, for example, FEMA says a
16 hundred-year flood, for example, is something
17 that has a 1 percent chance of occurring every
18 year; is that correct?
19 A. Correct.
20 Q. Okay. So a 15-year event has a -- some
21 sort of higher percentage of occurring every
22 year, correct?
23 A. Correct.
24 Q. And then Table 2 are parcels impacted by

1 increased duration of flooding during a 15-year
2 event; is that correct?

3 A. Correct.-

4 Q. Would you agree with me that the parcels
5 listed in Table 1, because they have an
6 increased acreage, flooded during the 15-year
7 event, also have an increased duration of
8 flooding during the 15-year event?

9 A. Yes.

10 Q. Would you agree with me, then, that --
11 and I've -- that 61 out of the 88 parcels of
12 relators that you looked at have a longer
13 duration during a 15-year event?

14 A. I didn't count the number, but if --

15 Q. You have no reason to disagree with my
16 calculation?

17 A. If there's 68 --

18 MS. WORLY: Objection. Don't guess. If
19 you know, you know. If not, you don't.

20 Q. You can count all of them for me if
21 you -- I was trying to speed things along.

22 A. If there's 68 parcels in Table 2, then
23 your previous statement is true.

24 MS. WORLY: Objection. I believe he

1 stated there was 61.

2 THE WITNESS: 61.

3 MR. FUSONIE: I wasn't going to fight
4 you on that one.

5 Q. Now turning to Table 4, those are
6 parcels that are -- based on your modeling, have
7 been impacted by increased maximum depth of
8 flooding during the hundred-year event; is that
9 correct?

10 A. Correct.

11 Q. And then Table 5 are parcels impacted by
12 increased duration of flooding during the
13 hundred-year event, correct?

14 A. Correct.

15 Q. But you would agree with me that Table
16 4, those parcels also, because more acreage is
17 flooded, are impacted by an increased duration
18 of flooding during the hundred-year event; is
19 that correct?

20 A. They have a longer duration of flooding,
21 yes.

22 Q. And do you have any reason to disagree
23 with me that, if I combine Table 4 and Table 5,
24 that is 71 of the 88 parcels that you were

1 provided by the state?

2 A. Again, I haven't counted them, but I
3 have no reason to...

4 Agree.

5 Q. Okay. For Table 1, I counted 10 parcels
6 that have more acres flooded during the 15-year
7 event; is that correct?

8 A. Correct.

9 Q. Table 4, I counted 20 parcels that have
10 increased acreage flooded during a hundred-year
11 event; is that correct?

12 A. Correct.

13 Q. Okay. Would you agree with me that in
14 Table 4, there's no reference to an owner by the
15 name of Granger?

16 A. Correct.

17 Q. There's no owner identified as Mary
18 Leone Powell?

19 A. Correct.

20 Q. There's no owner identified as Opal
21 Post?

22 A. Correct.

23 Q. There's no owner identified as Wayne
24 Doner?

1 A. Correct.

2 Q. There's no owner identified as Duane
3 Sheets?

4 A. Correct.

5 Q. There's no owner identified as Rita
6 Suhr, S-u-h-r?

7 A. Correct.

8 Q. Nor Linda Linn, L-i-n-n?

9 A. Correct.

10 Q. Nor Dorothy Schroyer, S-c-h-r-o-y-e-r?

11 A. Correct.

12 Q. Okay. And then if you turn to Table 7,
13 you've identified in Table 7 20 parcels that
14 have acres impacted by the new spillway; is that
15 correct?

16 A. Correct.

17 Q. And would you agree with me that none of
18 those parcels that you've identified are near or
19 west of the confluence of the Wabash and Beaver?

20 A. We would have to look at the map to
21 confirm.

22 Q. Okay. Let's do that. Let's turn to
23 your map showing impacts to peak flooding due to
24 spillway improvements for hundred-year flood

1 event.

2 MS. WORLY: For the record, which -- is
3 there a number on that?

4 MR. FUSONIE: No.

5 Q. I believe the farthest west property
6 that you have identified in Table 7 is the
7 McDonough property, which, in your legend for
8 this map, is Parcel Number 37, which is right
9 here (indicating).

10 Do you have any reason to disagree with
11 me on that?

12 MS. WORLY: Take a minute and look at
13 it.

14 (Pause in proceedings.)

15 A. Could you restate the question, please?

16 Q. Sure. For Table 7, the farthest west
17 property that you listed is the McDonough
18 property, which, on your legend, is identified
19 as Parcel 37.

20 (Pause in proceedings.)

21 A. It would take a while for me to confirm
22 all those.

23 Q. Number 12 is right there (indicating).

24 MR. COLE: Which one is 37?

1 THE WITNESS: 37 is there (indicating).

2 A. To the -- yes, that should be the
3 furthest west property.

4 Q. On Table 7?

5 A. On Table 7.

6 Q. Okay. Just so I'm clear about this map,
7 which is impacts on -- to peak flooding due to
8 the spillway improvements for the hundred-year
9 flood event, you have a yellow in the legend
10 that's indicated for increased flooding?

11 A. Uh-huh.

12 Q. And -- is that a yes?

13 A. Yes.

14 Q. And increased flooding is the flooding
15 that is due to the spillway improvements for the
16 hundred-year flood event?

17 A. Yes.

18 Q. Okay. would you agree with me that
19 parcel 15 has yellow?

20 A. Yes.

21 Q. Would you agree with me that you did not
22 identify it on Table 7?

23 A. Yes.

24 Q. would you agree with me that Parcel 55

1 has yellow?

2 A. Yes.

3 Q. And would you agree with me that you did
4 not identify that on Table 7?

5 A. Yes.

6 Q. Would you agree with me that Parcel 54
7 has yellow?

8 A. Yes.

9 Q. And you did not identify that on Table
10 7, did you?

11 A. No.

12 Q. Would you agree with me that Parcel 66
13 has yellow?

14 A. Yes.

15 Q. And you did not identify that parcel on
16 Table 7?

17 A. No.

18 Q. Would you agree with me that 49 has
19 yellow?

20 A. Yes.

21 Q. And you did not identify 49 on Table 7,
22 did you?

23 A. No.

24 Q. Would you agree with me that Parcel 8

1 has yellow?

2 A. It's hard to tell if that map's yellow.

3 Q. If I -- you don't know for sure whether
4 that's yellow or not without me zooming in?

5 A. Correct.

6 Q. But it's possible that that's yellow?

7 MS. WORLY: Objection.

8 If you know.

9 A. I don't know.

10 MR. FUSONIE: Can we zoom in on Parcel

11 8?

12 Q. While she's doing that, did I ask about
13 66? I think I did, but just so the record's
14 clear, Parcel 66 has yellow?

15 A. Yes.

16 Q. And you didn't identify Parcel 66 on
17 Table 7?

18 A. No.

19 Q. I'll ask you about Parcel 76. Would you
20 agree with me there's some yellow in Parcel 76?

21 A. Again, it's hard to tell.

22 Q. I'm trying to find Parcel 60.

23 A. (Indicating).

24 Q. Would you agree with me that Parcel 60

1 has some yellow?

2 A. No.

3 Q. Without zooming in --

4 A. I can't see.

5 Q. While Martha's trying to load a
6 zoomed-in map, would you agree with me that
7 Parcel Numbers 15, 54, 55, you did not identify
8 in Table 4 of your report? I'll represent that
9 the owner of 15 is David Granger, and the owner
10 of 54 and 55 is Mary Leone Powell and Larry
11 Pugsley, P-u-g-s-l-e-y.

12 A. I do not see them in Table 4.

13 Q. And Parcel 66, which is owned by Duane
14 Sheets, you do not have in Table 4?

15 A. Correct.

16 Q. So would you agree with me that Table 4
17 is inaccurate?

18 A. No.

19 Q. Table 4 is not inaccurate?

20 A. Correct.

21 Q. You have yellow -- the yellow, as you
22 testified to, is increased flooding caused by
23 the spillway. You have yellow in David
24 Granger's property, yet you don't identify David

1 Granger in Table 4, and your testimony under
2 oath is that Table 4 is still accurate?

3 A. Table 4 is based on elevations in the
4 model. When you map -- there's inherent
5 differences when you map using the GIS.

6 Q. What is Table 7 based on, the GIS?

7 A. Table 7 is based on, as I recall, the
8 parcels identified in Table 1 and 4.

9 Q. Which don't include -- Table 4 does not
10 include properties by David Granger or Leone
11 Powell or Duane Sheets?

12 (Pause in proceedings.)

13 A. What was the last question?

14 Q. Table 4 does not include property by
15 David Granger or Leone Powell or Duane Sheets,
16 correct?

17 A. Correct.

18 Q. It's your -- your map, you would agree
19 with me -- you've already agreed with me it
20 shows yellow, which is increased flooding by the
21 spillway, as your map represents, for Parcel 15,
22 which is owned by David Granger, correct? David
23 Granger (indicating).

24 A. Correct.

1 Q. And the answer's the same for 55
2 (indicating), which is owned by Leone Powell and
3 Larry Pugsley?

4 A. Correct. It shows yellow on the map.

5 Q. And 54 does, and 66, correct?

6 A. Correct.

7 Q. We'll try now --

8 A. Go ahead.

9 Q. Try 8. We can zoom 8.

10 Mr. Henson, we have zoomed in Parcel
11 Number 8, which I will represent to you we
12 zoomed in on your impacts to peak flooding due
13 to spillway improvements for hundred-year flood
14 event. Would you agree with me that the
15 zoomed-in Parcel 8 shows yellow?

16 A. Yes.

17 Q. Okay. And Parcel 8, I will represent to
18 you, is owned by Wayne Doner, which you had
19 earlier testified was not an owner identified on
20 Table 4. Do you recall that testimony?

21 A. Yes.

22 Q. Okay. And then we'll go to 76. Do you
23 see the yellow in Parcel 76?

24 A. Yes.

1 Q. And I'll represent to you that 76 is
2 owned by Rita Suhr, S-u-h-r. Would you agree
3 with me that in Table 4, you do not identify an
4 owner by the name of Rita Suhr?

5 A. Yes.

6 Q. We have zoomed in to Parcel 60. Do you
7 see the yellow in Parcel 60?

8 A. Yes.

9 Q. And I'll represent to you that the owner
10 of Parcel Number 60 is Dorothy Schroyer. Would
11 you agree with me that Table 4 does not identify
12 Dorothy Schroyer as an owner?

13 A. Correct, yes.

14 Q. So would you agree with me, then, that
15 your map impacts the peak flooding due to the
16 spillway improvements for hundred-year flood
17 event shows that there has been an impact to
18 properties near the confluence of the Wabash and
19 Beaver Creek?

20 A. I agree that the map shows yellow.

21 Q. Okay.

22 A. Yes.

23 Q. And this is a Stantec map?

24 A. Yes.

1 Q. It was generated either by you or under
2 your supervision, correct?

3 A. Correct.

4 Q. And this map is attached to your
5 affidavit?

6 A. Correct.

7 Q. And your affidavit is an under-oath
8 document.

9 A. Correct.

10 Q. I'll let you fold this back
11 (indicating).

12 Actually, there's one more. 36.

13 Mr. Henson, we've zoomed in on Parcel
14 Number 36. Would you agree with me that there
15 is some yellow in Parcel Number 36?

16 A. There is one pixel of yellow on Parcel
17 Number 36.

18 Q. Okay. And I'll represent to you that
19 the owner of Parcel Number 36 is Linda Linn and
20 Lee Fennig. Would you agree with me that Table
21 Number 4 does not identify as an owner either
22 Linda Linn or Lee Fennig, F-e-n-n-i-g?

23 A. Agree.

24 Q. Okay. Do you know what the -- let me

1 ask you this: When you prepared your report on
2 March 1, 2010, prior to that date, did you know
3 what the lake elevation was on July 2nd, 2003?

4 A. Yes, I believe we had lake records from
5 ODNR.

6 Q. Were you aware of a rain event in late
7 June of 2003 before you signed your affidavit on
8 March 1, 2010?

9 A. In late June --

10 Q. Uh-huh.

11 A. -- of 2003?

12 Q. Yes.

13 A. I could not say I was aware of that.

14 Q. Okay. Now, for your report in this
15 case, you used the HEC-HMS modeling for
16 hydrology?

17 A. Correct.

18 Q. And I believe you testified before that
19 you had used it some before this project; is
20 that correct?

21 A. That's correct.

22 Q. Had you ever used it to submit a
23 floodplain model to FEMA?

24 A. Yes.

1 Q. When did you do that?

2 A. On numerous occasions.

3 Q. Which floodplain models -- or which
4 floodplains did you submit a model for?

5 A. A few that come to mind offhand were --
6 are Stark County, Ohio, Dawson County, Nebraska.
7 I'm sure there are others. I don't recall any
8 right now.

9 Q. Okay. Do you remember -- for the one
10 for Stark County, do you remember what hydraulic
11 modeling accompanied the hydrology model?

12 A. Yes.

13 Q. What was it?

14 A. HEC-RAS.

15 Q. And what mode of HEC-RAS?

16 A. Can you clarify?

17 Q. Was it submitted in steady mode?

18 A. It was a steady flow analysis.

19 Q. How about the Dawson County, Nebraska
20 one, do you remember the hydraulic model that
21 was used?

22 A. Yes.

23 Q. And what was it?

24 A. FLO-2D.

1 Q. Was that a steady flow analysis?
2 A. No.
3 Q. Did it have a steady flow component?
4 A. No.
5 Q. What type of flow analysis was it?
6 A. Unsteady two-dimensional flow.
7 Q. Okay. So it wasn't a single-dimensional
8 unsteady flow analysis?
9 A. Correct.
10 Q. Have you ever submitted a floodplain
11 model to FEMA that included a HEC-RAS hydraulic
12 model that was an unsteady one-dimensional?
13 A. Not to FEMA that I recall.
14 Q. Okay. Would you, Mr. Henson, agree with
15 me that HEC-HMS has a number of alternative
16 procedures and settings?
17 A. Yes.
18 Q. Would you agree with me that the proper
19 selection and use of HEC-HMS requires a high
20 level of hydraulic expertise --
21 A. Yes.
22 Q. -- hydrologic, I mean, expertise?
23 A. Yes.
24 Q. The HEC-HMS model that you prepared for

1 ODNR in this case, did you calibrate it using
2 the stream flow gage at the Linn Grove gage
3 station on the Wabash River?

4 A. No.

5 Q. Am I correct that your HEC-HMS model for
6 this -- for your report was not in continuous
7 simulation mode?

8 A. Correct.

9 Q. And for the loss method you used, it was
10 the Soil Conservation Service loss method?

11 A. Correct.

12 Q. Is one other option the soil moisture
13 accounting method?

14 A. I believe that's an option.

15 Q. And is Green-Ampt a recognized option?

16 A. Yes.

17 Q. For the SCS method, is the loss the same
18 whether there's -- whether the rainfall occurs
19 in one hour or one day?

20 MS. WORLY: Objection; compound.

21 why don't you break it up.

22 Q. For the SCS method, is the loss the same
23 for one hour of rainfall as it is for one day of
24 rainfall?

- 1 A. That would depend on the rainfall
2 amount.
- 3 Q. So for some rainfall amounts, the loss
4 is the same whether the rainfall occurs in one
5 hour or one day?
- 6 A. It depends on the amount of rainfall.
- 7 Q. Yes. So for some rainfall amounts, the
8 loss is the same for one hour as it is for one
9 day? Am I correct on that?
- 10 A. Correct. The initial abstraction could
11 be the same for -- in certain cases, for a one
12 day and one --
- 13 Q. One hour?
- 14 A. -- one hour.
- 15 Q. Am I correct that the units hydrograph
16 method you used is the SCS method?
- 17 A. Correct.
- 18 Q. Are you familiar with the Snyder's
19 united hydrograph method?
- 20 A. Snyder's unit hydrograph method?
- 21 Q. I'm sorry. Unit hydrograph method.
- 22 A. Yes.
- 23 Q. Are you familiar with the two-parameter
24 Clark's hydrograph method?

1 A. I have not used it, but I have heard of
2 it, yes.

3 Q. Are you familiar with the kinematic wave
4 method?

5 A. Yes.

6 Q. Is the SCS unit hydrograph method a
7 single-peaked hydrograph?

8 A. For a given watershed, yes.

9 Q. And is that how you used it in your
10 report in this action?

11 A. In this action, the watershed was broken
12 up into many subwatersheds so that they could
13 combine and produce a multipeaked hydrograph.

14 Q. Okay. Is it a -- so I understand, is
15 the SCS unit hydrograph method a one-parameter
16 hydrograph technique?

17 A. No.

18 Q. How is it not a one-parameter hydrograph
19 technique?

20 A. It has a time of concentration or lag
21 time. Correction. The transform method uses
22 lag time as the single parameter, one parameter.

23 Q. So it's a one parameter?

24 A. Correct.

1 Q. Okay. Am I correct that for your
2 HEC-HMS model in this matter, there were only
3 four subwatersheds used?

4 A. That is incorrect.

5 Q. So there were -- let me -- I take that
6 back.

7 For the flow into the Grand Lake
8 St. Mary's in your report, there were only four
9 subwatersheds?

10 A. Correct. Four subwatersheds in the
11 Grand Lake St. Mary's.

12 Q. Am I correct that you used the TR-55
13 approach to calculate subwatershed concentration
14 times?

15 A. Correct.

16 Q. Are you aware that that's not an
17 appropriate method to use for wide-open fields
18 with sheet flow routes longer than 300 feet?

19 A. That is not the case here. The first
20 300 feet is assumed sheet flow. The next
21 portion is assumed shallow concentrated flow.
22 And then once it gets into a river or channel,
23 channel flow. So it contains all three of those
24 components.

1 Q. My question was: Are you aware that
2 it's not appropriate to use the TR-55 method for
3 wide-open fields with sheet flow routes longer
4 than 300 feet?

5 A. I am aware that longer than -- sheet
6 flow should not be used longer than 300 feet,
7 correct.

8 Q. In fact, they shouldn't be used longer
9 than 100 feet; am I correct?

10 A. Best I recall -- I don't remember -- I
11 do not recall right now whether the TR-55
12 guidance uses 100 or 300 feet as the sheet flow.

13 Q. Okay.

14 MR. FUSONIE: I'm at a change in
15 subject. Now would be an okay time for a break
16 if people want a five-minute stretch break.

17 MS. WORLY: Okay.

18 (Recess taken.)

19 BY MR. FUSONIE:

20 Q. Mr. Henson, back on the record, I'm
21 going to move on to asking you about your
22 hydraulic model that you used. You used
23 HEC-RAS, correct?

24 A. Correct.

1 Q. And you used it in unsteady mode?
2 A. Correct.
3 Q. And was that one-dimensional unsteady
4 mode?
5 A. Yes.
6 Q. Are you familiar with the program
7 CHECK-RAS?
8 A. Yes.
9 Q. Would you agree with me that that's a
10 quality assurance program?
11 A. Yes.
12 Q. Do you agree that CHECK-RAS can be used
13 to quality check HEC-RAS in steady mode?
14 A. Yes.
15 Q. Do you agree with me that CHECK-RAS
16 cannot be used to quality check HEC-RAS in
17 unsteady mode?
18 A. That's my understanding.
19 Q. Okay. Would you agree with me in
20 HEC-RAS, that a hydrograph is required for each
21 tributary to the waterway being modeled?
22 MS. WORLY: Objection. Do you want to
23 talk in terms of this particular study, or in
24 general?

1 MR. FUSONIE: I'm talking in general.

2 A. Every single tributary does not always
3 need a separate hydrograph.

4 Q. That's your testimony, generally?

5 A. Correct.

6 Q. And for the -- did you, for each
7 tributary to the Beaver Creek, prepare a
8 hydrograph?

9 A. I do not believe we did for every single
10 tributary.

11 Q. Okay. The hydrographs for tributaries,
12 does the data come from, in this example,
13 HEC-HMS?

14 A. Yes.

15 Q. Okay. In HEC-RAS used in unsteady mode,
16 does that show discharge attenuating in a
17 downstream direction?

18 A. It potentially could, yes.

19 Q. And could that then result in -- well,
20 I'm sorry. Does that attenuation result, in
21 part, from the loss of water to floodplain
22 storage?

23 A. In part, yes.

24 Q. Did ODNR provide you with the rating

1 curves that you used for your hydraulic
2 modeling?

3 A. There were no rating curves in the
4 hydraulic model.

5 Q. Did they provide you with the rating
6 curves used in the HEC-HMS model?

7 A. I believe -- my recollection is that
8 those were from a previous report.

9 Q. Do you know who prepared that previous
10 report?

11 A. I believe that it was part of a previous
12 lawsuit, Hartman and Warns.

13 Q. Doyle Hartman, does that sound familiar?

14 A. Yes.

15 Q. Was that a -- was he, as far as you
16 understand, an expert on behalf of ODNR?

17 A. Yes.

18 Q. So you were provided rating curves by
19 ODNR that were used by Doyle Hartman?

20 MS. WORLY: Objection.

21 only to the extent that you know.

22 A. To the extent that I know, they were
23 used by Hartman and by both sides in a former --
24 in a previous suit.

1 Q. Okay.

2 A. One -- the revised report that we
3 brought today actually updates those rating
4 curves for the old spillway.

5 Q. But not for the new spillway?

6 A. The new spillway uses the same -- the
7 March 1st report.

8 Q. Okay. What was the weir coefficient for
9 the old spillway used in the March 1 report?

10 A. I did not -- because we used information
11 that was taken and accepted during previous
12 studies, we did not recalculate it.

13 Q. So your testimony is Stantec did not
14 change the weir coefficient for the old
15 spillway, it just used what was provided to it
16 by ODNR?

17 A. On the March 1st report, I believe there
18 was a data entry error on the -- when we
19 converted -- for both reports, we converted
20 everything from NGVD 29, which is the
21 national -- it's a datum, to NAVD 88. And as I
22 was reviewing stuff earlier this week, I noted
23 that when that conversion was done for the old
24 spillway, the data was entered incorrectly.

1 Q. The weir coefficient was different?

2 A. The rating curve was incorrect.

3 Q. Was part of the reason the rating curve
4 was incorrect was that the weir coefficient was
5 wrong?

6 A. No. I believe it was just data entry
7 error. Just the numbers were typed in wrong.

8 Q. Did it result in a different weir
9 coefficient than what had been provided to you
10 by ODNR?

11 A. ODNR did not provide a weir coefficient.
12 ODNR provided a rating curve.

13 Q. Okay.

14 A. The weir coefficient is part of what you
15 use to get a rating curve.

16 Q. Okay. Do you know what weir coefficient
17 was used to get to the rating curve for the old
18 spillway by Doyle Hartman?

19 A. I do not know. I know that it varied
20 with depth.

21 Q. Do you know, what was the weir
22 coefficient you used for your April 29th
23 supplemental report to get to your new rating
24 curve?

1 A. The same that was used in previous
2 rating curves. It varied with depth. I think
3 it ranged -- to the best of my recollection, it
4 ranged from 2 point something to 3, 3.3. As
5 depth increases, the weir coefficient increases.

6 Q. So your testimony, as you recall, is for
7 your March 1st, 2010 report, your -- the
8 calculated weir coefficient for the old spillway
9 was not higher than the value previously used by
10 ODNR?

11 A. No. My testimony is that for the March
12 1st report, the rating curve was entered into
13 HMS incorrectly. The revised modeling that we
14 provided today has a correct rating curve.

15 Q. Okay. So the report that's attached to
16 your affidavit and under oath has an incorrect
17 rating curve?

18 A. For the old spillway.

19 Q. For the old spillway?

20 A. Correct.

21 Q. And that was a result of a data entry
22 error?

23 A. Correct. It appears the numbers were
24 just typed in wrong.

1 Q. I still am not sure I got an answer to
2 my question, which was, your testimony is that
3 you have no knowledge that the weir coefficient
4 you used in your March 1st, 2010 report is
5 higher than the weir coefficient previously used
6 by ODNR?

7 MS. WORLY: Objection. Used by ODNR at
8 what point in time?

9 Q. Well, by Doyle Hartman.

10 A. I don't think you understand the way
11 that it is entered into the model. You don't
12 have to enter a weir coefficient into the model.
13 The rating curve was given, so for a given pool
14 level, there's a given discharge going over the
15 spillway.

16 Q. So the -- all right. Maybe this -- I'll
17 try this. The rating curve for the March 1st,
18 2010 report was incorrect, correct?

19 A. That is what I previously testified,
20 yes.

21 Q. And did that result in an incorrect weir
22 coefficient?

23 MS. WORLY: Objection. I think it's
24 been asked and answered.

1 MR. FUSONIE: That has not been asked
2 and answered -- that has not been answered.

3 MS. WORLY: If you can answer it, go
4 ahead.

5 A. There is no weir coefficient entered
6 into the model. Just a rating curve. The
7 rating curve was not entered correctly in the
8 March 1st modeling.

9 Q. All right. To try to close this loop,
10 does the rating curve impact what the weir
11 coefficient is going to be?

12 A. Based on a rating curve, you could
13 back-calculate a weir coefficient, and if you
14 were to do that because the numbers were not
15 entered correctly, I'm sure it would look like a
16 weir coefficient that might not make sense.

17 Q. Okay. And I know you've come here today
18 with a few supplemental documents. This
19 correction of the rating curve, is that
20 reflected in the technical back -- the revised
21 April 29, 2010 technical background report
22 (indicating)?

23 A. Yes.

24 Q. Is it also reflected in any other

1 document that you have provided to me here
2 today?

3 A. No.

4 Q. And it's -- I know you said which
5 portion of the technical background has been
6 updated. Can you remind me?

7 A. The HEC-HMS and HEC-RAS modeling, and
8 Table 2.5.

9 Q. To the technical report?

10 A. To the technical report.

11 Q. Okay. Could I see your binder for a
12 moment to compare it with the previous version?

13 Am I correct, then, that the new Table
14 2.5 shows for each event, a lower discharge for
15 the old spillway than what was in the previous
16 version of your report?

17 A. That is correct. I believe by 5 to --
18 on the order of 5 to 7 cubic feet per second.

19 Q. Looks like for -- I'll give this back to
20 you. It looks like it is 5 to 9.

21 A. 5 to 9, sure.

22 Q. I'll let you look at that and tell me
23 whether you --

24 A. That sounds correct.

1 Q. Do you agree with that, that's 5 to 9?

2 A. Yes.

3 Q. So there is now a greater disparity
4 between the discharge occurring from the new
5 spillway versus the old spillway?

6 A. By 5 to 9 CFS, which when run through
7 the hydraulic model, has a maximum impact of a
8 quarter of an inch (indicating).

9 Q. Okay. Let me first start with the
10 difference between the two spillways, as far as
11 the discharge has increased, correct?

12 A. Correct.

13 Q. And you're saying that it is a --
14 through the hydraulic model, there's a maximum
15 impact of a quarter of an inch. Quarter of --
16 what do you mean by quarter of an inch?

17 A. I mean if you had an inch and took a
18 quarter of it, that would be a quarter of an
19 inch (indicating).

20 Q. Quarter of an inch as to the elevation
21 level?

22 A. Of the maximum -- of the peak flood
23 elevation.

24 Q. Got it.

1 Okay. Have you run -- have you mapped
2 the impacts to peak flooding due to spillway
3 improvements for the hundred-year flood event
4 using the updated discharge?

5 A. The mapping was not updated.

6 Q. Okay.

7 A. Because that quarter of an inch does not
8 show up at map scale, or is not significant.

9 Q. According to you. You made that
10 decision that it wasn't significant?

11 A. Yes.

12 Q. Okay. Am I correct that you have not
13 run -- you have not determined a peak spillway
14 flow for the old spillway if the old spillway
15 had been in place for the July, 2003 event?

16 A. I don't believe it was reported. I do
17 recall making a run in the models.

18 Q. And what do you recall about the peak
19 spillway flow using the old spillway?

20 A. I would have to go back and look at the
21 results.

22 Q. What type of document do you have that
23 reflects that?

24 A. The modeling that was provided.

1 Q. The modeling that was provided to me, to
2 Vorys, has a run showing the July, 2003 event
3 with the old spillway in place?

4 A. I would have to double check that to
5 verify.

6 Q. But you remember doing such a run?

7 A. Yes.

8 MR. FUSONIE: I don't believe we got
9 that. I'll have to confirm that.

10 MS. WORLY: Confirm.

11 MR. FUSONIE: It might be faster for
12 Mr. Henson to confirm it. But if we didn't get
13 it, I would ask for that run.

14 MS. WORLY: If you don't have it, put it
15 in your e-mail.

16 MR. FUSONIE: Well, I'll make a request
17 that he confirm from his end, as well.

18 MR. COLE: We'll check with him.

19 MR. FUSONIE: Thanks.

20 BY MR. FUSONIE:

21 Q. Do you remember that it was lower than
22 the peak spillway flow from the new spillway for
23 the July, 2003 event?

24 A. Yes, I do remember.

1 Q. Is it -- you have -- for a hundred-year
2 event and 15-year event, your mapping does show
3 that there is increased acreage flooded with the
4 new spillway; is that correct?

5 A. That's correct.

6 Q. Is it fair to say if the 15 -- and you
7 have determined -- your opinion is that the
8 July, 2003 event was a 240-year event; is that
9 correct?

10 A. 240-year rainfall.

11 Q. Rainfall event, that's fine. I was
12 going to get to that.

13 A rainfall event and a flood event are
14 not the same; is that correct?

15 A. Correct.

16 Q. Did you do any comparison as to the
17 acres flooded with the new spillway in place for
18 the July, 2003 event versus the -- if the old
19 spillway were in place?

20 A. No.

21 Q. You weren't asked to do that?

22 A. No.

23 Q. Is it fair to say that if the
24 hundred-year flood event caused increased

1 acreage, that a 240-year rain event would have
2 caused increased acreage flooded by the new
3 spillway?

4 A. Yes. If you compared the July, 2003
5 event with the old spillway in place, it is
6 likely there would have been less acreage
7 flooded near the dam.

8 Q. Okay. Could I see your binder for one
9 more minute?

10 A. Which one?

11 Q. The technical one with the Table 2.5. I
12 just have a couple questions on 2.5, and I'd
13 rather use the updated one.

14 I'm going to ask you this question and
15 then I'll give it back. Would you agree with me
16 that your Table 2.5 shows that the 96-hour,
17 five-year event with the new spillway has a
18 higher peak spillway flow than the 96-hour,
19 hundred-year event with the old spillway in
20 place?

21 A. Can you repeat the question, please?

22 Q. Sure. Would you agree that the 96-hour,
23 five-year event with the new spillway has a
24 higher peak spillway flow than the 96-hour,

1 hundred-year event with the old spillway in
2 place?

3 A. Agree.

4 Q. would you similarly agree that the
5 24-hour, 15-year event with the new spillway in
6 place has a higher peak spillway flow than the
7 96-hour, hundred-year event with the old
8 spillway in place?

9 A. Agreed.

10 Q. would you also agree that the 24-hour,
11 15-year event with the new spillway in place has
12 a higher peak spillway flow than the 24-hour,
13 hundred-year event with the old spillway in
14 place?

15 A. Agreed.

16 Q. Are you familiar with Manning's N value?

17 A. Yes.

18 Q. Is that a -- what is Manning's N value?

19 A. That is a roughness factor that is used
20 in hydraulic modeling.

21 Q. Does the value used, is it impacted by
22 how much or how little vegetation is within the
23 channel or on its banks?

24 A. Yes.

1 Q. Is the value used impacted by whether
2 the waterway is channelized or not?

3 A. Yes.

4 Q. Am I right that you used -- that
5 Stantec, for its HEC-RAS model here, used a
6 Manning's N value of .045 for the Beaver Creek?

7 A. That's correct.

8 Q. As part of the HEC-RAS modeling, did you
9 do cross section work or analysis?

10 A. Yes. Cross sections are part of the
11 hydraulic model.

12 Q. Did Stantec add any levies or
13 restrictions that are not actually physically
14 present at those cross sections?

15 A. Not that I'm aware of.

16 Q. So you're not aware of any levies that
17 were added that don't necessarily exist at that
18 cross section?

19 A. Can you clarify what you mean by levy?

20 Q. Or within the flow for that cross
21 section, any levies or other types of
22 restrictions on the flow that were added that
23 don't actually exist at that cross section?

24 A. The cross sections are cut from

1 topographic data, so if there's a levy, or what
 2 I think you're calling a levy, or a berm next to
 3 the creek, that would show up on topographic
 4 data. Sometimes it is appropriate to add
 5 ineffective flows, or there's an option in
 6 HEC-RAS called levy to properly model what is
 7 happening.

8 Q. Do you know for the HEC-RAS modeling
 9 that was done for this report, if that option
 10 levy was selected?

11 A. I don't recall right now.

12 Q. Did you yourself do the HEC-RAS
 13 modeling, or did you have someone else at
 14 Stantec do the HEC-RAS modeling?

15 A. I did the majority of the HEC-RAS
 16 modeling and oversaw it. There were people that
 17 assisted.

18 Q. Who else assisted? Who assisted you?

19 A. Anil Tangirala.

20 Q. You have to spell that for us.

21 A. A-n-i-l T-a-n-g-i-r-a-l-a.

22 Q. Anyone else that assisted you?

23 A. Melissa Williams.

24 Q. Anyone else?

1 A. They were the two people that assisted
2 the most on the project.

3 Q. Would you agree that adding restrictions
4 to the flow can impact the timing of that flow
5 through a waterway?

6 A. Can you clarify?

7 Q. Sure. If you have one waterway that has
8 a lot of bridges and another waterway that
9 doesn't have any bridges, are the bridges going
10 to impact the timing of the flow going through
11 that waterway?

12 A. Yes, potentially.

13 Q. And so would berms or levies,
14 potentially?

15 A. Potentially.

16 Q. Okay. The HEC-RAS model that Stantec
17 used, it didn't include any cross sections for
18 the tributaries along the Beaver Creek; is that
19 correct?

20 A. Correct. No tributaries were involved.

21 Q. So you didn't -- the HEC-RAS model that
22 Stantec used did not consider the backwater
23 flooding of those tributaries from the Beaver
24 Creek?

1 A. There was no hydraulic model developed
2 for the tributaries. Using the model of the
3 Beaver Creek where each tributary comes in, you
4 could see what the maximum backwater elevation
5 is.

6 Q. But you didn't do any cross sections of
7 the tributaries?

8 A. There were no hydraulic models developed
9 for tributaries.

10 Q. Okay. And there were no cross sections
11 for the Wabash River upstream of the confluence
12 with the Beaver Creek; is that correct?

13 A. Not in the hydraulic model.

14 Q. Would you agree with me that the cross
15 sections used in Stantec's HEC-RAS model were
16 primarily at the bridges?

17 A. There are four cross -- each bridge,
18 there are four cross sections, and then there
19 are cross sections in between each structure.

20 Q. Would you agree that the majority of the
21 cross sections that Stantec used were at the
22 bridges?

23 A. I'd have to count them to see if it's
24 majority, but by the nature of the way hydraulic

1 modeling is done, the more sections at a bridge,
2 less sections in between bridges.

3 Q. Am I correct that there were no cross
4 sections done at overbank areas which may
5 have -- may become significant channels at
6 higher flood elevations?

7 MS. WORLY: Objection; compound
8 question.

9 Can you break that down? You're making
10 assumption that they may have been.

11 MR. FUSONIE: well, I'm asking if there
12 were any -- okay.

13 Q. Were there any cross sections done in
14 overbank areas?

15 A. Cross sections extended into the
16 overbanks.

17 Q. Okay. Did Stantec identify any overbank
18 areas that could become significant channels
19 during a floods event?

20 A. I think you're asking about split flow.
21 And, no, split flow was not used on this
22 project.

23 Q. Okay. Have you done -- you've done a
24 visual inspection of the Beaver Creek; is that

1 correct?

2 A. Yes.

3 Q. Would you agree with me that there are
4 no continuous levies along the Beaver Creek?

5 A. I haven't walked the entire reach.
6 There are agricultural berms, but it's probably
7 a fair characterization to say there's no
8 structural levies.

9 --0--

10 (Relators' Exhibit I marked.)

11 --0--

12 MR. FUSONIE: I'm going to mark his
13 revised report as Exhibit I. Do you have any
14 problem with me keeping this exhibit versus
15 providing it to the court reporter as the
16 exhibit?

17 MS. WORLY: We have sufficient numbers.
18 We're fine.

19 MR. FUSONIE: Oh, all right. Perfect.
20 Thank you.

21 BY MR. FUSONIE:

22 Q. Mr. Henson, could you, for purposes of
23 the record, tell me what I have marked as
24 Exhibit I.

1 A. Yes. This is a CD titled, Grand Lake
2 St. Mary's hydrologic and hydraulic model,
3 revised April 29th, 2010, Report 1, technical
4 background.

5 Q. Okay.

6 --0--

7 (Relators' Exhibit J marked.)

8 --0--

9 MR. FUSONIE: Do you have enough copies
10 of this, too?

11 MS. WORLY: I do.

12 MR. FUSONIE: Thank you.

13 BY MR. FUSONIE:

14 Q. Mr. Henson, I'm going to show you what
15 I've marked as Exhibit J. would you identify
16 this record for me, this document.

17 A. Yes. This is titled recorded pool
18 levels -- well, this is a document that I
19 brought today that contains -- there's not
20 really a title on it. It contains historic pool
21 level information.

22 Q. Where did you obtain this information?

23 A. This is the same data that was the -- an
24 appendix in one of CRA's reports.

1 Q. Okay. Am I right in reading this that
2 the average pool level is higher post spillway
3 modification?

4 A. Correct. What you're looking at is for
5 the nonmanaged months, so I took out all of the
6 data from March -- let me see -- all of the data
7 from April -- no.

8 I took out all of the data from when
9 they previously managed the lake levels, which
10 I -- if I recall --

11 Q. Looks like it's November through March.

12 A. November through March, correct.

13 And determined, based on that, an
14 average pool level.

15 Q. And the average pool level for
16 prespillway modification is 870.72 NGVD?

17 A. That is correct.

18 Q. And the average pool level for the
19 postspillway modification is 870.96 NGVD?

20 A. That is correct.

21 Q. Okay.

22 A. The reason why I believe this is
23 significant is that I think everybody agrees the
24 new spillway allows more flow out of the lake.

1 Q. Correct.

2 A. So even though we're looking at
3 nonmanaged months here, and we're -- the new
4 spillway lets more flow out of the lake, we
5 still see a higher average pool level, which, to
6 me, can only mean there has been more rainfall
7 and runoff into the lake and more rainfall and
8 runoff, therefore, downstream of the lake.

9 Q. More rainfall and runoff into the lake
10 causes more discharge from the spillway,
11 correct?

12 A. Correct.

13 --0--

14 (Relators' Exhibit K marked.)

15 --0--

16 BY MR. FUSONIE:

17 Q. Mr. Henson, I'm going to show you what
18 I've marked as Exhibit K. Could you identify
19 Exhibit K for me?

20 A. This is titled "Analysis of Rainfall
21 Data from Celina gage." And this is a summary
22 of the rainfall data recorded at a NEO gage. It
23 was Cooperative Station Number 33-1390. And we
24 did an analysis on the rainfall prior to the new

1 spillway being conducted and -- being
2 constructed and after the new spillway was
3 constructed. And that showed that since the new
4 spillway was constructed, there's a higher
5 average annual rainfall at that gage. And in
6 addition to that, the number of light rainfall
7 days has decreased by 14 percent. And here
8 we're defining light rainfall days as less than
9 half an inch of precipitation in a 24-hour
10 period.

11 Q. All right.

12 A. And the number -- so it would make sense
13 that if the number of light rainfall days
14 decreases, the rainfall -- and the average
15 annual precipitation increases, that means there
16 are more intense rainfalls since '97 than we've
17 seen prior to '97.

18 Q. Well, let's break this down.

19 Your data for 1998 to 2007 excludes a
20 whole year of 2004, correct?

21 A. Correct.

22 Q. So you've actually used less than 10
23 years, correct?

24 A. Correct.

1 Q. Which is something that you criticize
2 Dr. Campbell for, correct, for using less than
3 10 years of statistical data?

4 A. Of lake level data.

5 Q. How is the statistical credibility any
6 different? It's not.

7 A. In analysis of the rain gage.

8 Q. Do you have any knowledge as to the
9 rainfall in 2004 at that gage?

10 A. The information was excluded because the
11 data for that year was incomplete.

12 Q. So am I correct, if you have a --
13 everyone agrees that there was a significant
14 rain event in July of 2003, correct?

15 A. Correct.

16 Q. And if you include that rain event in
17 nine years of data versus 10 years of data,
18 that's going to have a greater weight, correct?

19 A. Correct.

20 Q. Okay. And if there was also a rainfall
21 event -- significant rainfall event in January
22 of 2005, and you include that in nine years of
23 data versus 10 years of data, it is going to
24 have greater weight to the nine years of data,

1 correct?

2 A. Correct.

3 Q. Okay.

4 A. On the average annual precipitation.

5 When you're looking at the number of light
6 rainfall days versus medium rainfall days versus
7 severe rainfall days, you have a much, much
8 larger sample because you're talking about 365
9 days in a year for that many years. So that
10 data is what I believe is significant on this
11 exhibit.

12 Q. Your average number of severe rainfall
13 days for 1985 to 1996 is seven, correct?

14 A. Of severe rainfall days, correct.

15 Q. Your average number of severe rainfall
16 days for 1998 to 2007, excluding a full year, is
17 nine, correct?

18 A. For severe rainfall days, correct.

19 Q. We have no idea how many severe rainfall
20 days there were in 2004 at that gage, do we,
21 based on what you have here in this exhibit?

22 A. The data was incomplete for 2004.

23 Q. Okay. Do you have any reason to believe
24 that the average number of rainfall days at this

1 gage is any different than the rainfall on the
2 Grand Lake, statistically?

3 MS. WORLY: Objection; vague.

4 Do you understand his question?

5 A. Could you please rephrase?

6 Q. I believe you're trying to use this
7 average rainfall at this gage to show how much
8 rain is running off into the Grand Lake; is that
9 correct?

10 A. No.

11 Q. There's an -- well, that there's an
12 increase in the average number of rainfall days
13 at this gage, correct?

14 A. Repeat that again.

15 Q. Sure. This document is to try to show
16 that there is an increase in the average number
17 of rainfall days at this gage.

18 MS. WORLY: Objection. Why don't you
19 just ask him what he believes it shows?

20 MR. FUSONIE: I'm asking my question.

21 A. Could you please restate it again?

22 Q. Sure. You have here rainfall days -- an
23 average number of rainfall days.

24 Let me start with this. You have an

1 average annual precipitation for 1985 to 1996,
2 correct?

3 A. Correct.

4 Q. And you have one for 1998 to 2007,
5 correct?

6 A. Correct.

7 Q. And this is from the Celina 3 NE Ohio
8 gage, correct?

9 A. Correct.

10 Q. And why did you select that gage versus
11 any other gage?

12 A. That was the nearest to the watershed.

13 Q. To the Grand Lake St. Mary's --

14 A. Grand Lake, St. Mary's, Beaver Creek,
15 Wabash River watershed.

16 Q. Okay. Which includes the lake itself,
17 correct?

18 A. It is the nearest gage to that
19 watershed, yes.

20 Q. The watershed includes the lake?

21 A. Includes the lake, yes.

22 Q. All right.

23 --0--

24 (Relators' Exhibit L marked.)

1

--0--

2 BY MR. FUSONIE:

3 Q. Would you identify Exhibit L for me.

4 A. Yes. It's titled "Impacts to Peak
5 Flooding for Old Spillway at Winter Pool for
6 100-year Flood Event."7 Q. And this is a -- did you prepare this
8 map?

9 A. It was prepared under my direction.

10 Q. When was it prepared?

11 A. It was prepared yesterday.

12 Q. Yesterday?

13 And was there a similar map showing
14 impacts to peak flooding for the new spillway at
15 winter pool for the hundred-year flood event?16 A. No. What this map shows is -- the
17 yellow is a 100-year flood event through the new
18 spillway. The blue is a 100-year flood event
19 through the old spillway, but with the lake
20 level beginning 12 inches below the old spillway
21 crest. So if the old spillway -- if the pool
22 level were drawn down, as it was previous to the
23 construction of the new spillway, and there was
24 a 100-year rainfall, that's what the blue

1 represents.

2 Q. okay.

3 MS. WORLY: Off the record for just a
4 second.

5 (Discussion held off the record.)

6 Q. If you look at the impacts due to peak
7 flooding for the 100-year flood event and
8 compare it to Exhibit L, if you look at Parcel
9 Number 64, would you agree with me that for
10 Exhibit L, it shows it flooded? It shows
11 yellow, and for the 100-year flood event, it
12 doesn't show it yellow?

13 MS. WORLY: What are we comparing to?

14 MR. FUSONIE: Here it's yellow
15 (indicating). And by "here," I mean Exhibit L.

16 MS. WORLY: Which map are you comparing
17 to?

18 MR. FUSONIE: Impacts of peak flooding
19 due to spillway improvement for the 100-year
20 flood event.

21 (Pause in proceedings.)

22 A. Uh-huh.

23 Q. There's no flooding on the -- in the
24 impacts of peak flooding due to spillway

1 improvement for the 100-year flood event,
2 correct?

3 MS. WORLY: Objection. I believe what
4 you want to say is there's no yellow in one
5 parcel -- on one map as opposed to the other.

6 MR. FUSONIE: Well, actually he's
7 showing on Exhibit --

8 Q. On the impacts to peak flooding due to
9 spillway improvements for the 100-year flood
10 event, Mr. Henson, you're showing no flood
11 event, correct?

12 A. Correct.

13 Q. And for the Exhibit L, for 64, you have
14 flooding, correct?

15 A. Correct.

16 Q. And for Parcel 82, let's start with
17 Exhibit L, you show flooding, correct?

18 A. Correct.

19 Q. And for the impacts to peak flooding due
20 to spillway improvements for 100-year flood
21 event, you don't show any flooding, correct?

22 A. Correct. I think it's important to
23 point out that while the mapping is a tool to
24 look at the results of the hydraulic modeling,

1 the modeling itself contains the information
2 that is -- you know, that should be used to
3 determine impacts to parcels.

4 Q. Okay. I'm --

5 A. In other words, when you map the results
6 of a hydraulic model, you're comparing the
7 computer water surface elevation to the ground
8 surface. Right?

9 Q. Right.

10 A. The results of that when it's done using
11 the computer, there's lots of manual cleanup and
12 fixes after you get the results out of the
13 computer that need to be done. So it -- the
14 mapping --

15 Q. There's a lot of quality assurance
16 you've got to do with HEC-RAS, as well, though,
17 isn't there?

18 MS. WORLY: Let him finish his answer.

19 MR. FUSONIE: Sorry.

20 A. So the mapping is a tool to help
21 visualize the results of the model.

22 Q. Okay. There's a lot of quality
23 assurance that has to be done with the HEC-RAS
24 model, correct?

1 A. Correct.

2 Q. And same with the HEC-HMS model?

3 A. Correct.

4 Q. And this map, that is, the impacts to

5 peak flooding due to the spillway improvements

6 for a hundred-year flood event, was attached to

7 an affidavit under oath, correct?

8 A. Correct.

9 Q. And you have just testified under oath

10 about this -- about Exhibit L, which you

11 provided to us today, correct?

12 A. Correct.

13 Q. And that map says impacts to peak

14 flooding for old spillway at winter pool for a

15 hundred-year flood event, correct?

16 A. Correct.

17 Q. And you've explained to me under oath

18 that the yellow indicates areas of flooding

19 caused by the new spillway versus the old

20 spillway, correct?

21 A. The yellow is a general visualization of

22 the model results.

23 Q. So the yellow is the areas that -- where

24 the new spillway has caused flooding that the

1 old spillway did not cause, correct?

2 A. That is the intent of -- for the map, to
3 visualize that.

4 Q. Okay.

5 A. To get the actual difference in
6 elevations, you would go to the model itself.

7 Q. The map represents, in yellow, areas
8 that have been flooded by the new spillway that
9 were not flooded under the old spillway,
10 correct?

11 A. Correct. That's the --

12 Q. That's what it shows?

13 A. That's the results of the hydraulic
14 model, mapped using a computer, yes.

15 MS. WORLY: Are you finished with these
16 maps for now?

17 MR. FUSONIE: I am, thank you.

18 MS. WORLY: Should we fold them back up?

19 MR. FUSONIE: That's fine with me.

20 (Pause in proceedings.)

21 BY MR. FUSONIE:

22 Q. The normal pool elevation with the new
23 spillway, am I correct it's 870.6?

24 A. That is the elevation in NGVD.

1 Q. NGVD?

2 A. Correct, that's my understanding.

3 Q. And the spill -- the old spillway, at
4 least until 1988, the normal pool elevation was
5 870.27. Does that sound correct?

6 A. I don't know. I don't recall having
7 seen that.

8 Q. Do you recall that the -- around 1988,
9 there were stoplogs put in place to raise the
10 elevation of the lake?

11 A. Yes.

12 Q. And do you recall that the elevation of
13 the normal pool was raised to 870.6 NGVD?

14 A. Correct.

15 Q. And the normal pool elevation, do you
16 recall, was raised, I think it was somewhere
17 between 3 and 4 inches? Does that sound correct
18 to you?

19 A. 4 inches sounds correct.

20 Q. So if we take out 4 inches from 870.6,
21 the normal pool elevation between 1988 was
22 870.2. Does that sound correct?

23 A. Correct.

24 Q. Okay. Do you recall that Dr. Campbell

1 reported that since -- between 1997 and 2006,
2 the -- 73 percent of the daily measurements
3 collected at the lake reflected elevations at
4 870.6 or above?

5 A. I don't recall the exact percentages in
6 numbers, but I think it is in a report.

7 Q. If you can look at 3.1.

8 A. Okay.

9 Q. The last paragraph. It actually says,
10 he reported that since 1997, 70 -- did you mean
11 where it says 73 percent of daily measurements
12 collected reflect lake elevations above 871.5,
13 did you mean 870.6?

14 A. If that was what was in his affidavit.
15 we would have to check his affidavit.

16 Q. But you see that the next thing you say
17 is, 26 percent reflect lake elevations above
18 871.5. So one of them's got to be incorrect,
19 right?

20 A. We could check Campbell's affidavit to
21 see.

22 Q. I think if we can help refresh your
23 recollection, on the next page, it says,
24 "Stantec's analysis shows that from 1989 to

1 1997, 66 percent of measurements taken reflect
2 lake elevations above 870.6."

3 Does that help refresh your recollection
4 that the 73 percent that you refer to is
5 connected to the 870.6?

6 A. That sounds correct.

7 Q. And you would agree with me that there
8 is a higher percentage of measurements between
9 1997 and 2006 versus 1989 and 1997 that's above
10 870.6?

11 A. Could you please repeat that?

12 Q. Sure. You would agree with me that for
13 the period of 1997 to 2006, there is a higher
14 percent of daily measurements collected that
15 reflect lake elevations above 870.6 than between
16 1989 to 1997?

17 MS. WORLY: Objection.

18 If you can tell that from this
19 statement.

20 A. I'm sorry. Can you repeat it one more
21 time?

22 Q. Let me try it this way. Dr. Campbell,
23 as you report in 3.1, report -- Dr. Campbell
24 said that since 1997, 73 percent of daily

1 measurements collected reflect lake elevations
2 above 870.6. You don't dispute the math there,
3 do you?

4 A. I don't know that I checked it, but...

5 Q. So you have no reason to --

6 A. I have no reason -- I did not dispute
7 it -- I mean, I did not check it.

8 Q. Okay. So you have no reason to doubt it
9 because you didn't check it?

10 MS. WORLY: Objection.

11 I think he said he doesn't know.

12 MR. FUSONIE: He doesn't know, okay.

13 Q. So assuming it's accurate for purposes
14 of my question, it's 73 percent between 1997 and
15 2006, and assuming Stantec's calculation is
16 accurate for 1989 and 1997, that's 66 percent of
17 the measurements, correct?

18 A. Correct.

19 Q. So 73 percent is higher than 66 percent,
20 correct?

21 A. Correct.

22 Q. Similarly, if Dr. Campbell's math is
23 correct, between 1997 and 2006, 26 percent of
24 the daily measurements reflect lake elevations

1 above 871.5, and if Stantec's measurements are
2 correct, 19 percent of the measurements between
3 1989 to 1997 were at or above 871.5, correct?

4 A. Correct.

5 Q. And the simple math is that 26 percent
6 is higher than 19 percent.

7 A. That is correct.

8 Q. Okay. Were you aware that when
9 Dr. Campbell prepared his Case Leasing reports,
10 that he was using the hydrology and hydraulic
11 modeling provided by ODNR?

12 A. Yes.

13 Q. Okay. I'm going to show you what's been
14 previously marked as Exhibit D, and
15 specifically, I'm going to show you Table 1 from
16 Exhibit D, which is model results for historical
17 storm events, Grand Lake St. Mary's, Mercer and
18 Auglaize Counties, Ohio.

19 A. Uh-huh.

20 Q. Do you recall seeing this table before?

21 A. Yes.

22 Q. Do you see that there's a 39.4-foot
23 spillway column?

24 A. Yes.

1 Q. For maximum lake elevation?

2 A. Yes.

3 Q. And there's a similar column for the
4 500-foot spillway maximum lake elevation?

5 A. Yes.

6 Q. Would you agree with me that for each
7 rainfall runoff event, that the maximum lake
8 elevation is higher for the 39.4-foot spillway
9 than the 500-foot spillway?

10 A. Yes.

11 Q. And is that consistent with your study
12 of the maximum lake elevations for the 39.4 and
13 the 500, that the 39.4 had a slightly larger
14 storage capacity, or retention?

15 A. I'm not sure you stated that correctly,
16 but I think what you are trying to say is that
17 for a given event, the lake elevation for --
18 through the -- as a result of the 39.4-foot
19 spillway being in place would be higher than
20 with the 500-foot spillway in place.

21 Q. Okay. And that was -- that's consistent
22 with your work in this case, correct?

23 A. Correct.

24 Q. In your 3.0 discussion, the second

1 paragraph, last sentence -- well, strike that.

2 MR. FUSONIE: Just give me five minutes
3 to -- I'm -- I just need five minutes to make
4 sure I haven't missed anything.

5 MS. WORLY: That's fine.

6 (Recess taken.)

7 BY MR. FUSONIE:

8 Q. Mr. Henson, have you ever done any study
9 of the flooding pre 1997 along the south side of
10 Grand Lake St. Mary's?

11 A. You talking about along the lake shore?

12 Q. Correct.

13 A. We've calculated lake elevations for
14 various storm events pre and post spillway.

15 Q. Are there areas that you recall to the
16 south side of the lake that have now decreased
17 flooding because of the new spillway?

18 A. Yes.

19 Q. And -- okay. What conversations have
20 you -- are you familiar with Philip De Groot?

21 A. Yes.

22 Q. What conversations have you had with
23 Dr. De Groot about this lawsuit or any of your
24 work in this lawsuit?

1 A. He attended a meeting at our office. I
2 don't remember the exact date.

3 Q. Do you remember what month?

4 A. I really do not remember the month. I
5 believe it was this year.

6 Q. Was it before you signed your affidavit?

7 A. Yes.

8 Q. Was it before you finalized your
9 hydrology and hydraulic reports that you
10 attached to your March 1st affidavit?

11 A. Yes.

12 Q. Who else was present at that meeting?

13 A. There were several Assistant Attorney
14 Generals. We've had, I believe, both Mindy
15 Worly, Bill Cole. I do not recall if Jenny
16 Croskey was at that one. Myself, Jay Dorsey.
17 Phil De Groot. I don't recall if Dave Moore
18 attended that one.

19 Q. Can you tell me what was discussed
20 during that meeting.

21 MS. WORLY: Objection. To the extent
22 that you're asking him to recall information or
23 conversations or discussions that would be
24 protected by attorney work product, I would

1 instruct him not to answer.

2 Q. What did Dr. De Groot tell you?

3 A. We generally discussed the work that
4 we've been working on. We looked at some
5 mapping.

6 Q. What mapping did you look at?

7 A. I believe it was the mapping that was
8 included in the report.

9 Q. Were any of the maps included in the
10 report modified based on discussions with Dr. De
11 Groot?

12 A. I don't recall any discussions with him
13 that directly modified those maps.

14 Q. Did he make any suggestions about the
15 modeling used in your report?

16 A. He did provide some information. Not at
17 that meeting.

18 Q. He provided information to you at
19 another meeting?

20 A. No.

21 Q. By e-mail?

22 A. Yes.

23 Q. What information did he provide you by
24 e-mail?

1 A. I believe it was some information about
2 the modeling that we had done.

3 Q. Do you have a copy of that e-mail?

4 A. Not with me.

5 Q. But you have it at your office at
6 Stantec?

7 A. Yes.

8 MR. FUSONIE: I'd request that I get a
9 copy of that e-mail. I'll include that as part
10 of my e-mail summary.

11 Q. Do you recall any other documents he
12 provided you?

13 A. Not that he provided me.

14 Q. Did you provide him with any documents?

15 A. I forwarded him some affidavits of some
16 of the respondents (sic) that talked about the
17 March flood event.

18 Q. March of this year?

19 A. Yes.

20 MR. FUSONIE: I'd ask for a copy of that
21 e-mail.

22 Q. Why did you forward him a copy of those
23 affidavits?

24 A. I thought it might be useful to him.

1 Q. Did you obtain those from the Attorney
2 General's office?

3 A. Yes.

4 MR. COLE: I think he meant to say
5 relators rather than respondents.

6 MR. FUSONIE: Yeah.

7 Q. Have you -- do you recall any photos or
8 videos attached to those affidavits?

9 A. Yes.

10 Q. Have you reviewed any of those photos or
11 videos?

12 A. Not all of them, but some of them, yes.

13 Q. Okay. Mr. Henson, I'm going to show you
14 what's been previously marked as Exhibit E. I
15 know that this is a document you saw during
16 Dr. Campbell's deposition yesterday, but prior
17 to that, did you -- had you seen this document?

18 A. Yes, I've seen this or some version of
19 this.

20 Q. Did you help prepare this document?

21 A. No.

22 Q. Do you have an understanding as to why
23 it was prepared?

24 A. I believe the intention was to show the

1 location of parcels in this current lawsuit.

2 Q. Does it also show parcels that were
3 involved in that prior lawsuit regarding the
4 spillway?

5 A. Yes, it does.

6 MR. FUSONIE: I don't have any further
7 questions. I may have some followup.

8 MS. WORLY: Okay. I have some followup.

9 EXAMINATION

10 BY MS. WORLY:

11 Q. Mr. Henson, we've talked a lot about
12 mapping today. And you brought a supplement,
13 which I believe has been labeled as Exhibit L.
14 And Mr. Fusonie asked you some questions about
15 Exhibit L, specifically about some yellow
16 squares that appear in Exhibit L that were not
17 on a previous exhibit attached to your
18 affidavit. Can you explain the difference, why
19 there appears to be a difference.

20 MR. FUSONIE: Objection. Maps speak for
21 themselves.

22 Q. You can answer.

23 A. As I said before, the hydraulic model is
24 what you need to look at to determine impacts of

1 flooding on a parcel. The mapping that has been
2 prepared is a tool that can be used to assist in
3 that. There's lots of manual cleanup effort
4 that goes into producing the maps.

5 Q. And so why would one map contain more
6 yellow squares or grids or whatever than
7 another?

8 A. When --

9 MR. FUSONIE: Objection.

10 Q. You can answer.

11 MR. FUSONIE: Speculation.

12 A. When the mapper was preparing it, when
13 you compare the water surface elevation to the
14 ground elevation, a lot of times you end up with
15 little puddles that are connected by thin -- or
16 not connected at all -- by very thin lines, and
17 a determination has to be made if flooding could
18 reach that area or not. It appears in this
19 case, even though the elevations from the model
20 were the same, a different decision was made by
21 the mapper on whether to include that as flooded
22 area or not.

23 Q. You testified earlier that
24 one-quarter-inch change for peak flood elevation

1 is insignificant. What was the basis of that
2 testimony?

3 A. Well, the topographic information has a
4 certain accuracy, and in FEMA mapping standards,
5 a quarter of an inch -- you would not redraw a
6 flood map for a quarter of an inch elevation
7 difference.

8 Q. Why not?

9 A. Because it would not show up at any map
10 scale.

11 Q. In response to an earlier question, you
12 stated that you had not used a HEC-RAS unsteady
13 flow model to generate a flood study map for
14 FEMA. Have you used the unsteady flow modeling
15 option in HEC-RAS for other studies?

16 A. Yes, for many studies, many -- where it
17 is appropriate to use unsteady flow, such as dam
18 break studies, other flood studies where -- for
19 other clients where -- it's not necessarily for
20 FEMA, but where an unsteady flow model is
21 appropriate.

22 Q. Can you give me a couple of examples of
23 when you used unsteady flow model.

24 A. Sure. We've done some modeling for TVA,

1 the Tennessee Valley Authority, in both Kentucky
2 and Tennessee, where unsteady flow modeling were
3 used. Numerous dam break studies where you're
4 looking at downstream impacts from a dam that
5 fails, where we've used unsteady flow modeling.

6 Q. And all of that's since 2001?

7 A. Yes.

8 Q. Are you familiar with the Linn Grove
9 stream gage?

10 A. Yes.

11 Q. Where is that located?

12 A. That is about 20 miles down the Wabash
13 River in Indiana.

14 Q. Were you aware of this gage when you
15 were building your hydrologic and hydraulic
16 model?

17 A. Yes.

18 Q. Why didn't you use this gage, the Linn
19 Grove gage data, to calibrate your models?

20 A. Because the drainage area -- if you look
21 at the USGS web site, I think it reports the
22 drainage area at that gage is -- I don't know if
23 I recall the exact number, on the order of 450
24 square miles, but if you look at the actual

1 drainage area to that gage -- because Grand Lake
2 St. Mary's lies on a drainage divide when the
3 USGS was calculating the drainage area to the
4 Linn Grove gage, it appears that they took it
5 right through the middle of Grand Lake
6 St. Mary's, which is not appropriate. So the
7 actual drainage area at that Linn Grove gage is
8 on the order of 520 square miles. The area --
9 the drainage area of our study at the state line
10 is on the order of, I think, 300 square miles,
11 so that's a significant difference -- I don't
12 know what the -- not quite double, but almost
13 double the drainage area at the Linn Grove gage,
14 which is beyond the limits to where standard
15 engineering practice would have you use that as
16 a -- to calibrate a model.

17 In addition, because we're using
18 unsteady flow in this instance, there was no
19 hydrologic routing of Beaver Creek and Wabash
20 River in the study reach. It was done on the
21 unsteady flow model. So in order to calibrate
22 at that gage 20 miles into Indiana, we would
23 have to extend the hydraulic model 20 miles into
24 Indiana, and I don't believe we had good enough

1 topographic data in Indiana to do that.

2 Q. Is a drainage area the same thing as a
3 watershed?

4 A. Yes.

5 Q. Now, did you calibrate your model?

6 MR. FUSONIE: Objection; vague.

7 Q. You can answer.

8 A. Yes. There was very good information
9 available from the July, 2003 storm event, both
10 in lake elevation data and high watermarks, that
11 were surveyed by the Mercer County engineer that
12 were used to verify and calibrate the hydrology
13 and hydraulic models. Very closely.

14 Q. And what was the watershed or the
15 drainage area that was used for the calibration
16 purposes?

17 A. Well, I'm not sure that there -- there
18 were high watermarks, so instead of a -- there
19 was no drainage area used. The high watermarks
20 in the pool level and the verification to stream
21 flow, to a regression equation, was used to
22 calibrate.

23 Q. And that information came from where?

24 A. The high watermark elevation came from

1 the Mercer County engineers. The lake level
2 elevation came from ODNR records. The
3 regression equation was calculated from the
4 literature of engineering practice.

5 Q. Earlier today, you were also asked a
6 couple of questions about which method you used
7 to establish the time of concentration for your
8 watersheds in the HEC-HMS model. Can you
9 briefly describe your approach for estimating
10 the time of concentration.

11 MR. FUSONIE: Objection as to form.

12 A. Yes. The TR-55 method was used, which,
13 as we discussed earlier, has a sheet flow,
14 shallow concentrated flow, and channel flow
15 component, verified in appendix -- Plate 9 of
16 Appendix A of the Grand Lake St. Mary's and
17 Beaver Creek hydrologic and hydraulic analysis
18 technical report that 100 feet was used as the
19 sheet flow length.

20 Q. Why is there a length limit on the sheet
21 flow portion of the flow path?

22 A. Because after a certain point, water
23 stops flowing over land and concentrates into a
24 shallow channel or more concentrated flow.

1 Q. Where does that guidance come from?

2 A. From TR-55, Technical Release 55, which
3 was produced by the Natural Resources
4 Conservation Services, formerly SCS.

5 Q. Now, earlier you talked about the
6 tributaries and how they were accounted for in
7 your hydraulic models. Can you tell us how that
8 was done.

9 MR. FUSONIE: Objection;
10 mischaracterization.

11 A. As I testified earlier, we did not --
12 there were no hydraulic models produced for any
13 of the tributaries, but given the -- the
14 backwater was mapped of each of the tributaries
15 based on the peak elevation in Beaver Creek or
16 Wabash River. And because the tributaries have
17 a much smaller drainage area than the Beaver
18 Creek and Wabash River themselves, the flow --
19 the local inflow from those tributaries would
20 have entered Beaver Creek before Beaver Creek
21 was at its peak elevation, which is why we can
22 say that properties along those tributaries are
23 not impacted by flow from the new spillway --
24 additional flow from the new spillway.

1 Q. I'd like to draw your attention to Table
2 4. And we talked about it earlier and I have a
3 couple questions about Table 4. And I wanted
4 you to tell me how you identified parcels for
5 inclusion in Table 4.

6 A. Sure.

7 MR. FUSONIE: Objection. Table 4 speaks
8 for itself.

9 A. In the executive summary introduction
10 and executive summary section of the report,
11 under Numbers 4 and 5, I describe how, for the
12 15-year, 96-hour event downstream of Fleetwood
13 Road, the increase in depth due to additional
14 spillway is small enough that no noticeable
15 additional area is inundated. And likewise,
16 under Number 5 in the executive summary, noted
17 that for a hundred-year event, downstream of
18 State Route 29, no -- the increase in flooding
19 was small enough to cause no noticeable area to
20 be inundated. And so Table 4 and Table 1 only
21 included those parcels upstream of those roads.

22 Q. And what do you mean when you say "no
23 noticeable"? What does "noticeable" mean in
24 your report?

1 A. It means that when you are -- a very
2 small area might be inundated, but when you're
3 looking at map scale, it might be almost
4 impossible to see unless you zoom way in, or --
5 that's what I mean by noticeable.

6 MS. WORLY: I don't think we have
7 anything else.

8 MR. FUSONIE: I have a few followup.

9 FURTHER EXAMINATION

10 BY MR. FUSONIE:

11 Q. We talked earlier about your hundred
12 year -- I call it the map that shows the impact
13 of the new spillway for the hundred-year event,
14 and there were areas on that map that were in
15 yellow that were west of Fleetwood Road,
16 correct?

17 A. Correct. Or US 29.

18 Q. US 29, sorry. US 29.

19 And if one of those areas of yellow on
20 the parcel was one acre, are you saying that
21 that's not noticeable?

22 A. I'm saying that the increase in flood
23 elevation for those at those areas is very
24 small.

1 Q. If it was one acre and you were the
2 owner, you would consider that small?

3 MS. WORLY: Objection; hypothetical.
4 Do you want to show him a specific
5 parcel?

6 Q. Well, Table 7 -- you included in Table 7
7 for some of these parcels' acres impacted. For
8 example, Carmen and Jill Ellis for the
9 hundred-year event, .8 acres impacted.

10 A. I see that.

11 Q. Okay. So you would agree with me that
12 .8 acres is a noticeable impact?

13 A. It depends on the definition of
14 noticeable.

15 Q. Well, as you used it to create Table 7,
16 you included Carmen and Jill Ellis, .8 acres
17 impacted, so for purposes of Table 7, .8 acres
18 is noticeable, correct?

19 A. I believe that was included because it
20 was upstream of State Route 29.

21 Q. Well, your testimony was that there was
22 no noticeable flooding west of US 29. And I'm
23 trying to find out what you mean by "no
24 noticeable," when east of US 29, you've

1 identified a parcel of .8 acres impacted. So if
2 there was a parcel west of US 29 that had .8
3 acres impacted by the new spillway for the
4 hundred-year flood event, would it similarly be
5 a noticeable impact?

6 A. There's a difference between area and
7 depth. All right? So that .8 acres, because
8 it's closer to the dam, to the spillway, there's
9 a greater increase in depth of flooding. Once
10 you get further from the spillway and downstream
11 of State Route 29, the increase in depth of
12 flooding is very, very small.

13 Q. You have a separate table for parcels
14 impacted by -- well, Table 7 identifies acres
15 impacted by spillway, correct?

16 A. Correct.

17 Q. And one of those parcels is Carmen and
18 Jill Ellis, and you have .8 additional acres
19 impacted for the hundred-year event, correct?

20 A. Correct.

21 Q. You're not -- and you're not an
22 appraiser, right?

23 A. No.

24 Q. You don't have any licenses as far as an

1 appraiser goes?

2 A. No.

3 Q. You can't -- you're not determining the
4 value of properties as far as one that has .8
5 acres impacted versus another one that has .8
6 acres impacted by flooding, correct?

7 A. No.

8 Q. The Linn Grove gage station -- have you
9 ever looked at the monthly flow records for the
10 Linn Grove station from 1964 to today?

11 A. Yes.

12 Q. Have you ever tried to split them up
13 between 1964 and 1997 and 1997 to today?

14 A. No.

15 Q. So you have no knowledge as to whether
16 the monthly average has increased for 10 of the
17 12 months since 1997?

18 MS. WORLY: Objection.

19 What area are we talking about?

20 MR. FUSONIE: The Linn Grove gage
21 station.

22 Q. You don't have any knowledge as to
23 that --

24 A. No.

1 Q. -- one way or another?

2 Have you looked at the daily flow
3 records for the Linn Grove gage station since
4 1964 to the present?

5 A. I have looked at that gage data, yes.

6 Q. Have you identified any high daily flows
7 since 1964 to today?

8 A. I did not do it. Since it was not
9 included to calibrate the model, I did not do a
10 thorough investigation of the gage.

11 Q. So you're not aware --

12 A. I looked at the data but I did not do
13 any kind of analysis.

14 Q. You're not aware that the three highest
15 daily flows at the Linn Grove station since 1964
16 all occurred after 1997?

17 A. No.

18 Q. You testified on questions from
19 Ms. Worly about this one-quarter-inch increase
20 in elevation was insignificant, was how you
21 described it.

22 A. Correct.

23 Q. But you have supplemented your report by
24 changing the data in Figure 2.5; is that

1 correct?

2 A. Correct. Table 2.5.

3 Q. Table 2.5, sorry.

4 After Dr. Campbell's deposition
5 yesterday, did you perform any investigation or
6 research as a result of his deposition?

7 A. No.

8 Q. Were you asked to perform any research
9 or investigation as a result of any testimony
10 that Dr. Campbell provided yesterday during his
11 deposition?

12 A. No.

13 Q. Have you reviewed any of the landowner
14 affidavits in this lawsuit?

15 MS. WORLY: Objection; asked and
16 answered.

17 Also, it's beyond the scope.

18 MR. FUSONIE: It's not beyond the scope.
19 I'm trying to establish something about -- it's
20 not beyond -- well, you have your objection.

21 MS. WORLY: All right.

22 A. Not all of them, but some of them I have
23 read.

24 Q. Did you review any that had aerial maps

1 to explain why it is.

2 MR. COLE: The objection's on the
3 record.

4 MR. FUSONIE: Yes, it is.

5 Q. So what you're saying is that the
6 testimony of the landowners in this case as to
7 increased flooding wasn't important to you?

8 A. No, I did not say that.

9 Q. You just skimmed it? Isn't that what
10 you just said? You just read through them very
11 quickly is what you testified, correct?

12 A. Correct.

13 MR. FUSONIE: Okay. That's all I have.
14 Thank you.

15 I know you're going to advise him on
16 whether to read or not. While we're on the
17 record, I know we talked about for these
18 transcripts, they would be done within seven
19 days, the ones from yesterday, and then that the
20 deponent would read them within seven days.
21 Just so we have that, as well, for these -- I
22 forgot to do it for Dr. De Groot, but can we
23 agree for this deposition and Dr. De Groot, it
24 is a similar condition?

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MS. WORLY: Yes.

MR. COLE: We will agree, possibly with the -- if we get it in on late Friday, but whenever we get it, whether we get it five, 10 days, the witness is -- the deponents will take no more than seven days to review and submit any errata.

MR. FUSONIE: Okay. Thanks.

MS. WORLY: You have the right to read and review and correct your deposition transcript. And I would suggest -- I can't tell you what to do, but I generally think that's a good idea. It's up to you to make the decision.

THE WITNESS: I would like to.

MS. WORLY: We call it read.

THE WITNESS: I would like to read.

--0--

Thereupon, the testimony of April 29, 2010, was concluded at 5:53 p.m.

--0--

TADD HENSON, P.E.
APRIL 29, 2010

1 *Attach to the deposition of TADD HENSON, P.E.
2 DONER, ET AL. V. ODNR, ET AL.
Case No. 2009-1292

3 STATE OF OHIO :
4 COUNTY OF Franklin : SS:

5 I, TADD HENSON, P.E., do hereby
6 certify that I have read the foregoing
7 transcript of my deposition given on April 29,
8 2010; that together with the correction page
9 attached hereto noting changes in form or
10 substance, if any, it is true and correct.

11 Tadd Henson

12 I do hereby certify that the foregoing
13 transcript of TADD HENSON, P.E. was submitted
14 for reading and signing; that after it was
15 stated to the undersigned notary public that the
16 deponent read and examined the deposition, the
17 deponent signed the same in my presence on
18 this 12th day of May, 2010.

19 Julie F. Klusty
20 NOTARY PUBLIC
21 My commission expires: 8/6/2011



JULIE F. KLUSTY
Notary Public, State of Ohio
My Commission Expires 8-6-2011

24

1 CERTIFICATE

2 STATE OF OHIO :
3 COUNTY OF FRANKLIN : SS:

4 I, Sara S. Clark, RPR/CRR/CCP/CBC, a
5 Notary Public in and for the State of Ohio, duly
6 commissioned and qualified, do hereby certify
7 that the within-named TADD HENSON, P.E. was
8 first duly sworn to testify to the truth, the
9 whole truth, and nothing but the truth in the
10 cause aforesaid; that the testimony then given
11 was reduced to stenotypy in the presence of said
12 witness, afterwards transcribed; that the
13 foregoing is a true and correct transcript of
14 the testimony; that this deposition was taken at
15 the time and place in the foregoing caption
16 specified.

17 I do further certify that I am not a
18 relative, employee or attorney of any of the
19 parties hereto; that I am not a relative or
20 employee of any attorney or counsel employed by
21 the parties hereto; that I am not financially
22 interested in the action; and further, I am not,
23 nor is the court reporting firm with which I am
24 affiliated, under contract as defined in Civil
Rule 28(D).

16 In witness whereof, I have hereunto
17 set my hand and affixed my seal of office at
18 Columbus, Ohio, on this 6th day
19 of May, 2010.

19 Sara S. Clark
20 Sara S. Clark, RPR/CRR/CCP/CBC
21 Notary Public, State of Ohio.

21 My commission expires: March 10, 2013

22

23

24

AFFIDAVIT OF TADD H. HENSON

10. My expert opinion and the facts and data on which my opinion is based are contained in my reports, a true and accurate copy of which is attached as Exhibit B and incorporated in this affidavit.

Tadd H. Henson

Tadd H. Henson

Sworn to and subscribed before me this 1st day of March, 2010.

Julie F. Klusty

Notary Public



JULIE F. KLUSTY
Notary Public, State of Ohio
My Commission Expires 8-6-2011

Tadd H. Henson PE CFM
Senior Associate



Stantec

Mr. Henson has over twelve years of experience working on complex civil engineering projects with a focus of flood studies. He has also worked on the design of bridges and culverts, scour analysis, dams and reservoirs, flood insurance studies, watershed studies, storm sewer systems, detention basins, levees, plan and specification development and review, mine reclamations and landfills. He is proficient in a variety of hydrologic and hydraulic models and is proficient in the application of Geographic Information Systems (GIS) to aid in engineering analysis. Over the past six years, Mr. Henson has been responsible for conducting flood studies for thousands of stream miles of in states throughout the Midwest including Ohio, Michigan, Iowa, Kansas, Nebraska, Missouri, and Indiana. These studies were completed for the Federal Emergency Management Agency (FEMA) and are published on Flood Insurance Rate Maps (FIRMs).

EDUCATION

BS, Civil Engineering, Tri State University, Angola, Indiana, 1997

MS, Civil Engineering, The Ohio State University, Columbus, Ohio, 2001

REGISTRATIONS

Professional Engineer #66954, State of Ohio

Certified Floodplain Manager #US-04-01182, Association of State Floodplain Managers

PROJECT EXPERIENCE

Flood Studies

FEMA Production and Technical Services Contract, Regions I, V, VII, and X.

Mr. Henson provides technical oversight and project management for flood studies for the Federal Emergency Management Agency (FEMA). Current studies are being conducted in the states of New Hampshire, Ohio, Illinois, Michigan, Iowa, Kansas, Nebraska, and Idaho.

FEMA Region VII IDIQ, Iowa, Missouri, Nebraska and Kansas

Mr. Henson provides project management and technical oversight for countywide floodplain map modernization efforts in for multiple projects in Iowa, Missouri, Nebraska and Kansas. The projects involved, determining 100-year

floodplain extents, redelineation of effective floodplain areas; establishing new Zone A boundaries (i.e. approximate studies); incorporation of existing detailed studies, leverage studies, and Letters of Map Change (LOMC's); and coordination with local community partners. Project deliverables include development of updated county-wide DFIRM mapping, a revised Flood Insurance Study report, and a Technical Support Data Notebook (TSDN).

FEMA Region V IDIQ Contract HSFE05-05-D-0026, Ohio, Indiana, Michigan, Wisconsin, Minnesota, and Illinois

Mr. Henson provides project management and technical oversight for countywide floodplain map modernization efforts in for multiple projects in Ohio, Indiana, Michigan and Illinois. The projects involved, determining 100-year floodplain extents, redelineation of effective floodplain areas; establishing new Zone A boundaries (i.e. approximate studies); incorporation of existing detailed studies, leverage studies, and Letters of Map Change (LOMC's); and coordination with local community partners. Project deliverables include development of updated county-wide DFIRM mapping, a revised Flood Insurance Study report, and a Technical Support Data Notebook (TSDN).

Franklin County, Ohio Floodplain Permit Review
Under contract with the Economic and Planning Department of Franklin County, Ohio, Mr. Henson conducts technical reviews of submitted flood studies for compliance with County Regulations, FEMA standards and standard engineering practice.

* denotes projects completed with other firms

Tadd H. Henson PE CFM
Senior Associate

Linn County, Iowa Levee Mapping, Cedar Rapids, Iowa
Under contract with FEMA Region VII, Mr. Henson was the project manager on a project to incorporate updated hydraulic modeling for the Cedar River in Cedar, Iowa. The results of the study were incorporated into the Digital Flood Insurance Rate Maps (DFIRMs) for Linn County to account for a levee that had been de-accredited. Stantec produced workmaps for the City to aid in recovery efforts following the flooding during the summer of 2008.

Polk County, Iowa Levee Mapping, Des Moines, Iowa
Under contract with FEMA Region VII, Mr. Henson was the project manager on a project to incorporate updated hydraulic modeling for Des Moines River, Fourmile Creek, Raccoon River, and Walnut Creek within the City of Des Moines, Iowa. The updated hydraulic models included the remapping of de-accredited levees on Des Moines River and to meet FEMA Guidelines and Specifications (G&S). The results of the study were incorporated into the Digital Flood Insurance Rate Maps (DFIRMs) for Polk County. Both Provisionally Accredited Levees (PALs) and de-accredited levees were included in this project and mapped.

Licking County DFIRM Mapping, FEMA Region Licking County DFIRM Mapping, FEMA Region V, Licking County, Ohio

The Federal Emergency Management Agency's Region V has chosen counties within their region to be part of their Map Modernization Initiative. Licking County was chosen as one of those counties, mainly due to their proactive floodplain management and GIS data. As the lead engineer on this project, Mr. Henson managed the day-to-day activities required to update Licking County's paper maps to a single seamless digital countywide map. The updated incorporated updated hydrologic and hydraulic modeling and included mapping for approximately 440 stream miles.

Symmes Road LOMR, Butler County, Ohio

The Union Centre Boulevard Extension (formerly Symmes Road Extension) from State Route 747 to Seward Road was opened for traffic on December 10, 2001. The project included a 1.7 mile, four lane roadway with eight foot paved berms. The project also included the construction of the Union Centre Boulevard Bridge over Mill Creek. The bridge crosses Mill Creek and a CSX Railroad approximately 2,750 feet upstream from the existing SR 747 Bridge. The construction of

this bridge required Butler County Transportation Improvement District to submit data to the Federal Emergency Management Agency (FEMA) reflecting revised flood hazard information so that National Flood Insurance Program (NFIP) maps can be revised as appropriate. Stantec was hired to complete a Letter of Map Revision (LOMR) for the Union Centre Boulevard bridge over Mill Creek.

Dams and Levees

Lake White Dam, Pike County, Ohio

Performed hydrologic and hydraulic computations to determine the hydraulic impacts of a project to armor the dam with Roller Compacted Concrete.

Chocktaw Lake Principal Spillway Repairs, Madison County, Ohio

Performed a condition survey of the spillway and recommended that the principal spillway pipe, a deteriorating Corrugated Metal Pipe, be slip-lined with a High Density Polyethylene pipe. Also recommended areas of repair for deteriorating concrete.

Stroman Lake Dam Rehabilitation, Saint Paris, Ohio

Mr. Henson worked with the client to determine cost effective solutions to spillway capacity and seepage problems of the dam.

Runkle Farm Pond Dam, Saint Paris, Ohio

Responsible for the investigation and design of a 20-acre lake. The lake was created by the construction of nearly 2,000 feet of earth dike. Mr. Henson oversaw the completion of the plans and specifications, permitting, and construction of dam. Responsibilities also included the preparation of an Emergency Action Plan (EAP) that could be implemented in the event of a dam failure. The EAP includes the analysis of a dam failure and the determination of the subsequent downstream inundated area.

Zanesville State Nursery Dam, Zanesville, Ohio

Performed Hydrologic and Hydraulic Modeling to determine cost effective solution for increasing the spillway capacity, while at the same time increasing water capacity available for irrigation. The final design included raising the dam and constructing an open channel reinforced concrete spillway spanned by a box beam bridge. Responsibilities also

* denotes projects completed with other firms

Tadd H. Henson PE CFM
Senior Associate

included the preparation of an Emergency Action Plan (EAP) that could be implemented in the event of a dam failure. The EAP includes the analysis of a dam failure and the determination of the subsequent downstream inundated area.

Jackson Lake State Park Dam, Oak Hill, Ohio

Mr. Henson was responsible for the design and investigation for the rehabilitation of Jackson Lake State Park Dam. Mr. Henson's responsibilities included performing geotechnical analysis of the dam and hydrologic and hydraulic analysis of the existing dam and spillway system and preparing a list of options for improving the capacity of the spillway system and safety of the dam. Mr. Henson also prepared plans and specifications for the improvements to the dam, which included the design of Roller Compacted Concrete (RCC) as overtopping protection on the downstream face of the dam, and expansion of the existing open channel reinforced concrete stepped spillway, and the lining of a deteriorated Corrugated Metal Lake Drain Pipe with a High Density Polyethylene Pipe. An emergency action plan for the dam was also developed. This involved performing a dam break analysis and routing the flows from the dam break downstream. The modeling was performed using the National Weather Service's DAMBRK software.

Glass Rock Plant Dam Raising, Glenford, Ohio

Mr. Henson performed engineering analysis and design of a tailings dam raising. The dam was raised 17 feet to extend the life of the tailings pond. Mr. Henson performed a Hydrologic and Hydraulic Investigation and designed the principal and emergency spillway systems. He also performed slope stability analyses for the proposed dam raising. The slope stability analyses showed that elevated pore pressures in the foundation materials were a concern; therefore, Mr. Henson oversaw the installation of pneumatic piezometers and the monitoring of pore water pressures during construction.

Lima Reservoirs Emergency Action Plan, Ohio

Mr. Henson was responsible for the preparation dam failure analyses and inundation mapping for several upground reservoirs in the City of Lima, Ohio. The modeling was performed using the National Weather Service's DAMBRK software.

Maker's Mark Earthen Dam Expansion Project, Loretto, Kentucky

Maker's Mark Distillery's planned facility expansion required enlarging the process water source lake at its distillery in Loretto, Kentucky. The dam was originally constructed during the 1930s and no original design or construction records were available. The crest of the existing dam was narrow, and limited freeboard existed above the normal pool. Design requirements included raising the normal pool level by 10 feet, thus increasing the volume by nearly 28 million gallons. All appurtenances had to remain functional during construction to maintain distillery production. Mr. Henson served as the project lead to complete a dam failure analysis. A dam breach hydrograph was generated using HEC-FMS and then routed downstream using the unsteady flow option in HEC-RAS.

Olen Quarry Levee Removal, Prairie Oaks Metro Park, Franklin County, Ohio

An existing levee system adjacent to Big Darby Creek at Prairie Oaks Metro Park protects the quarry area from flooding. However, this levee also acts as a barrier to floodplain access for the stream and is a source of stream bank erosion. When the Franklin County Metro Parks assumed control of this land, they were interested in removing sections of the levee in order to reduce the frequency and occurrence of stream bank erosion and to re-establish the stream's connection with the floodplain. Mr. Henson performed complex unsteady state modeling in order to predict the interaction of the stream and quarry pond under existing conditions and once the levee was removed. The model results will also be used to assist in the geomorphologic design of the project.

Thompson Ditch Flood Protection, Terre Haute, Indiana

Lead Design Engineer for the investigation and design of over 6 miles of levee and floodwall in the City of Terre Haute, Indiana. Mr. Henson's responsibilities included hydraulic modeling of the pre and post project conditions, preparation of a Conditional Letter of Map Revision, evaluation of the Stormwater management for drainage inside the levee, reinforced concrete floodwall design, geotechnical analysis and design of the earth flood levee, and design for management of floodwater outside the levee.

* denotes projects completed with other firms

Tadd H. Henson PE CFM
Senior Associate

Bridges

Allen Road Bridge over East Fork Mill Creek, Hydraulic Analysis, Ohio

Mr. Henson was responsible for performing an unsteady flow analysis for East Fork Mill Creek in order to determine the flooding impacts of constructing a new bridge. Mr. Henson developed an unsteady flow model and analyzed several different bridge configurations in order to find a new bridge that would pass the 100 year flood while minimizing additional downstream flooding. Mr. Henson was also responsible for performing a scour analysis of the new bridge.

Brown Road over Bokes Creek, Delaware County, Ohio

Mr. Henson was responsible for performing a flood study to determine the impacts of a bridge replacement. Mr. Henson performed an analysis from the existing and proposed conditions and assisted in preparing of the floodplain permit.

Emergency Planning / Response

Gibson Station Cooling Reservoir Emergency Action Plan, Owensville, Indiana

Mr. Henson was responsible for the preparation of an Emergency Action Plan (EAP) that could be implemented in the event of a failure of the 3000-acre Gibson cooling reservoir. The EAP included the analysis of various failure scenarios and the subsequent area inundated by the failure.

Flood Control and Drainage Management

Wm. H. Zimmer Landfill, Clermont County, Ohio

Performed design for the control of surface water within the Zimmer FGD landfill. Design included diversion berms, channels, and a sedimentation pond.

Mallard Pond Erosion Control, Fairfield County, Ohio

Mr. Henson was responsible for the preparation of plans and specifications for the construction of bank protection for a drainage ditch that was eroding an adjacent pond embankment. The design included the use of an erosion control mat and rock riprap protection in various areas. Mr. Henson completed the applications and obtained permits as required under Section 401 and 404 Clean Water Act. Mr. Henson also facilitated the bidding process for the client and oversaw the construction of the project.

American Electric Power Floodplain Permits, Ohio and West Virginia

On three separate occasions American Electric Power has contacted with Stantec to assist with floodplain permitting issues for expansions of existing facilities. Stantec assisted AEP with floodplain permitting by evaluating multiple alternatives for several landfill expansions as well as several the construction of river cells within the floodway. Work was completed for facilities in both Ohio and West Virginia. Mr. Henson oversaw all work completed for these projects and coordinated with the FEMA group that reviews Letters of Map Revisions (LOMRs).

Hydrologic / Hydraulic Assessments

M.L. "Red" Trabue Park, Dublin, Ohio

Mr. Henson was responsible for performing Hydrologic and Hydraulic computations and earthwork balance computations to assist the landscape architects in storm water management for the design of wetlands and ponds for the park.

Stormwater Sewers and Force mains

Storm Sewer Modeling and Evaluation, Marion Road Area, Columbus, Ohio

Some portions of the Marion Road area storm water system do not have sufficient capacity, and include combined sewers that need to be separated. Mr. Henson performed SWMM modeling in order to evaluate alternative sewer designs for separating combined flow and increasing sewer capacity.

Storm Sewer System Design, Skyline Drive Subdivision, Columbus, Ohio

Mr. Henson oversaw the design of a storm sewer system for a 1950's residential development. Residents experience local flooding problems as a result of the flat topography and the limited capacity of the existing storm drains.

Watershed Planning

Hellbranch Watershed Forum Action Plan, Franklin County, Ohio

Mr. Henson was the project manager responsible overseeing a team of Engineers, Scientists and GIS professionals guiding the development of the watershed action plan for the Hellbranch Watershed. Hydrologic and Hydraulic analyses for existing conditions and several possible future conditions

* denotes projects completed with other firms

Tadd H. Henson PE CFM
Senior Associate

were conducted in order perform an impact analysis to determine the effects that urbanization will have on the watershed. Mr. Henson has also been responsible for undertaking the cost effectiveness and incremental cost analyses for the various ecosystem restoration alternatives identified for the restoration sites in the watershed. Potential restoration sites were identified through a geomorphic assessment and a wetlands inventory. The geomorphic assessment included the characterization of the major streams in the watershed and the identification of problem areas that could be viable candidates for stream restoration efforts, as well as a characterization of the riparian areas surrounding the streams. The wetlands inventory included the identification of existing wetlands along with significant areas of hydric soils that would support future wetlands. Specific ecosystem restoration alternatives were developed for one chosen restoration site and these alternatives were evaluated through the cost effectiveness and incremental cost analyses as required by the Army Corps of Engineers. Ecological benefits have been calculated for wetlands using Ohio Rapid Assessment Method (ORAM) scores, and for streams, the ecological unit used is the Qualitative Habitat Evaluation Index (QHEI) score.



ADDENDUM TO THE
HYDROLOGIC AND HYDRAULIC ANALYSIS
GRAND LAKE ST. MARYS DISCHARGE TO BEAVER CREEK
MERCER AND AUGLAIZE COUNTIES, OHIO

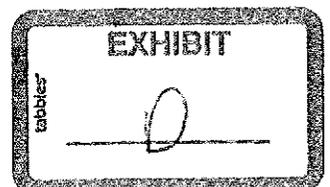
Case Leasing and Rental, Inc. Property
Celina, Ohio

Prepared for:

Schottenstein Zox & Dunn Co., LPA
250 West Street
Columbus, Ohio 43215

NOVEMBER 2006

CONESTOGA-ROVERS & ASSOCIATES
4915 S. Sherwood Forest Blvd.
Baton Rouge, LA 70816



ADDENDUM TO THE
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EXECUTIVE SUMMARY

This addendum report was prepared as a supplement to the May, 2006 report, *Hydrologic and Hydraulic Analysis Grand Lake St. Marys Discharge to Beaver Creek, Mercer and Auglaize Counties, Ohio* prepared by Conestoga-Rovers & Associates (CRA).

The CRA May 2006 Report evaluated the impact of the replacement of the spillway at Grand Lake St. Marys (GLSM) on flooding along Beaver Creek and analyzed nine severe historical storm events between 1913 and 2006. The modeling of these storm events was conducted using the historical rainfall data in the GLSM area. The discharge of water over the 39.4-foot spillway was compared to the discharge of water over the 500-foot spillway installed in 1997. The purpose of this analysis was to determine whether and to what extent the design and construction of the 1997 spillway affected the frequency and severity of flooding on properties (and specifically the Case property) along Beaver Creek.

After the trial of this matter was continued on August 29, 2006, CRA was finally able to obtain accurate GLSM lake level data from 1927 to 2006. Using this information, CRA was able to complete a more accurate analysis of historical storm events. A total of sixteen severe storm events were analyzed to determine the potential for flooding along Beaver Creek. The additional analysis by CRA, using the best available data, demonstrates that never during the entire period of record did the 39.4-foot spillway cause the Case sports complex to flood. However, the 500-foot spillway would have caused the Case property, and numerous other properties, to flood ten (10) times.

Contrary to accepted engineering practice, ODNR did not consider and/or model actual historical rainfall data or historical lake elevations during the development and implementation of its plan to manage the probable maximum flood through GLSM. Had ODNR completed such an evaluation, they would have known that their decision to replace the 39.4-foot spillway with their 500-foot spillway would cause - indeed, has now four times since its installation caused (July and December, 2003; January 2005; and June 2006)¹ - severe flooding in Beaver Creek and the nearby properties. ODNR's design and installation of the existing 500-foot spillway is indefensible. Feasible alternatives were and are available to ODNR, but these alternatives were not employed. If ODNR does not take action to correct its mistake, flooding along Beaver Creek will continue to occur.

¹ Refer to Table 1 and Figures 7a and 7b through 10a and 10b.

BACKGROUND

A. The CRA May 2006 Report and Efforts to Obtain Lake Level Data Prior to August 28, 2006

The CRA May 2006 Report analyzed ODNR lake level data (reported in feet above mean sea level, msl) between 1927 and 1978, that was provided to CRA by the Louisville District Army Corps of Engineers (USACE). In addition, ODNR directly provided to CRA lake level measurements (reported as \pm inches above an ambiguously described elevation²) that it had collected between 1972 and 2006, as well as some field notes that purported to explain how to translate ODNR's measurements into a standard elevation (i.e., feet msl). Prior to the August 28, 2006 trial, Case (both through its counsel and CRA) repeatedly contacted ODNR in an attempt to obtain clarification of the ODNR measurement technique and field notes, but was never able to obtain this clarification. As a result, CRA did not have accurate lake elevations and completed its historical storm modeling for the May 2006 Report using historical recorded rainfall data.

B. The August 28-29, 2006 Trial

On August 28, 2006, Dr. Pressley Campbell testified on behalf of Case regarding the impact of the replacement of the western spillway at GLSM on flooding along Beaver Creek. During the testimony of ODNR's witness, Doyle Hartman, it was learned that Hartman was relying on lake level data—provided to him only a couple of days before trial—that was never provided and/or explained to Case's counsel or CRA prior to trial. On the basis of this data, Hartman criticized the CRA modeling of historical storms because CRA's modeling was not performed using GLSM lake levels. As a result, the trial was postponed to allow Case to take necessary steps to obtain accurate lake level data. CRA traveled to GLSM on August 29th and met Mr. Steven Dorsten of ODNR to observe and photograph the GLSM gauge located on the eastern

² During the deposition of Steve Dorsten on September 8, 2006, ODNR's lake measurement practices were revealed. According to Dorsten—whose understanding of the mathematics involved is based solely on the oral history provided him by his long-departed supervisor—ODNR collects measurements at one of three lake gauges, not all of which are at the same elevation, in \pm inches of the "0" marking on the gauge. For readings collected prior to July 1988, 3 inches were to be added to the reading. For readings collected after July 1998, 7 inches were to be added to the reading. The basis for the addition of 3 inches to the measurement was that when the eastern outlet structure gauge was installed in approximately 1940, it was reportedly installed 2.78 inches below the crest of the 39.4-foot spillway and since the elevation of the spillway crest was known, one could back-calculate the lake elevation. The measurements began adding 7 inches because in July 1988 the crest of the 39.4-foot spillway was raised by approximately 4 inches, so 7 inches were needed in the back-calculation procedure.

outlet structure. Dorsten was personally responsible for recording measurements from the GLSM gauges since 1976.

C. Survey of the Lake Gauges

On September 8, 2006, Mr. Dorsten was deposed and testified that there are three different gauges at GLSM. Dorsten also testified that the elevation of the gauges was not known by ODNR; specifically, that no survey of any of the existing gauges (to determine if they were accurately measuring the elevation of the lake) was to be found in ODNR's files. Accordingly, ODNR and Case jointly arranged for the completion of a survey of the elevation of the three gauges by a licensed professional land surveyor. On September 19, 2006 Lee Surveying, Inc., of Bellefontaine, Ohio, completed this survey, the results of which are attached as Appendix A. The survey revealed that the gauges were not at the elevations ascribed to them by ODNR, meaning that the GLSM lake levels have been consistently under-reported by ODNR.

ADDITIONAL ANALYSIS PERFORMED BY CRA

In order to accurately determine the lake levels between 1927 and 2006 and complete an accurate analysis of the impact of the spillway replacement, CRA completed the following tasks:

- (1) CRA calculated the GLSM lake levels for the period April 1, 1927 to August 21, 2006 based upon the actual elevation of the three lake gauges at GLSM, as determined by the survey. The survey demonstrates that the lake elevations reported by ODNR for the last seventy-nine years were less than the actual lake elevations. The lake elevation data are attached in Appendix B.
- (2) Using the correct historical lake levels, CRA calculated the actual discharge of water that flowed (or would have flowed) over the 39.4-foot spillway and the 500-foot spillway, respectively, into Beaver Creek between April 1927 and August 2006. The results of the calculations are illustrated on Revised Figure 3 attached as Appendix C. Using the accurate lake levels, this analysis reveals that, had the ODNR-designed 500-foot spillway been constructed 70 years earlier (in 1927), fifteen storm events between 1927 and 2006 would have resulted in flow that exceeds the capacity of Beaver Creek, resulting in flooding; an average of approximately once every five years.
- (3) CRA evaluated the rainfall record from 1913 to 2006 and the accurate historical lake levels from 1927 to 2006 to identify the historical periods where rainfall resulted in high lake elevations, the factors that can cause severe runoff and flooding in the GLSM area. The evaluation identified sixteen storm events that had such an impact:

March/April	1913	June/July	1993
January	1930	February/March	1997
April	1938	July/August	1998
May	1943	May	2002
February	1950	June/July	2003
April/May	1972	December	2003
May	1981	January	2005
July	1992	June	2006

(4) Using the HEC-2 computer model employed by ODNR, CRA determined the water surface elevation along Beaver Creek that had (or would have) occurred from the discharge over the 39.4 and 500-foot spillways for the sixteen most significant storm events that occurred between 1913 and 2006. These results demonstrate that, with the 39.4-foot spillway, the Case sports complex would not have flooded during a single event. However, with the 500-foot spillway, water in Beaver Creek overflows the channel banks and inundates the Case property ten times: in 1913, 1930, 1943, 1981, 1992, 1993, July 2003, December 2003, 2005, and 2006. The results of this modeling are presented on Table 1 and illustrated on Figures 1a and 1b through 10a and 10b.

(5) CRA completed an analysis of the lake levels from 1927 through 1997—when ODNR ceased managing lake levels—and 1997 through 2006, when ODNR no longer managed lake levels. The results of the lake level analysis are presented on Table 2. The results follow:

- o Since 1997, 73.3 percent of the measurements taken reflect lake level elevations above 870.6 feet msl, the elevation at which water overflows the 50-foot long notch in the spillway and enters Beaver Creek. Before 1997, the lake level was above 870.6 feet for only 21.4 percent of the measurements.
- o Since 1997, 26.3 percent of the measurements collected reflect lake level elevations above 871.5 feet msl, the elevation at which water overflows the entire 500-foot length of the spillway. Before 1997, the lake level was above 871.5 feet for only 2.4 percent of the measurements.
- o Since 1997, 10 percent of the measurements taken reflect lake level elevations above 871.8 feet msl, the lake elevation at which the 500-foot spillway discharges a quantity of water that will overflow the Beaver Creek channel banks at the Case property. Before 1997, the lake level exceeded 871.8 feet for only 1 percent of the measurements.

As evident above, since the construction of the 500-foot spillway in 1997, the lake levels of GLSM are consistently and significantly higher than historically. When the lake level of GLSM is above 870.6 feet msl, water is discharging into Beaver Creek. If the lake is at or above that

elevation when a storm event occurs, the storm is more likely to cause flooding in Beaver Creek, regardless of the size of the event; and the higher the initial lake elevation, the more dramatic the impact will be. The combination of the 500-foot spillway and the ODNR policy of not managing the lake levels drastically increases the risk of flooding for downstream property owners. This risk has become reality four times since the construction of the 500-foot spillway, (July and December, 2003; January 2005; and June 2006)³.

For example, on July 2, 2003, three days before the storm began that inundated Case, the elevation of the lake was 871.2 feet msl, more than seven (7) inches above the notch (870.6 feet). For the December, 2003 event, the initial lake elevation was 871.7 feet msl, more than one foot above the notch and two inches higher than the remaining 450 feet of the spillway (871.5 feet).

ANALYSIS OF DOYLE HARTMAN'S REPORT AND METHODOLOGY

During his testimony on August 28, 2006 and in his report dated July 14, 2006, Mr. Hartman implied that the frequency and severity of flooding in Beaver Creek resulting from the 1997 spillway replacement are minimal. However, when CRA evaluated the new lake elevations, in conjunction with the historical rainfall information, the analysis disclosed that Hartman's conclusions are not supported by the data. (Indeed, the potential for flooding in Beaver Creek as a result of the 500-foot spillway installation is far more severe than initially reported in the May 2006 CRA report.) CRA examined Hartman's methodology to determine why his calculations of the frequency and severity of flooding in Beaver Creek underestimated the problem. To that end, CRA obtained and evaluated the HEC-HMS and HEC-RAS models used by Hartman.

A. Hartman's Use of a 24-Hour Duration Storm Event

Hartman used a 24-hour duration storm event in his modeling and analysis to predict the magnitude of flooding that would be caused by ODNR's 500-foot spillway. However, Hartman did not examine the historical record to determine if his selection of the 24-hour duration event corresponded with recorded storm durations of the past. It does not. The storm event durations that have historically resulted in the most severe flow in Beaver Creek were 72-hour, and longer events. Hartman's selection and use of the 24-hour duration event misleadingly suggests that the severity of flooding in Beaver Creek caused by the 1997 spillway is significantly less than what the Creek and adjoining properties experience during the numerous storm events that exceed 24 hours. His model does not accurately reflect the conditions of the GLSM area.

³ Refer to Table 1 and Figures 7a and 7b through 10a and 10b.

B. The Flaws in Hartman's Model

The models used by Hartman, HEC-HMS and HEC-RAS, were developed by the U.S. Army Corps of Engineers, which also promulgated guidance for the proper use of the models. Hartman's modeling deviated from the Army Corps of Engineers guidance in, at least, two key respects:

(1) Hartman modeled the 2003 storm event to determine the potential flooding along Beaver Creek. However, during modeling, Hartman used the precipitation data from only one meteorological station (Coldwater), rather than using the HEC-recommended method that prescribes the use of all available records at multiple stations. Hartman states in his July 14, 2006 report, "there were not enough detailed data to accurately determine the actual amount and distribution of rainfall in the various segments of the overall watershed." This is not true. Seven National Oceanic & Atmospheric Administration (NOAA) meteorological stations are located within a 35-mile radius of the western spillway at GLSM with precipitation data dating back to 1910. Hartman did not input the publicly available rainfall data at the six other stations, including stations at Celina and St. Marys. Instead Hartman assumed, in constructing his model, that the amount of rainfall recorded at the Coldwater station was the amount of rainfall that fell over the entire 296 square mile drainage basin he used in his model. That is not what happened. The distribution of rainfall, as recorded by the seven stations, was not similar to the distribution used by Hartman in his modeling.

Standard modeling practice is to collect the available data including rainfall, streamflow, and lake levels, and input this known recorded data into the model. Once the model is set up with the known data, unknown variables, such as soil conditions and antecedent moisture conditions, can be adjusted in an attempt to match actual recorded conditions such as, in this instance, the flood elevations measured during the 2003 flood. It violates standard practice and common sense to adjust the known, recorded data such as rainfall, as Hartman did. For his model, Hartman admits that he selected a rainfall amount from one location and assumed it was distributed uniformly over 296 square miles, "Although the actual rainfall distribution varied widely across the entire watershed, a uniform distribution was assumed in the entire watershed analysis." This is a gross misuse of the modeling process. The results from a model that bases its conclusions on inaccurate depictions of known, recorded conditions, such as the amount of rainfall and rainfall distribution, is not credible.

(2) Hartman modeled the 2003 storm event using the methodology described above. His conclusion was that the flood elevations in Beaver Creek immediately downstream of GLSM were approximately 861 feet msl for the 500-foot spillway and approximately 857.5 feet msl for the 39.4-foot spillway. This is approximately a 3.5 foot difference in elevation as a result of the replacement of the spillway as stated by Hartman in his July 2006 Report. The Mercer County Engineers Office surveyed the 2003 flood elevation on July 9, 2003 during the flooding, directly

downstream of the 500-foot spillway and determined the flood elevation to be 861.8 feet msl. This differs from Hartman's model by approximately 0.8 feet. Therefore, the model used by Hartman underestimates the amount of flooding that occurred in 2003 at the Case property and likely also underestimates the amount of flooding caused by other storms. There is no indication that Hartman made an attempt to verify the accuracy of his model by comparing the model output to recorded flood elevations, as standard engineering practice dictates.

CONCLUSION

The use of accurate historic lake elevations in the calculations and modeling of discharge into Beaver Creek from GLSM demonstrates that the potential for flooding as a result of the installation of the 500-foot spillway is substantially worse than originally reported in the CRA May 2006 Report, which used precipitation data to predict flooding. However, because ODNR failed to consider and analyze historical lake level data or precipitation data—as is standard engineering practice—, it did not realize that the installation of the 500-foot spillway would cause, and now has repeatedly caused, frequent and severe flooding in Beaver Creek, and the surrounding properties (including the Case property).

The impact of this error has been greatly compounded by ODNR's decision to adopt a laissez faire approach towards lake level "management"; a decision that was apparently made without any consideration, or scientific analysis, of the effect that this decision would have, and has had, on Case and the people living and working in the vicinity of Beaver Creek.

As stated in CRA's earlier report and in the testimony of Dr. Campbell, ODNR had feasible alternatives available in 1997 to prevent GLSM from overtopping the embankments separating the lake from the City of Celina, without sacrificing the property and endangering the safety of the residents near Beaver Creek. ODNR failed to utilize those measures. It has also failed to take the simple measure of opening the gates in the spillways, as necessary, to avoid the risk that higher lake elevations have on flooding. ODNR's actions, omissions and practices, as described in this Report, do not comport with accepted engineering standards.

All of which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

Pressley L. Campbell, Ph.D., PE
Ohio PE 56681

FIGURES

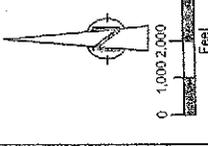
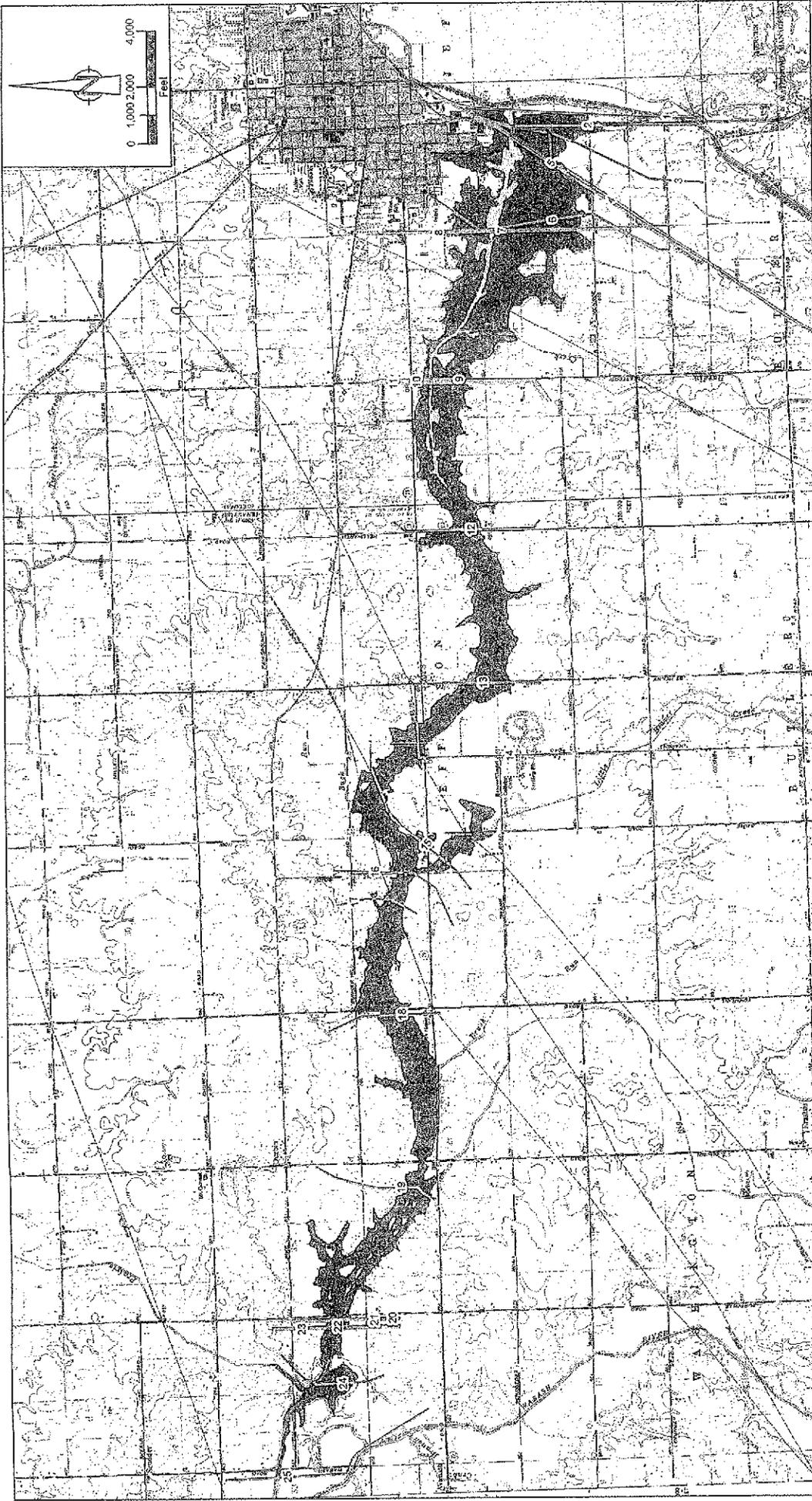


Figure 1a
MARCH/APRIL 1913 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS
- USED IN HEC-2 COMPUTER PROGRAM
- INUNDATED AREA AS THE RESULT OF THE 500-FOOT SPILLWAY
- INUNDATED AREA AS THE RESULT OF THE 39.4-FOOT SPILLWAY

CROSS SECTIONS OF BEAVER CREEK USED IN HEC2 MODEL WERE OBTAINED FROM THE FINAL REPORT: HYDROLOGIC AND HYDRAULIC ANALYSIS OF THE MARYS, AUGLAIZE AND MERCER COUNTIES, OHIO, FEBRUARY 2, 1989, BECOM ENGINEERING, INC.

UNITED STATES GEOLOGICAL SURVEY DIGITAL RASTER GRAPHICS (CELINA & ERASTUS) DOWNLOADED FROM THE OHIO OFFICE OF INFORMATION TECHNOLOGY WEBSITE

GROUND SURFACE ELEVATIONS USED WERE OBTAINED FROM THE OHIO 10 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2004.

THIS FIGURE ILLUSTRATES MODELING COMPLETED FOR THE CRA MAY 2006 REPORT AND IS IDENTICAL TO FIGURE 10 IN THE CRA MAY 2006 REPORT.



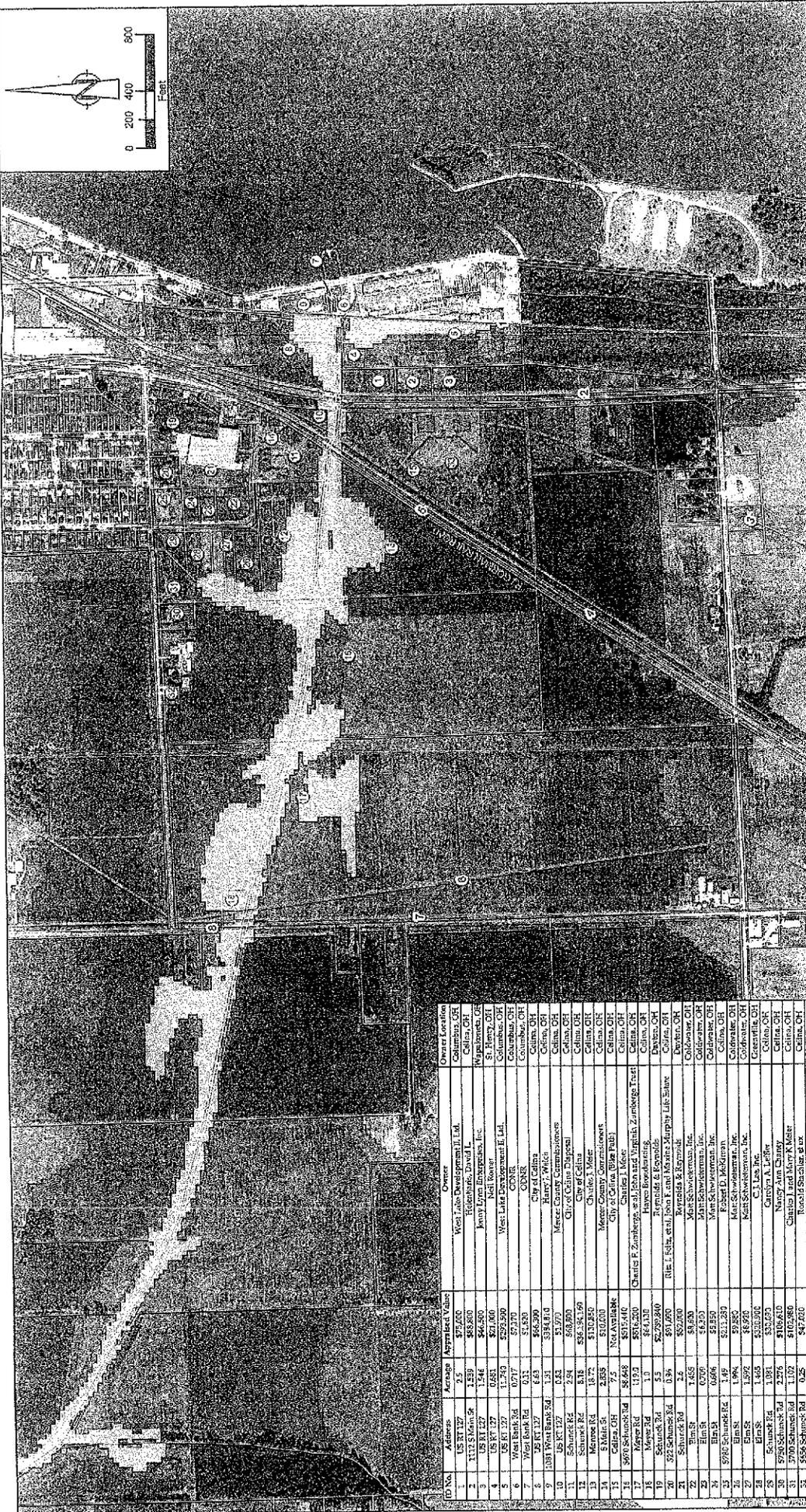


Figure 1b
MARCH/APRIL 1913 STORM EVENT
FLOOD INUNDATION MAP
Schottenstein Zox & Dunn Co., LPA
Columbus, Ohio

LEGEND
 _____ CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 _____ CROSS SECTION NUMBER AND LOCATIONS
 _____ USED IN HEC-2 COMPUTER PROGRAM
 _____ PROPERTY BOUNDARIES
 _____ INUNDED AREA AS THE RESULT OF THE 39.4-FOOT SPILLWAY
 _____ INUNDED AREA AS THE RESULT OF THE 500-FOOT SPILLWAY
 ① PROPERTY IDENTIFICATION NUMBER

ID No.	Address	Average Area (sq ft)	Owner	Owner Location
1	153 RT 127	1,450	West John Development II, Ltd.	Columbus, OH
2	153 RT 127	1,450	Holcomb, David L.	Colina, OH
3	153 RT 127	1,450	Keany Lynn Enterprises, Inc.	Wapakoneta, OH
4	153 RT 127	1,450	St. Henry Off	Columbus, OH
5	153 RT 127	1,450	West Lake Development II, Ltd.	Columbus, OH
6	153 RT 127	1,450	CDNR	Columbus, OH
7	153 RT 127	1,450	CDNR	Columbus, OH
8	153 RT 127	1,450	CDNR	Columbus, OH
9	153 RT 127	1,450	CDNR	Columbus, OH
10	153 RT 127	1,450	CDNR	Columbus, OH
11	153 RT 127	1,450	CDNR	Columbus, OH
12	153 RT 127	1,450	CDNR	Columbus, OH
13	153 RT 127	1,450	CDNR	Columbus, OH
14	153 RT 127	1,450	CDNR	Columbus, OH
15	153 RT 127	1,450	CDNR	Columbus, OH
16	153 RT 127	1,450	CDNR	Columbus, OH
17	153 RT 127	1,450	CDNR	Columbus, OH
18	153 RT 127	1,450	CDNR	Columbus, OH
19	153 RT 127	1,450	CDNR	Columbus, OH
20	153 RT 127	1,450	CDNR	Columbus, OH
21	153 RT 127	1,450	CDNR	Columbus, OH
22	153 RT 127	1,450	CDNR	Columbus, OH
23	153 RT 127	1,450	CDNR	Columbus, OH
24	153 RT 127	1,450	CDNR	Columbus, OH
25	153 RT 127	1,450	CDNR	Columbus, OH
26	153 RT 127	1,450	CDNR	Columbus, OH
27	153 RT 127	1,450	CDNR	Columbus, OH
28	153 RT 127	1,450	CDNR	Columbus, OH
29	153 RT 127	1,450	CDNR	Columbus, OH
30	153 RT 127	1,450	CDNR	Columbus, OH
31	153 RT 127	1,450	CDNR	Columbus, OH
32	153 RT 127	1,450	CDNR	Columbus, OH
33	153 RT 127	1,450	CDNR	Columbus, OH

CROSS SECTIONS OF BEAVER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT FROM SCHOTTENSTEIN ZOX & DUNN CO., LPA AND HYDRAULIC ANALYSES, GRAND LAKE ST. MARTYRS, AUGAZE AND MERCER COUNTIES, OHIO, FEBRUARY 2, 1980, BECOM ENGINEERING, INC. UNITED STATES DEPARTMENT OF AGRICULTURE AERIAL PHOTOGRAPH DATED JUNE 23, 2004. INFORMATION SHOWN IN THE TABLE AND PROPERTY BOUNDARIES SHOWN ON THE FIGURE WERE OBTAINED FROM THE MERCER COUNTY, OHIO REAL ESTATE SEARCH RESULTS. UNOFFICIAL REAL PROPERTY RECORD CARDS COMPLETED ON DECEMBER 21, 2006. GROUND SURFACE ELEVATIONS WERE OBTAINED FROM THE OHIO 10 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2004. THIS FIGURE ILLUSTRATES MODELING COMPLETED FOR THE CMA MAY 2006 REPORT AND IS IDENTICAL TO FIGURE 10 IN THE CMA MAY 2006 REPORT.



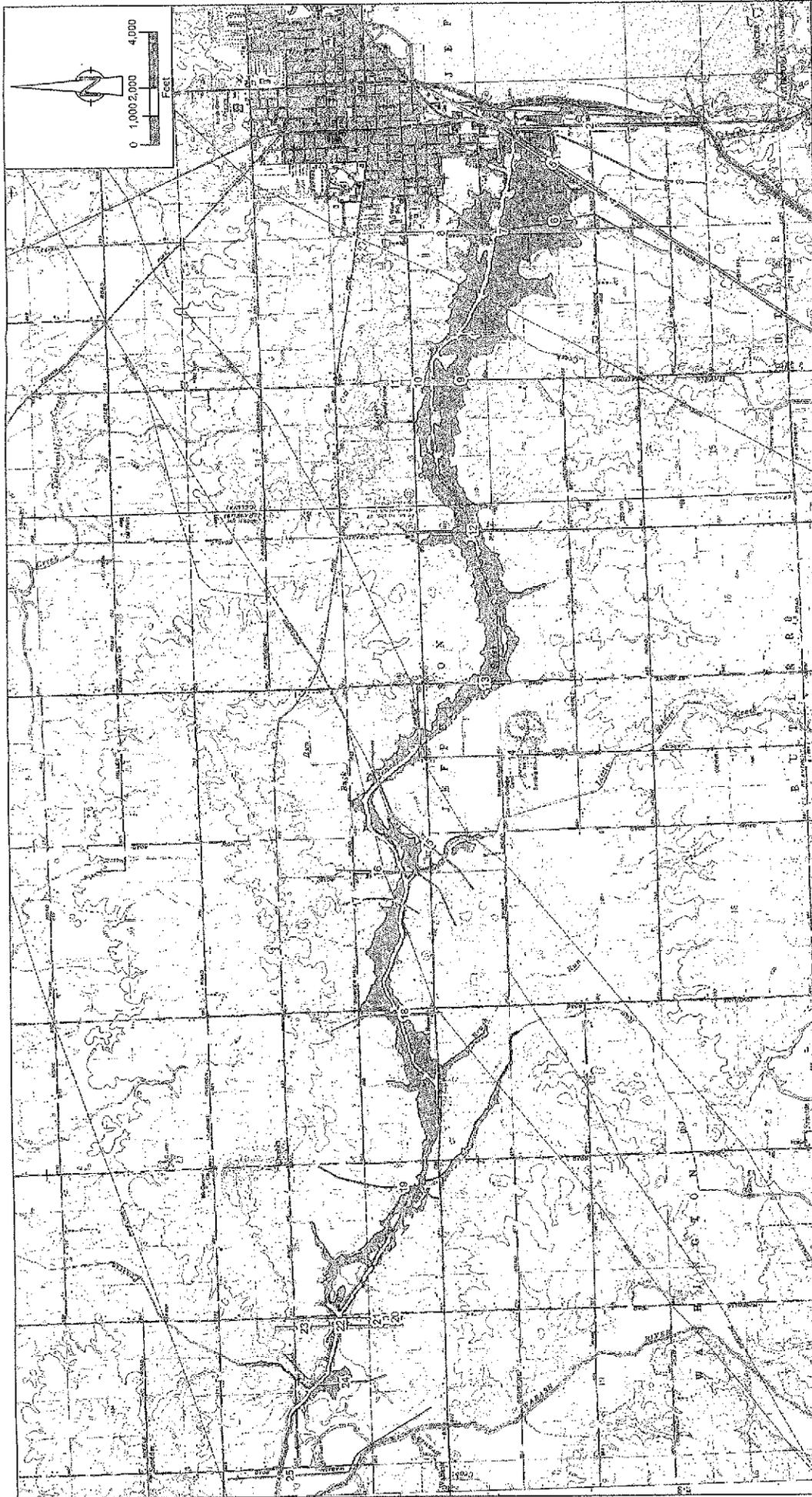


Figure 2a
DECEMBER / JANUARY 1930 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS
 - USED IN HEC-2 COMPUTER PROGRAM
 - INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

CROSS SECTIONS OF RESERVE CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE RIVAL REPORT HYDROLOGIC STUDY OF RESERVE CREEK, WATERSHEDS, KULICK AND JORDAN, COLUMBUS, OHIO.
 MAPS OF THE SCHOTTENSTEIN ZOX & DUNN COMPANY WATER SERVICE (CELLULAR DIGITAL) COMPAILED FROM THE OHIO OFFICE OF INFORMATION TECHNOLOGY WEBSITE.
 CROSS SECTION ELEVATIONS USED WERE OBTAINED FROM THE OHIO 1/4 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2004.



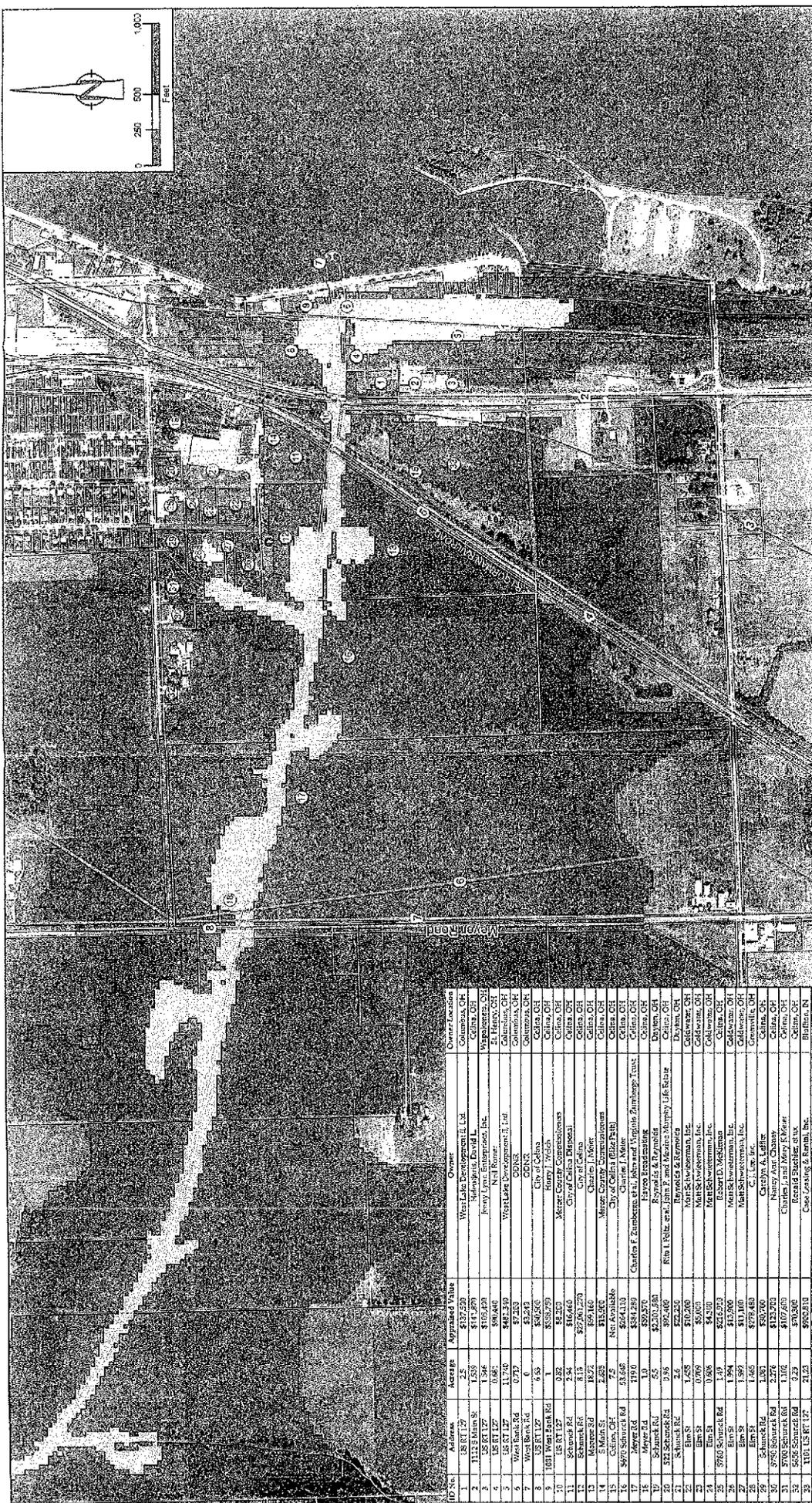


Figure 2b
DECEMBER / JANUARY 1930 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
- PROPERTY BOUNDARIES
- INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
- INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
- ① PROPERTY IDENTIFICATION NUMBER

ID No.	Address	Acres	Appraised Value	Owner	Owner Location
1	18 RT 127	2.5	\$137,520	West Lake Development II, Ltd	Columbus, OH
2	1122 Main St	1.539	\$11,297	Heflinger, David L.	Celina, OH
3	15 RT 127	1.546	\$185,431	Jenny Lynn Enterprises, Inc.	Wapakoneta, OH
4	15 RT 127	1.041	\$8,940	Nel Brown	So. Hartsville, OH
5	West Bank Rd	10.719	\$1,317	West Bank Development II, Ltd	Columbus, OH
6	West Bank Rd	6	\$1,313	CONAR	Columbus, OH
7	West Bank Rd	6	\$1,313	CONAR	Columbus, OH
8	15 RT 127	4.5	\$4,540	City of Celina	Celina, OH
9	1011 West Bank Rd	1	\$539,793	Hurry / Vorch	Celina, OH
10	15 RT 127	0.22	\$2,202	Meyer Corp. Commission	Celina, OH
11	Schwarz Rd	2.24	\$17,665	City of Celina, Municipal	Celina, OH
12	Schwarz Rd	4.19	\$11,220	City of Celina	Celina, OH
13	5 MAIN ST	2.835	\$15,345	City of Celina	Celina, OH
14	5 MAIN ST	2.835	\$15,345	Mingo County Commission	Celina, OH
15	Celina, OH	7.2	N/A	City of Celina (Blitz Park)	Celina, OH
16	3670 Schwarz Rd	23.648	\$24,110	Clayton J. Meyer	Celina, OH
17	Meyer Rd	119.0	\$584,249	Charles F. Zumbardo et al. Rita and Virginia Zumbardo Trust	Celina, OH
18	Meyer Rd	1.0	\$92,275	Payco Leasing	Celina, OH
19	Schwarz Rd	5.5	\$2,201,380	Ryan's & Reynolds	Duym, OH
20	312 Schwarz Rd	2.25	\$2,400	Rita I. Eble, et al. Rita F. and Robert Murphy J.E. Eble	Celina, OH
21	312 Schwarz Rd	2.25	\$2,400	John Schwaneman, Inc.	Duym, OH
22	Elm St	1.458	\$10,300	John Schwaneman, Inc.	Celina, OH
23	Elm St	0.769	\$5,020	John Schwaneman, Inc.	Celina, OH
24	Elm St	0.606	\$4,500	John Schwaneman, Inc.	Celina, OH
25	3760 Schwarz Rd	1.49	\$2,622.2	Robert D. McKinnon	Celina, OH
26	Elm St	1.994	\$13,900	John Schwaneman, Inc.	Celina, OH
27	Elm St	1.392	\$11,100	John Schwaneman, Inc.	Celina, OH
28	Elm St	1.000	\$3,340	John Schwaneman, Inc.	Celina, OH
29	3 Main St	1.000	\$3,340	John Schwaneman, Inc.	Celina, OH
30	3760 Schwarz Rd	2.276	\$13,203	Nancy Ann Chabre	Celina, OH
31	3760 Schwarz Rd	1.102	\$10,400	Charles L. and Mary F. Meyer	Celina, OH
32	5025 Schwarz Rd	0.29	\$70,800	Reed & Babcock, et al	Celina, OH
33	1101 US RT 127	21.23	\$902,813	Case Leasing & Rental, Inc.	Baltimore, MD

CROSS SECTIONS OF BEAVER CREEK (USED IN HEC-2 MODEL) WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC AND HYDRAULIC ANALYSIS, GRAND LAKE ST. MARTIN, AND LAKE AND BEAVER CREEKS, OHIO, FEBRUARY 7, 1960. ECOM ENGINEERING, INC., UNITED STATES DEPARTMENT OF AGRICULTURE, AERIAL PHOTOGRAPHY DATED JUNE 27, 1961.
 INFORMATION SHOWN IN THIS TABLE AND PROPERTY BOUNDARIES SHOWN ON THIS FIGURE WERE OBTAINED FROM THE WESPER COUNTY, OHIO REAL ESTATE SEARCH RESULTS, UNOFFICIAL REAL PROPERTY RECORD CARDS, COMPLETED ON DECEMBER 21, 2005.
 GRID AND BARRAGE ELEVATIONS WERE OBTAINED FROM THE OHIO 10 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EROSION CONTROL AND RIVERINE RESPONSE, 2004.



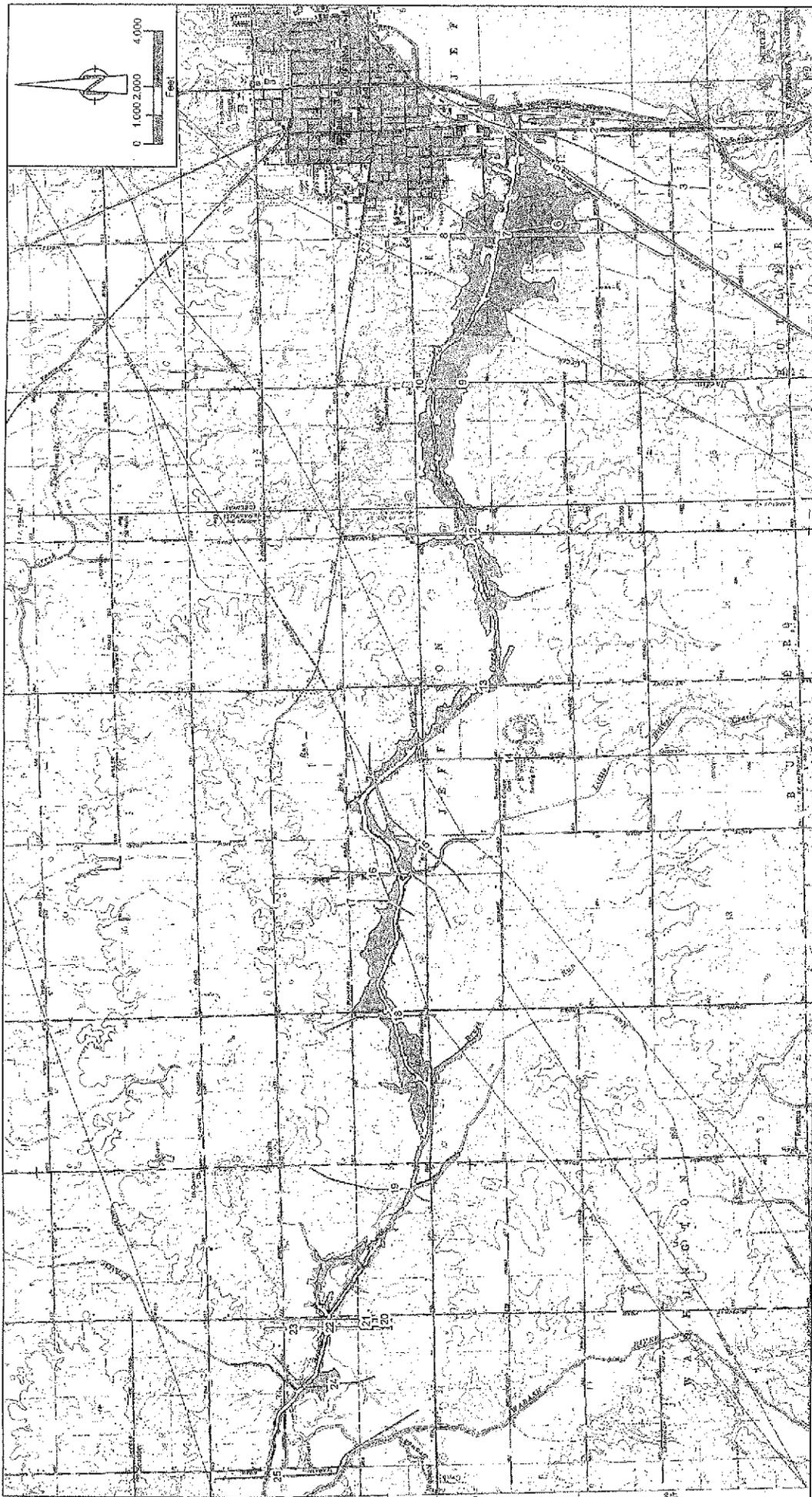


Figure 3a
MAY 1943 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS
 - USED IN HEC-2 COMPUTER PROGRAM
 - INUNDATED AREA AS THE RESULT OF THE 394 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

CROSS SECTIONS OF BEAVER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC INVESTIGATION OF BEAVER CREEK, SANDUSKY COUNTY, OHIO, PREPARED BY THE CHIEF ENGINEER, SANDUSKY COUNTY, OHIO, FEBRUARY 1, 1943. BEAVER CREEK, SANDUSKY COUNTY, OHIO, PREPARED BY THE CHIEF ENGINEER, SANDUSKY COUNTY, OHIO, FEBRUARY 1, 1943.

THE DATA FOR THE 1943 EVENT INDICATES THAT THE WATER SURFACE IN BEAVER CREEK AT THE UPRIGHT LEFT OF THE CAUSEWAY WOULD BE 500 FEET WIDE. THE CAUSEWAY COMPLEX SHOWN ON THIS MAP WAS NOT CONSTRUCTED UNTIL 1943. THE DATA FOR THE 1943 EVENT INDICATES THAT THE WATER SURFACE IN BEAVER CREEK AT THE UPRIGHT LEFT OF THE CAUSEWAY WOULD BE 500 FEET WIDE. THE CAUSEWAY COMPLEX SHOWN ON THIS MAP WAS NOT CONSTRUCTED UNTIL 1943. THE DATA FOR THE 1943 EVENT INDICATES THAT THE WATER SURFACE IN BEAVER CREEK AT THE UPRIGHT LEFT OF THE CAUSEWAY WOULD BE 500 FEET WIDE. THE CAUSEWAY COMPLEX SHOWN ON THIS MAP WAS NOT CONSTRUCTED UNTIL 1943.



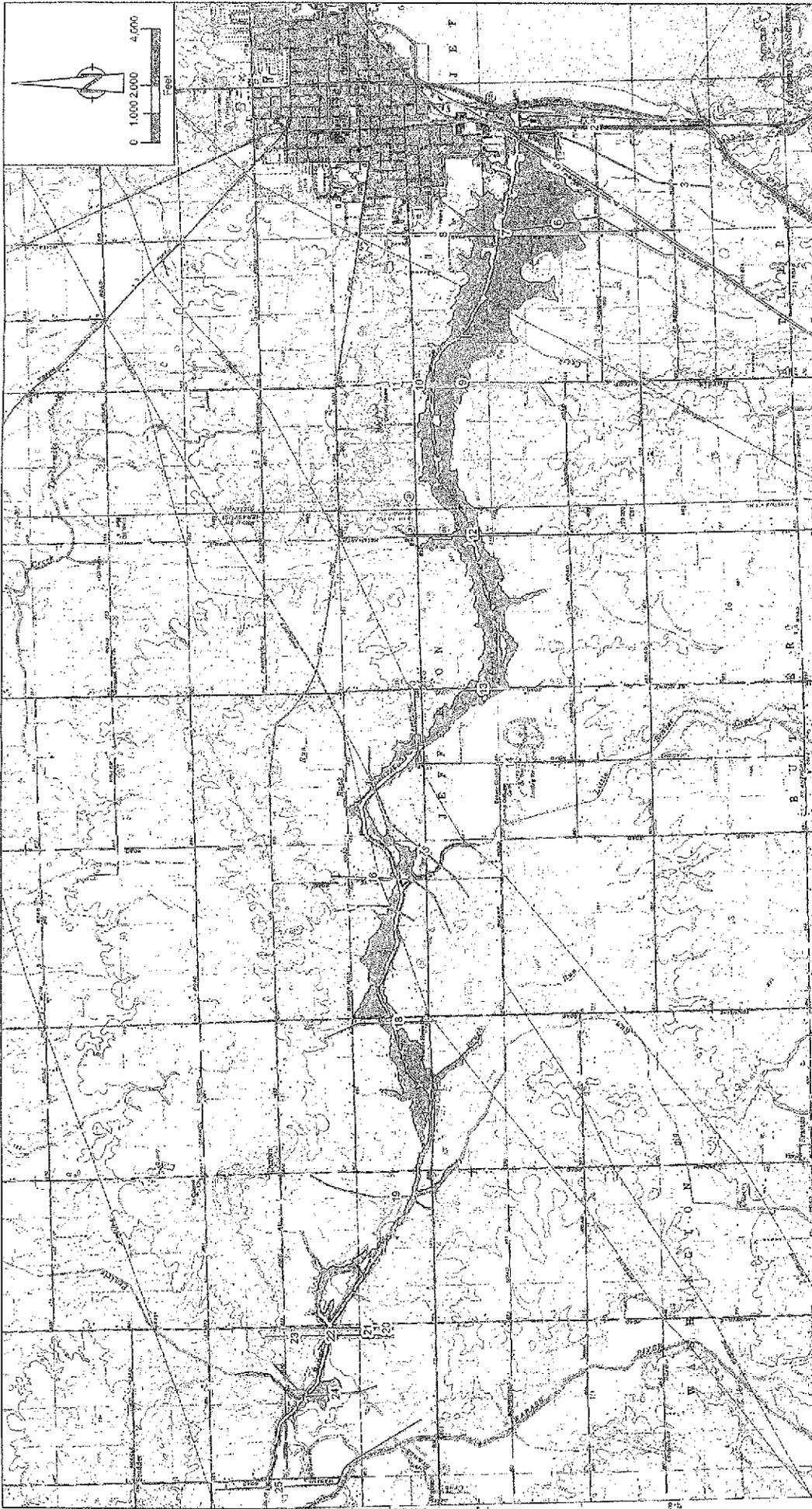


Figure 5a
JULY 1992 STORM EVENT
FLOOD INUNDATION MAP
 Schoofenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

CRASS SECTION OF BROWER USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC SURVEY AND ANALYSIS BY THE OHIO STATE UNIVERSITY CENTER FOR WATER RESOURCES, COLUMBUS, OHIO.

UNITED STATES GEOLOGICAL SURVEY NATIONAL WATER RESOURCES INSTITUTE, COLUMBUS, OHIO.

CRASS AND CROSS SECTION ELEVATIONS WERE OBTAINED FROM THE OHIO STATE UNIVERSITY CENTER FOR WATER RESOURCES, COLUMBUS, OHIO.

THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2004.



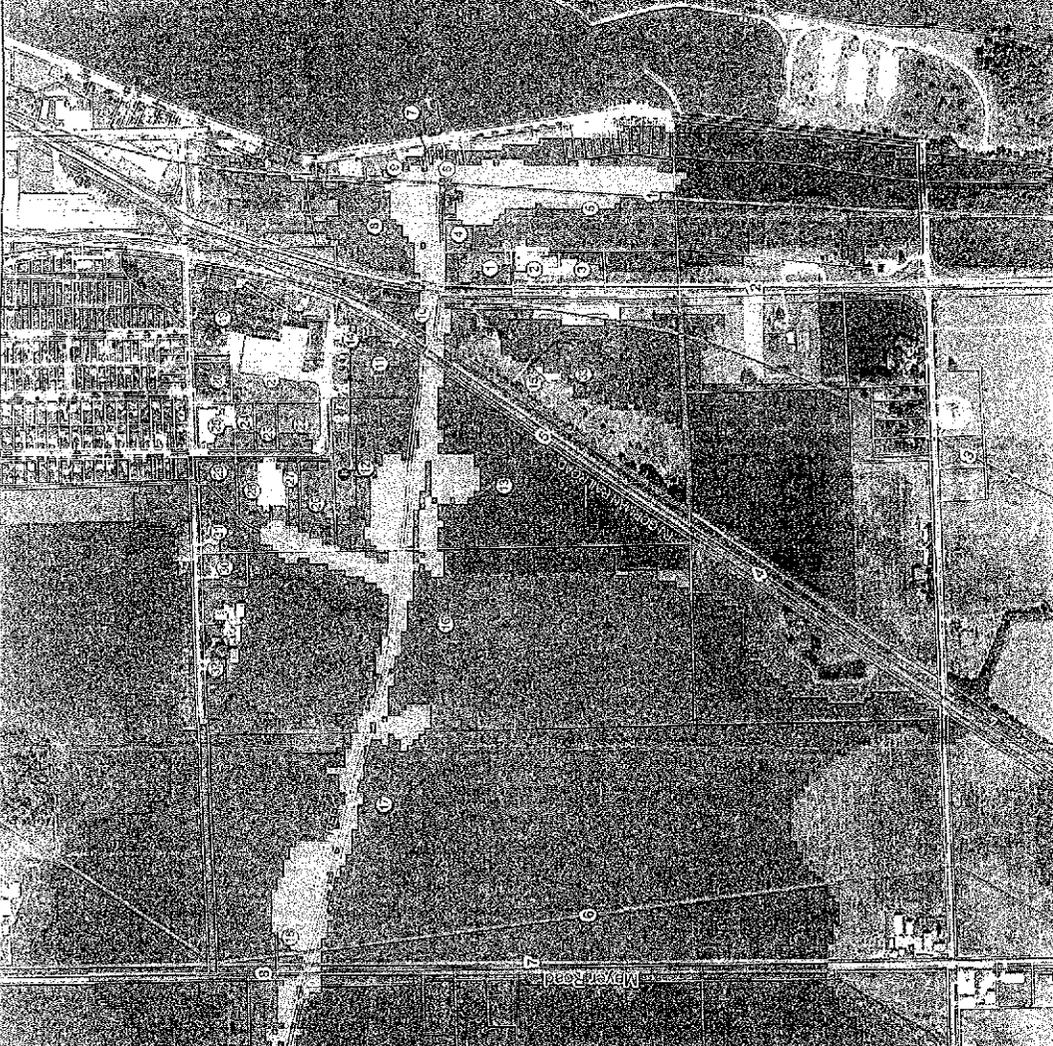
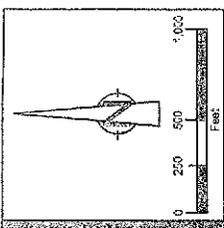


Figure 5b
JULY 1992 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - PROPERTY BOUNDARIES
 - UNINUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - UNINUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
 - ① PROPERTY IDENTIFICATION NUMBER

ID No.	Address	Acres ¹	Appraised Value	Owner	Owner Location
1	1152 E. 11th St.	2.5	\$137,500	West Lake Development, L.L.C.	Columbus, OH
2	1152 E. 11th St.	2.5	\$137,500	West Lake Development, L.L.C.	Columbus, OH
3	US RT 127	1.546	\$105,400	20th Century Properties, Inc.	Wapakoneta, OH
4	US RT 127	0.681	\$39,440	Neil Elmer	St. Henry, OH
5	US RT 127	11.294	\$481,340	Plant Law Development, L.L.C.	Columbus, OH
6	West Bank Rd.	0.717	\$7,200	DOHS	Columbus, OH
7	West Bank Rd.	3	\$1,510	DOHS	Columbus, OH
8	6211 11th St.	6.5	\$12,500	City of Columbus	Columbus, OH
9	1531 11th St.	6.5	\$12,500	City of Columbus	Columbus, OH
10	US RT 127	6.92	\$5,200	Monroe Contractors	Columbus, OH
11	Schumack Rd.	2.94	\$16,480	City of Columbus	Columbus, OH
12	Schumack Rd.	5.15	\$27,661,270	Church & Miller	Columbus, OH
13	Monroe Rd.	15.77	\$93,160	Church & Miller	Columbus, OH
14	31 Men St.	2.85	\$13,200	Merger County Commissioners	Columbus, OH
15	31 Men St.	2.85	\$13,200	Merger County Commissioners	Columbus, OH
16	US RT 127	1.5	\$11,110	City of Columbus	Columbus, OH
17	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
18	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
19	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
20	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
21	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
22	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
23	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
24	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
25	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
26	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
27	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
28	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
29	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
30	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
31	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
32	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH
33	Monroe Rd.	16.57	\$11,110	City of Columbus	Columbus, OH

PROFESSIONAL ENGINEER USED IN THIS MODEL WERE OBTAINED FROM THE FINAL REPORT AND APPROPRIATE HYDRAULIC ANALYSIS, GRAND LAKE ET PARKS, AUGUSTA AND MERCER COUNTIES, OHIO, FEBRUARY 1984, DEAN ENGINEERING, INC. UNITED STATES DEPARTMENT OF AGRICULTURE, FEDERAL PHOTOGRAPHIC BUREAU, DATE 28, 1981. CHARTERED SURVEYOR IN THE STATE OF OHIO AND PROPERTY SURVEYOR IN THE STATE OF OHIO. THE SURVEY WAS OBTAINED FROM THE SURVEYOR'S COUNTY RECORD, EAST STATE SURVEY, UICORP, NSAL PROPERTY RECORDS, COMPLETED ON DECEMBER 11, 2002. GEOMATIC SURFACE ELEVATIONS WERE OBTAINED FROM THE Ohio 10 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE Ohio ENVIRONMENTAL PROTECTION AGENCY DIVISION OF ENVIRONMENTAL AND RECREATION, 2004.



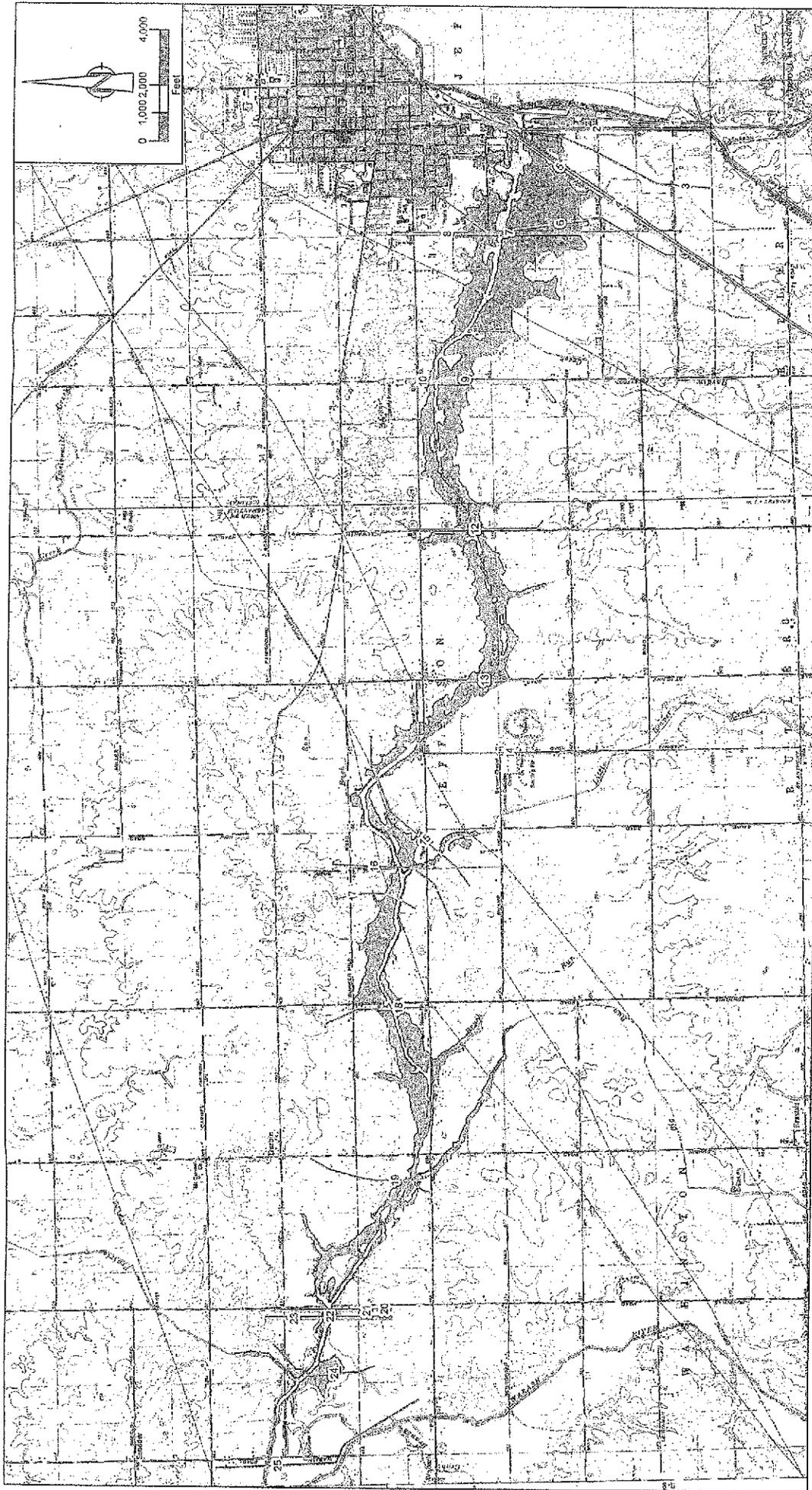


Figure 6a
JUNE / JULY 1993 STORM EVENT
FLOOD INUNDATION MAP
 Schotterstein Zox & Durrn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - ▨ INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - ▩ INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

CROSS SECTIONS OF BEAVER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE STATE REPORT HYDROLOGIC AND HYDRAULIC ANALYSES, GRAND JAWE CREEK, WATERS, AUBURN AND MIDDLE COUNTRIES, OHIO, FEBRUARY 7, 1991, DODGE ENGINEERING, INC.

UNITED STATES GEOLOGICAL SURVEY DIGITAL ELEVATION DATA (DEM) FROM THE STATE REPORT HYDROLOGIC AND HYDRAULIC ANALYSES, GRAND JAWE CREEK, WATERS, AUBURN AND MIDDLE COUNTRIES, OHIO, FEBRUARY 7, 1991, DODGE ENGINEERING, INC.

GROUND SURFACE ELEVATIONS USED IN HEC-2 MODEL WERE OBTAINED FROM THE STATE REPORT HYDROLOGIC AND HYDRAULIC ANALYSES, GRAND JAWE CREEK, WATERS, AUBURN AND MIDDLE COUNTRIES, OHIO, FEBRUARY 7, 1991, DODGE ENGINEERING, INC.



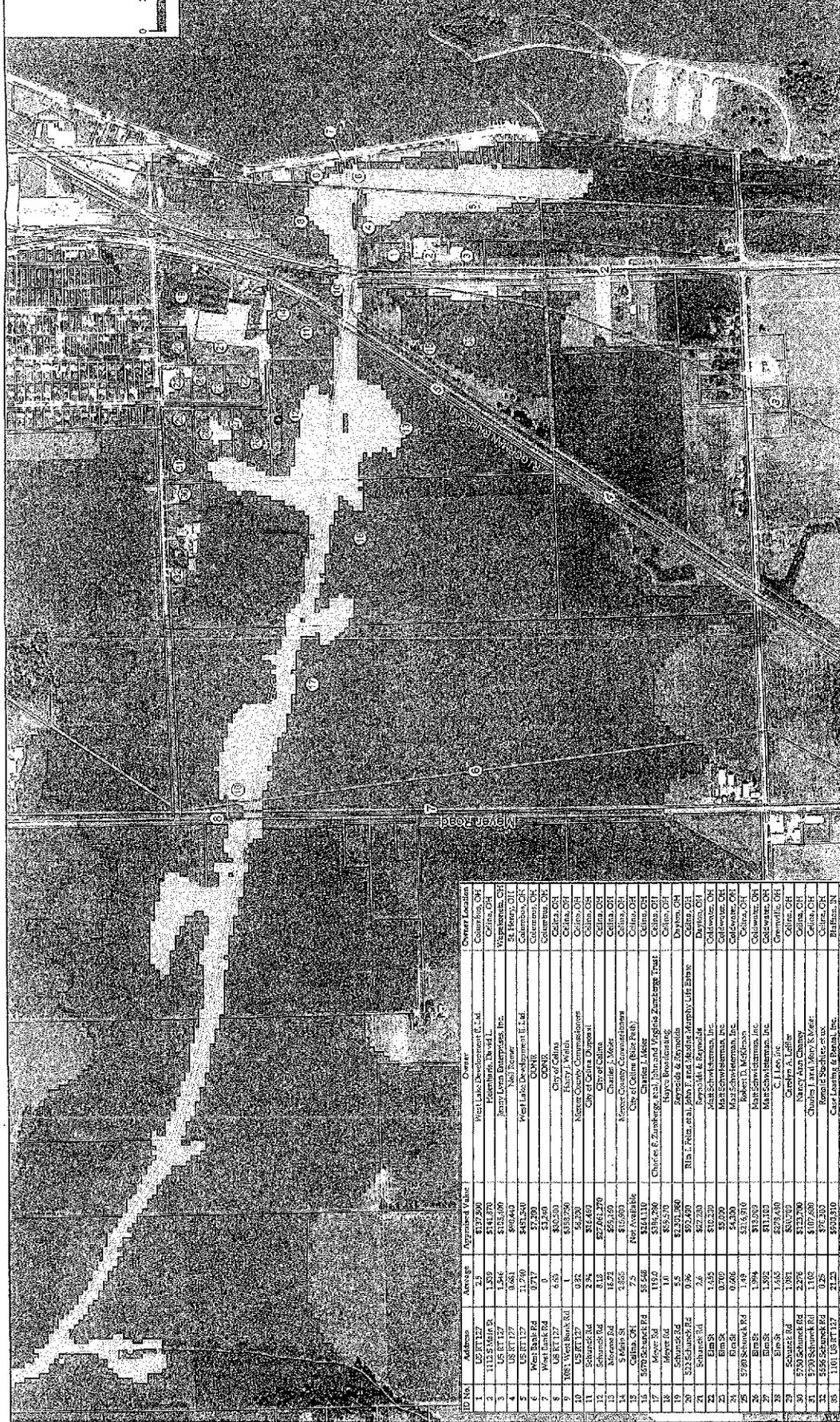


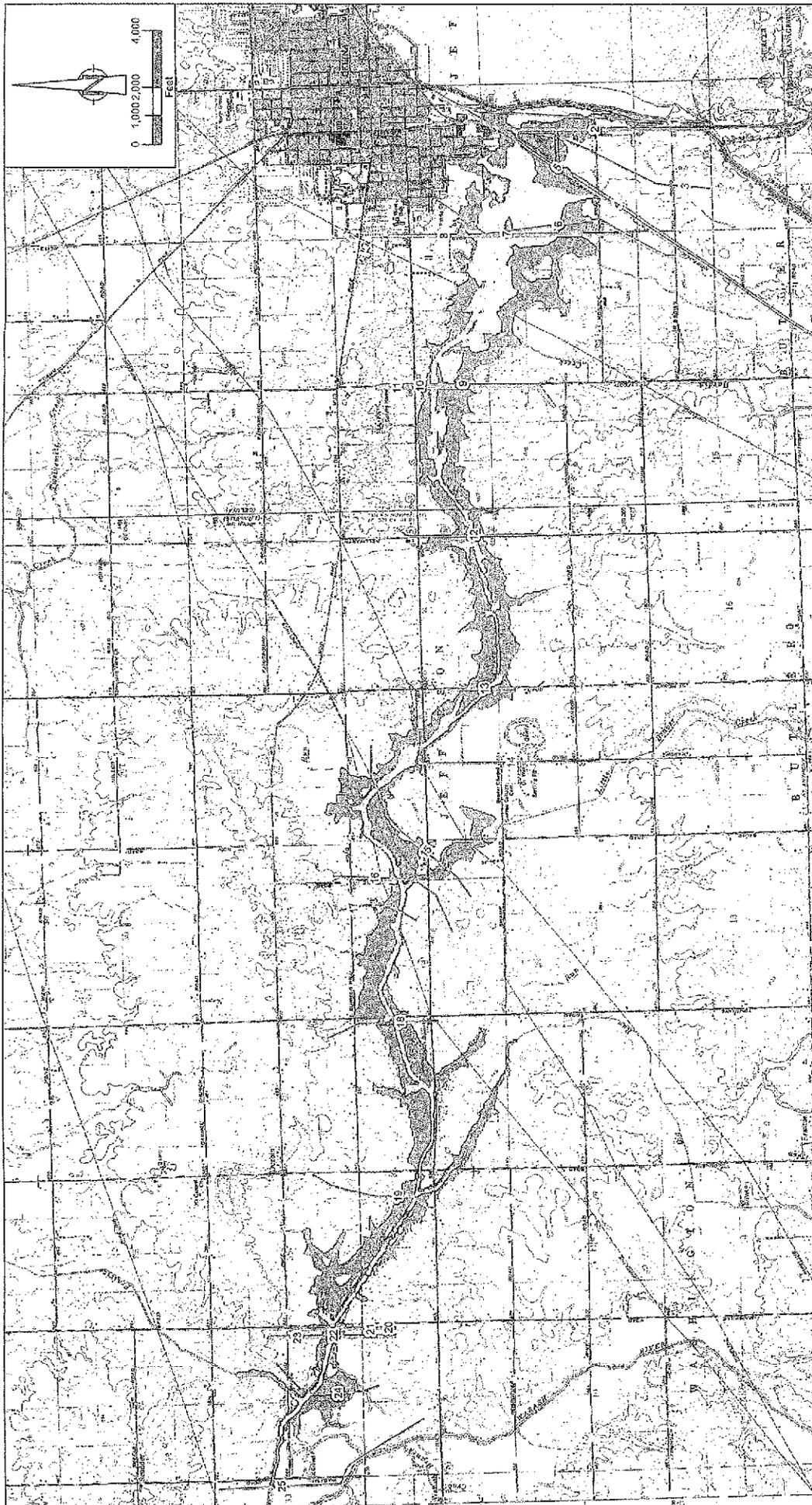
Figure 6b
JUNE / JULY 1993 STORM EVENT
FLOOD INUNDATION MAP
Schootenstein Zox & Dunn Co., LPA
Columbus, Ohio

ID No.	Address	Average	Aggravated Value	Owner	Owner Location
1	US RT 127	2.5	\$172,500	West Lake Development Co. Ltd.	Columbus, OH
2	1115 S. Main St.	1.52	\$14,770	Edenburgh, Inc. d/b/a I.	Columbus, OH
3	US RT 127	1.54	\$15,300	Janey Lynn Enterprises, Inc.	Wapakoneta, OH
4	US RT 127	0.61	\$9,040	John Jones	St. Henry, OH
5	West Lake Development Co. Ltd.	0.21	\$3,000	West Lake Development Co. Ltd.	Columbus, OH
6	West Bank Rd.	0	\$0	GOING	Columbus, OH
7	US RT 127	6.25	\$83,000	City of Columbus	Columbus, OH
8	1081 West Bank Rd.	1	\$18,750	Hasty, J. Melch	Columbus, OH
9	US RT 127	0.82	\$5,200	Reiner County Commissioners	Columbus, OH
10	Schwanck Rd.	2.94	\$32,400	City of Columbus	Columbus, OH
11	Yonkers Rd.	11.71	\$132,000	City of Columbus	Columbus, OH
12	Yonkers Rd.	11.71	\$132,000	City of Columbus	Columbus, OH
13	S. Main St.	2.85	\$32,400	Reiner County Commissioners	Columbus, OH
14	US RT 127	2.5	\$172,500	City of Columbus	Columbus, OH
15	6770 Schwanck Rd.	55.548	\$641,110	Charles E. Zantberg, Inc. and Virginia Zantberg Trust	Columbus, OH
16	Major Rd.	19.0	\$216,250	Hoyts Broadcasting	Columbus, OH
17	Major Rd.	1.0	\$5,250	Hoyts Broadcasting	Columbus, OH
18	Schwanck Rd.	0.5	\$2,375	James B. Zantberg	Columbus, OH
19	Schwanck Rd.	0.5	\$2,375	James B. Zantberg	Columbus, OH
20	Schwanck Rd.	2.4	\$27,250	James B. Zantberg	Columbus, OH
21	Schwanck Rd.	2.4	\$27,250	James B. Zantberg	Columbus, OH
22	East St.	1.65	\$18,250	John Schootenstein, Inc.	Columbus, OH
23	East St.	0.70	\$8,200	John Schootenstein, Inc.	Columbus, OH
24	East St.	0.60	\$4,300	John Schootenstein, Inc.	Columbus, OH
25	7798 Schwanck Rd.	1.49	\$16,910	Robert D. McKinnon	Columbus, OH
26	East St.	1.94	\$21,250	John Schootenstein, Inc.	Columbus, OH
27	East St.	1.92	\$21,100	John Schootenstein, Inc.	Columbus, OH
28	East St.	1.81	\$20,700	John Schootenstein, Inc.	Columbus, OH
29	Schwanck Rd.	1.81	\$20,700	John Schootenstein, Inc.	Columbus, OH
30	1730 Schwanck Rd.	2.23	\$25,200	John Schootenstein, Inc.	Columbus, OH
31	1730 Schwanck Rd.	1.10	\$12,600	John Schootenstein, Inc.	Columbus, OH
32	1555 Schwanck Rd.	0.25	\$2,625	Born & Spahr, Inc.	Columbus, OH
33	1555 Schwanck Rd.	0.25	\$2,625	Born & Spahr, Inc.	Columbus, OH
34	1555 Schwanck Rd.	21.2	\$233,110	Born & Spahr, Inc.	Columbus, OH
35	1555 Schwanck Rd.	21.2	\$233,110	Born & Spahr, Inc.	Columbus, OH

CROSS SECTIONS OF BEAVER CREEK USED IN BECA MODEL WERE OBTAINED FROM THE FINAL REPORT "HYDROLOGIC AND HYDRAULIC ANALYSIS OF BEAVER CREEK AT MAINTENANCE AND MEADOW LOCATIONS, CHIO, FEBRUARY 2, 1984, BECA ENGINEERING, INC. UNITED STATES DEPARTMENT OF AGRICULTURE, AERIAL PHOTOGRAPHY DATED APRIL 23, 1984. INFORMATION SHOWN IN THIS TABLE AND PROPERTY BOUNDARIES SHOWN ON THIS FIGURE WERE OBTAINED FROM THE MEADOW COUNTY, OHIO REAL ESTATE SEARCH RECORDS. UNOFFICIAL REAL PROPERTY RECORDS COMPLETED ON DECEMBER 31, 2003. GROUND SURFACE ELEVATIONS WERE OBTAINED FROM THE CHIO 10 METER DIGITAL ELEVATION MODEL, FILE 8-140 BY THE CHIO ENVIRONMENTAL PROTECTION AGENCY (EPA) OF BIRDS, OPEN SPACE, AND RECREATION (BOSPAR) 2004.

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS
 - USED IN HEC-2 COMPUTER PROGRAM
 - PROPERTY BOUNDARIES
 - INUNDATED AREA AS THE RESULT OF THE 38.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
 - ① PROPERTY IDENTIFICATION NUMBER





LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
- ▨ INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
- ▩ INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

Figure 7a
JUNE / JULY 2003 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

CROSS SECTIONS OF BEAVER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC AND HYDRAULIC ANALYSIS OF GRAND JAZZ BY WATTS AUGLIZE AND MEMBER COMPANIES, CINC.
 PROPERTY OF WATTS AUGLIZE AND MEMBER COMPANIES, CINC.
 THE U.S. OFFICE OF INFORMATION TECHNOLOGY SERVICES
 CROSS SECTION ELEVATIONS WERE OBTAINED FROM THE U.S. OFFICE OF INFORMATION TECHNOLOGY SERVICES. PUBLISHED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, ZOX



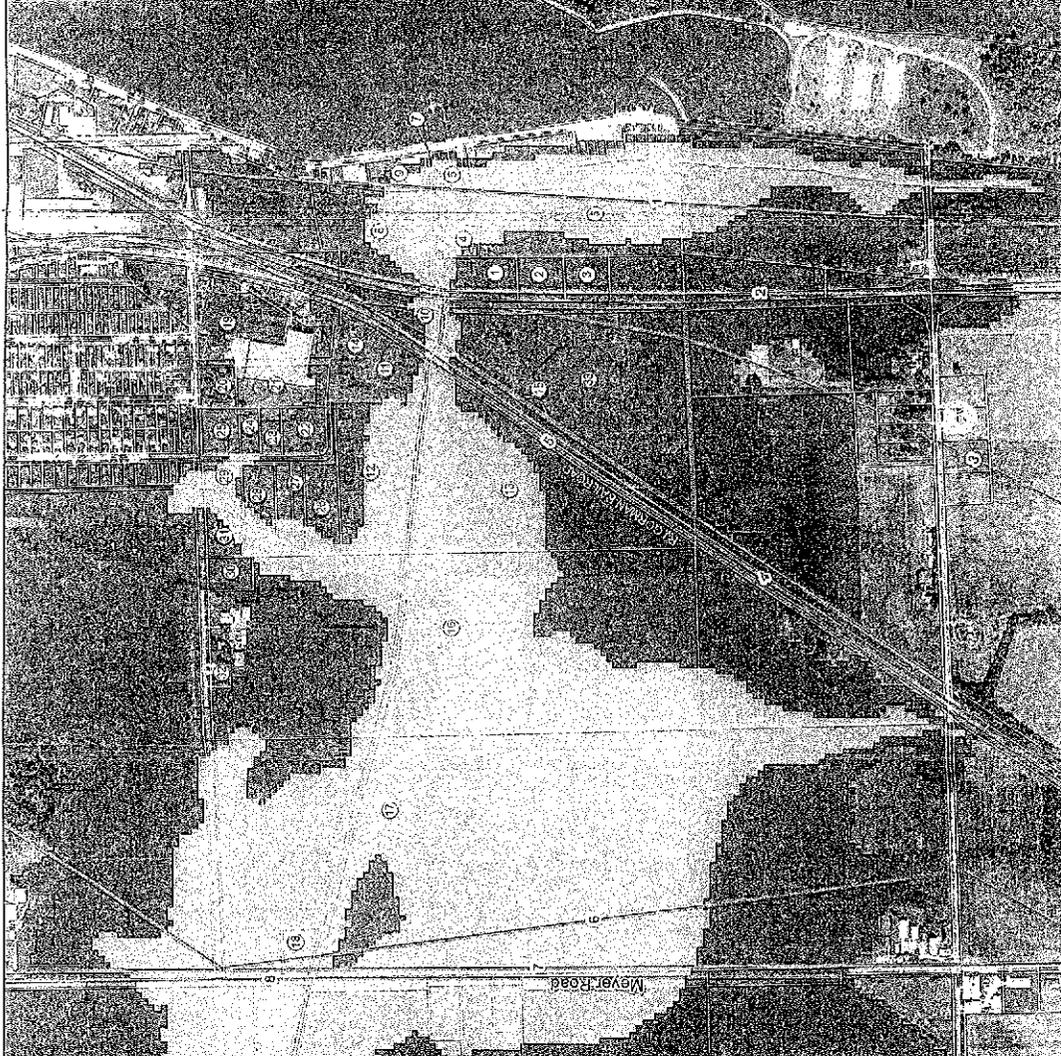
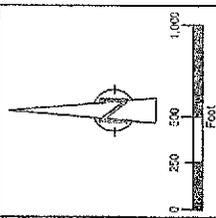


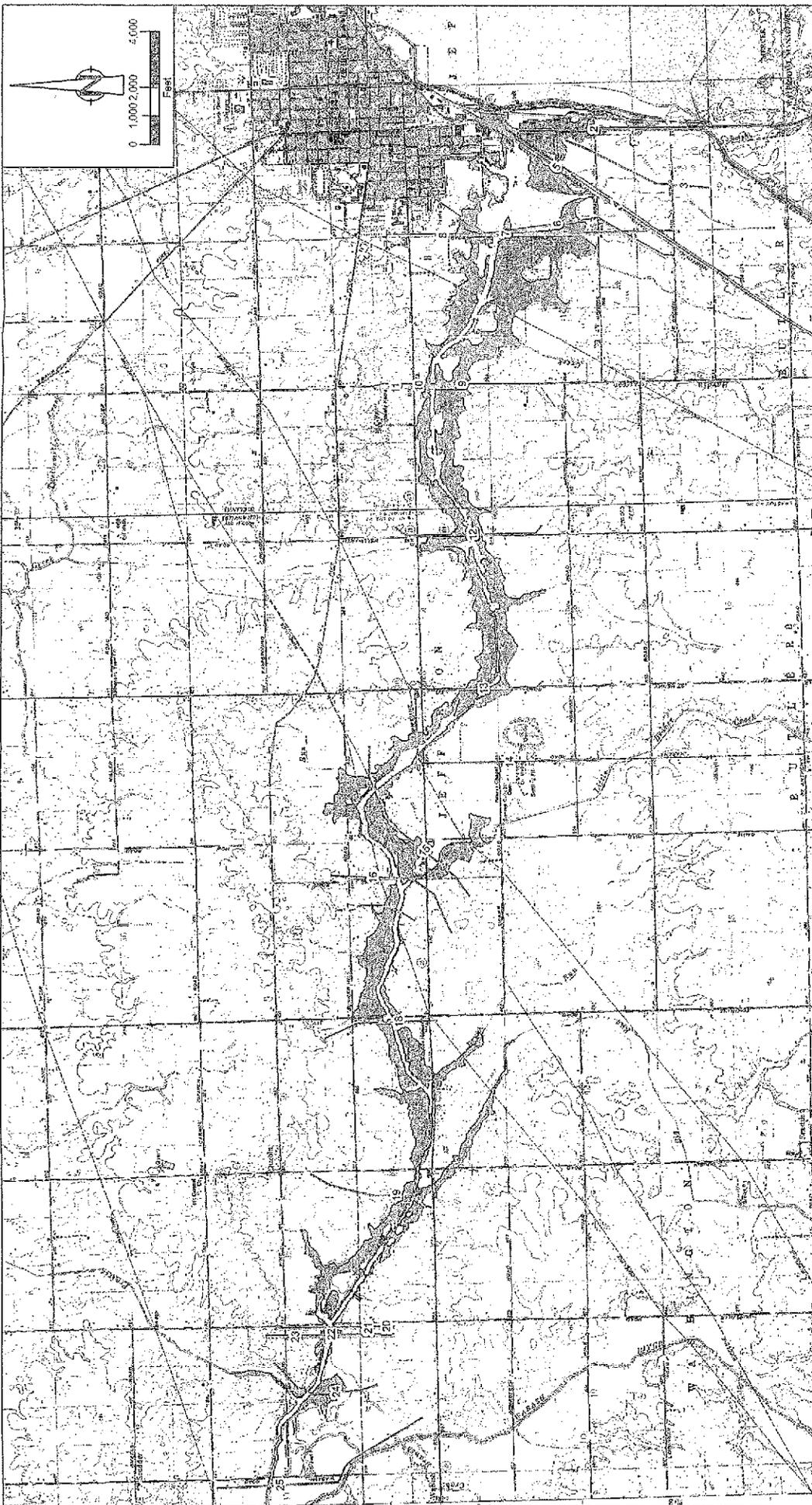
Figure 7b
JUNE / JULY 2003 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - PROPERTY BOUNDARIES
 - INUNDATED AREA AS THE RESULT OF THE 38.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
 - PROPERTY IDENTIFICATION NUMBER

ID No.	Address	Assessor	Appraised Value	Owner	Owner Location
1	US 51 127	2.5	\$137,500	West Lake Development II, Ltd.	Columbus, OH
2	11178 Main St.	1.539	\$141,870	Haberstadt, David L.	Columbus, OH
3	US 51 127	1.546	\$102,430	Jenny Lynn Enterprises, Inc.	Wapakoneta, OH
4	US 51 127	9.851	\$89,446	Nel Noner	St. Henry, OH
5	US 51 127	17.740	\$451,830	West Lake Development II, L.P.	Columbus, OH
6	West Bank Rd.	0.717	\$7,350	CDNR	Columbus, OH
7	US 51 127	6.53	\$50,500	Shiva, Colina	Columbus, OH
8	1051 West Bank Rd.	1	\$155,750	Haven, Victoria	Columbus, OH
9	US 51 127	0.32	\$6,200	Knox County Commissioner	Columbus, OH
10	Schurck Rd.	2.94	\$76,450	City of Columbus	Columbus, OH
11	Schurck Rd.	8.13	\$27,602,770	City of Columbus	Columbus, OH
12	Schurck Rd.	13.72	\$59,180	Charles T. Meyer	Columbus, OH
13	McIntosh Rd.	7.5	\$75,520	Metro County Commissioners	Columbus, OH
14	US 51 127	1.0	\$22,800	City of Columbus	Columbus, OH
15	US 51 127	28.443	\$156,115	Charles A. Meier	Columbus, OH
16	8670 Schurck Rd.	317.3	\$334,260	Charles F. Zumborg et al. East and Virginia Zumborg Trust	Columbus, OH
17	Meyer Rd.	1.0	\$53,270	Hoyce Brownstein	Columbus, OH
18	Meyer Rd.	1.0	\$53,270	Reynolds & Reynolds	Columbus, OH
19	Schurck Rd.	5.5	\$2,971,580	Flin E. Miller et al. John F. and Marsha Murphy Life Trust	Columbus, OH
20	592 Schurck Rd.	0.76	\$22,400	Reynolds & Reynolds	Columbus, OH
21	Schurck Rd.	2.6	\$22,250	Reynolds & Reynolds	Columbus, OH
22	Schurck Rd.	0.76	\$22,250	Reynolds & Reynolds	Columbus, OH
23	Elm St.	0.203	\$5,000	Matt Schweneman, Inc.	Columbus, OH
24	Elm St.	0.605	\$6,200	Matt Schweneman, Inc.	Columbus, OH
25	5780 Schurck Rd.	1.49	\$716,910	Robert D. McLerran	Columbus, OH
26	Elm St.	1.551	\$3,800	Matt Schweneman, Inc.	Columbus, OH
27	Elm St.	1.592	\$11,100	Matt Schweneman, Inc.	Columbus, OH
28	Elm St.	1.465	\$271,480	C. L. Lee, Inc.	Columbus, OH
29	Schurck Rd.	1.181	\$31,700	Cherlyn A. Deiter	Columbus, OH
30	US 51 127	1.181	\$31,700	Nancy J. Deiter	Columbus, OH
31	5710 Schurck Rd.	1.102	\$107,430	Cherlyn A. Deiter	Columbus, OH
32	5655 Schurck Rd.	0.25	\$70,800	Ronald D. Deiter et al.	Columbus, OH
33	1301 US 51 127	71.25	\$20,630	Case Leasing & Rental, Inc.	Bluffton, SC

CROSS SECTIONS OF SPILLWAY CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT (HYDROLOGICAL AND HYDRAULIC ANALYSIS, GRAND LAKE ST. MARYR, AUGUSTA AND MICHIGAN COUNTIES, OHIO, FEBRUARY 2, 1992) BY C&E ENGINEERING, INC. UNITED STATES DEPARTMENT OF AGRICULTURAL FEDERAL INFORMATION PROGRAM DATED JUNE 23, 1984. INFORMATION SHOWN IN THIS TABLE AND PROPERTY BOUNDARIES SHOWN ON THIS FIGURE WERE OBTAINED FROM THE MICHIGAN COUNTY, OHIO REAL ESTATE SEARCH RESULTS, UNOFFICIAL REAL PROPERTY RECORD CARDS, COMPLETED ON DECEMBER 21, 2006. EXISTING SUBGRADE ELEVATIONS USED WERE OBTAINED FROM THE OHIO 10 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF SURVEY AND MAPPING, RESPONSE NUMBER 2006.





LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
- INUNDATED AREA AS THE RESULT OF THE 38.4 FOOT SPILLWAY
- INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

Figure 8a
DECEMBER 2003 STORM EVENT
FLOOD INUNDATION MAP
Schottenstein Zox & Dunn Co., LPA
Columbus, Ohio

CROSS-SECTIONS OF BEAVER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC STUDY OF BEAVER CREEK, WASHINGTON, A. ROUZE AND HERBERT COUNTY, OHIO, FEBRUARY 7, 1994, P. 202-204. SPILLWAY DATA WERE OBTAINED FROM THE UNITED STATES GEOLOGICAL SURVEY'S DIGITAL SPILLWAY DATABASE (DSD) AND IS DOWNLOADED FROM THE GAO OFFICE OF INFORMATION TECHNOLOGY WEBSITE. CROSS-SECTION ELEVATIONS WERE OBTAINED FROM THE OHIO HYDROLOGICAL INFORMATION SYSTEM, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2010.



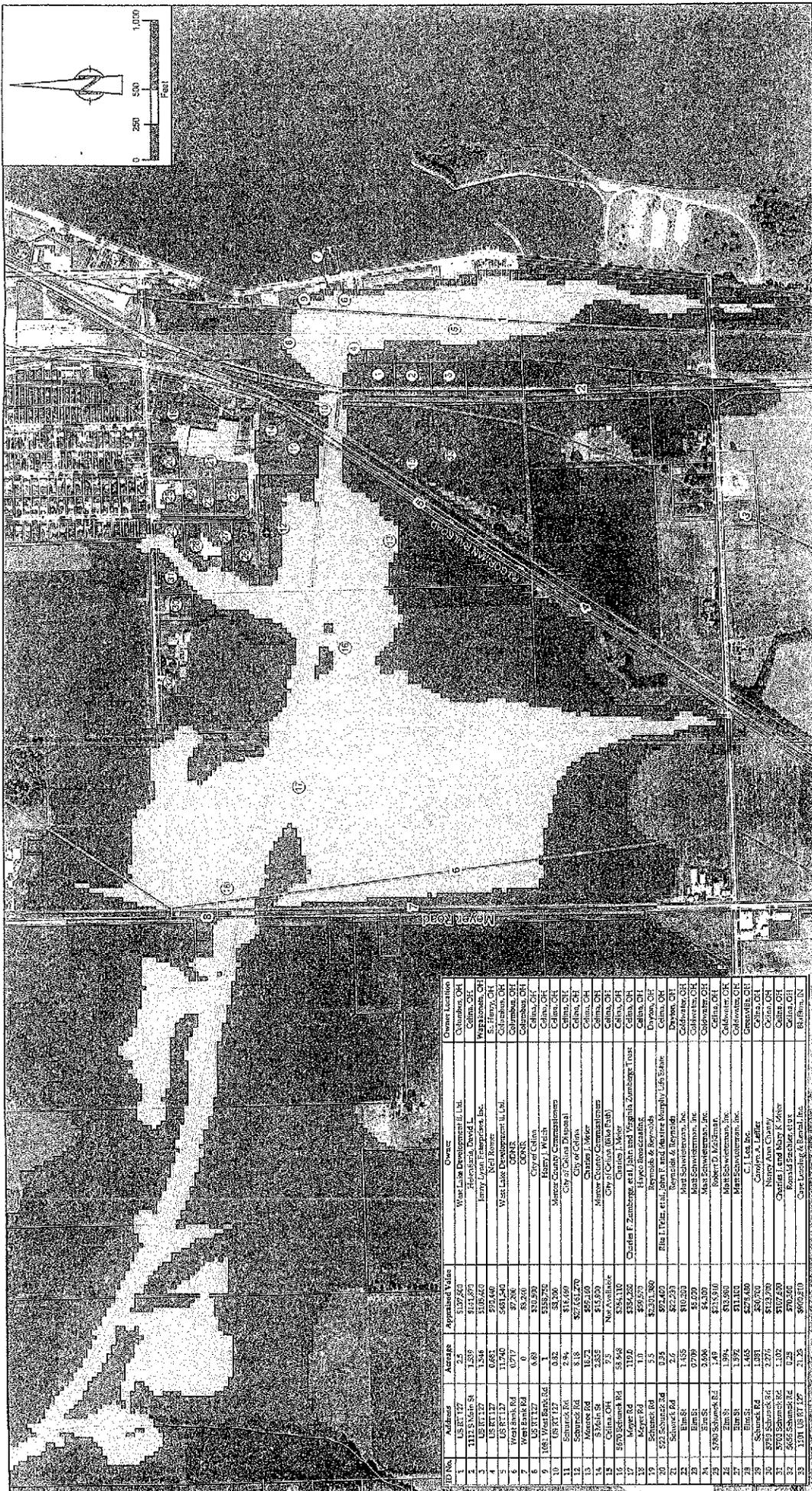
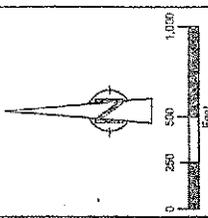


Figure 8b
DECEMBER 2003 STORM EVENT
FLOOD INUNDATION MAP
Schottenstein Zox & Dunn Co., LPA
Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - PROPERTY BOUNDARIES
 - INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
 - PROPERTY IDENTIFICATION NUMBER

ID No.	Address	Acres	Approximate Value	Owner	Owner's Location
1	US 81 127	2.55	\$17,240	Wain Law Development, L.L.C.	Columbus, OH
2	US 81 127	1.584	\$10,640	Wain Law Development, L.L.C.	Columbus, OH
3	US 81 127	1.584	\$10,640	Wain Law Development, L.L.C.	Columbus, OH
4	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
5	US 81 127	11.740	\$41,240	Wain Law Development, L.L.C.	Columbus, OH
6	West Bank Rd	0.717	\$7,206	COVAR	Columbus, OH
7	West Bank Rd	0	\$3,200	COVAR	Columbus, OH
8	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
9	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
10	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
11	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
12	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
13	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
14	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
15	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
16	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
17	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
18	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
19	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
20	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
21	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
22	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
23	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
24	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
25	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
26	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
27	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
28	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
29	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
30	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
31	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
32	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
33	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
34	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
35	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
36	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
37	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
38	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
39	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
40	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
41	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
42	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
43	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
44	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
45	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
46	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
47	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
48	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
49	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH
50	US 81 127	0.887	\$9,240	Wain Law Development, L.L.C.	Columbus, OH

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 UNITED STATES DEPARTMENT OF AGRICULTURE, AERIAL PHOTOGRAPHY DATED: JUNE 13, 2004.
 APPROVED FOR RELEASE BY THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION ON FEBRUARY 2, 1994. ORIGINAL SOURCE: SCHOTTENSTEIN ZOX & DUNN CO., LPA.
 APPROVED FOR RELEASE BY THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION ON FEBRUARY 2, 1994. ORIGINAL SOURCE: SCHOTTENSTEIN ZOX & DUNN CO., LPA.
 APPROVED FOR RELEASE BY THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION ON FEBRUARY 2, 1994. ORIGINAL SOURCE: SCHOTTENSTEIN ZOX & DUNN CO., LPA.
 APPROVED FOR RELEASE BY THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION ON FEBRUARY 2, 1994. ORIGINAL SOURCE: SCHOTTENSTEIN ZOX & DUNN CO., LPA.



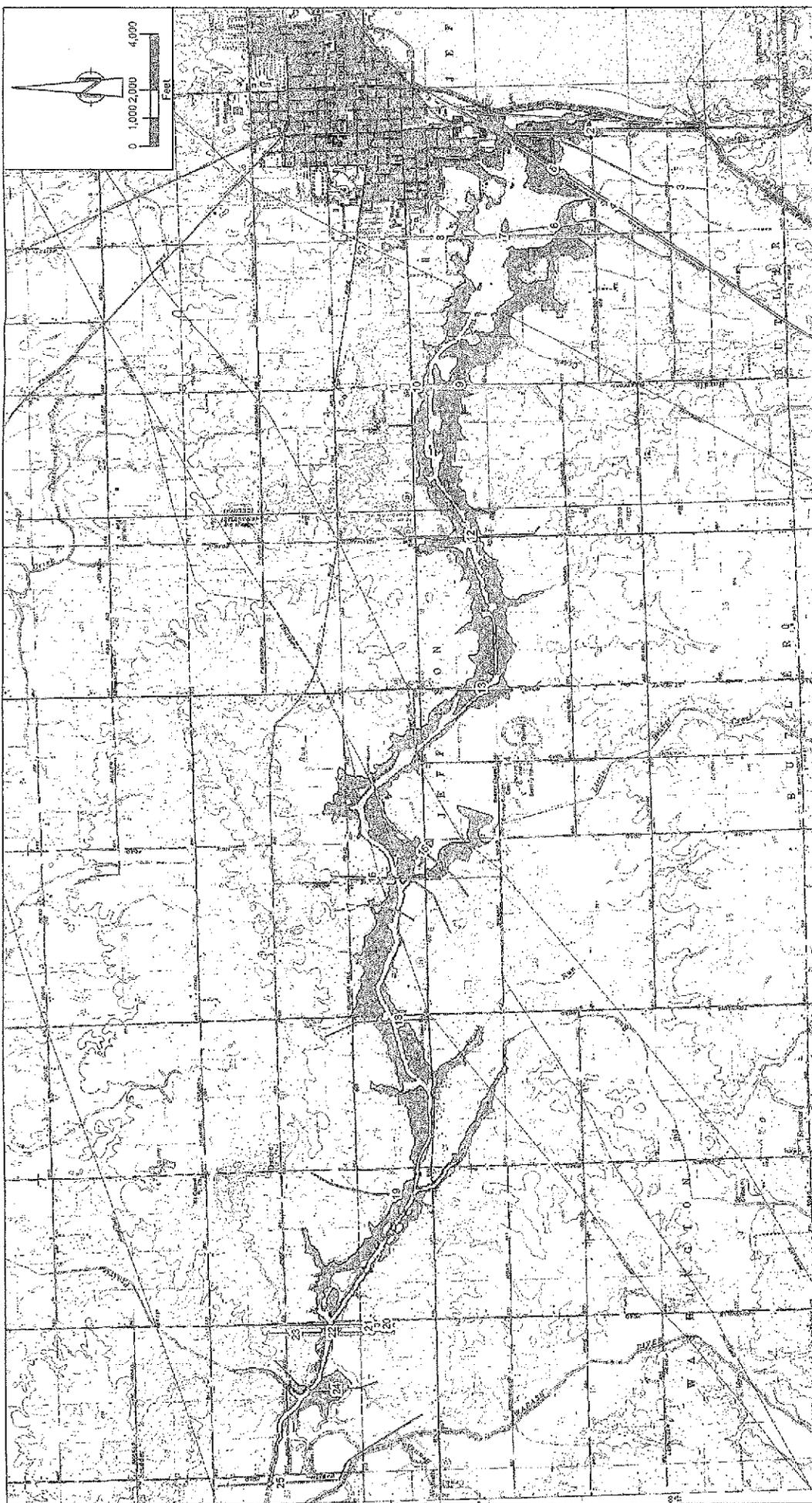


Figure 9a
JANUARY 2005 STORM EVENT
FLOOD INUNDATION MAP
 Schottenstein Zox & Dunn Co., LPA
 Columbus, Ohio

- LEGEND**
- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
 - CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
 - INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
 - INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY

CROSS SECTIONS OF BOWER CREEK USED IN HEC-2 MODEL WERE OBTAINED FROM THE PAUL REPORT HYDROLOGIC INVESTIGATION OF BOWER CREEK, WALKER, ANDERSON AND BERGER COUNTIES, OHIO, FEBRUARY 2, 1959, BROWN ENGINEERING, INC.

UNITED STATES GEOLOGICAL SURVEY DIGITAL WATER GRAPHICS (DSNWA) SPATIAL DATA OBTAINED FROM THE OHIO OFFICE OF INFORMATION TECHNOLOGY SERVICE

GROUND SURFACE ELEVATIONS USED WERE OBTAINED FROM THE OHIO STATE DIGITAL ELEVATION MODEL, PUBLISHED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF EMERGENCY AND REMEDIAL RESPONSE, 2000



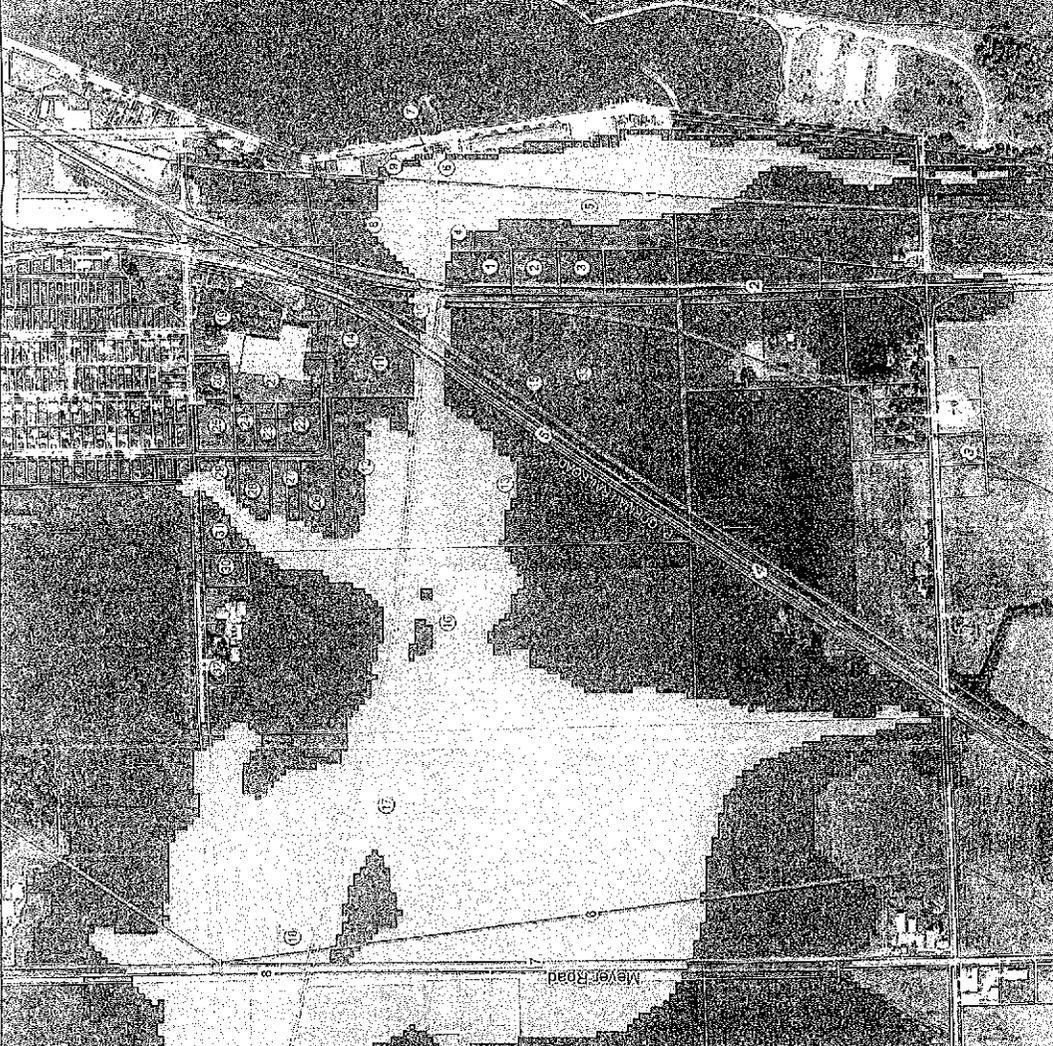
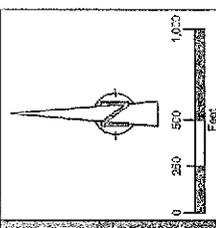


Figure 9b
JANUARY 2005 STORM EVENT
FLOOD INUNDATION MAP
Schoffterstein Zox & Dunn Co., LPA
Columbus, Ohio

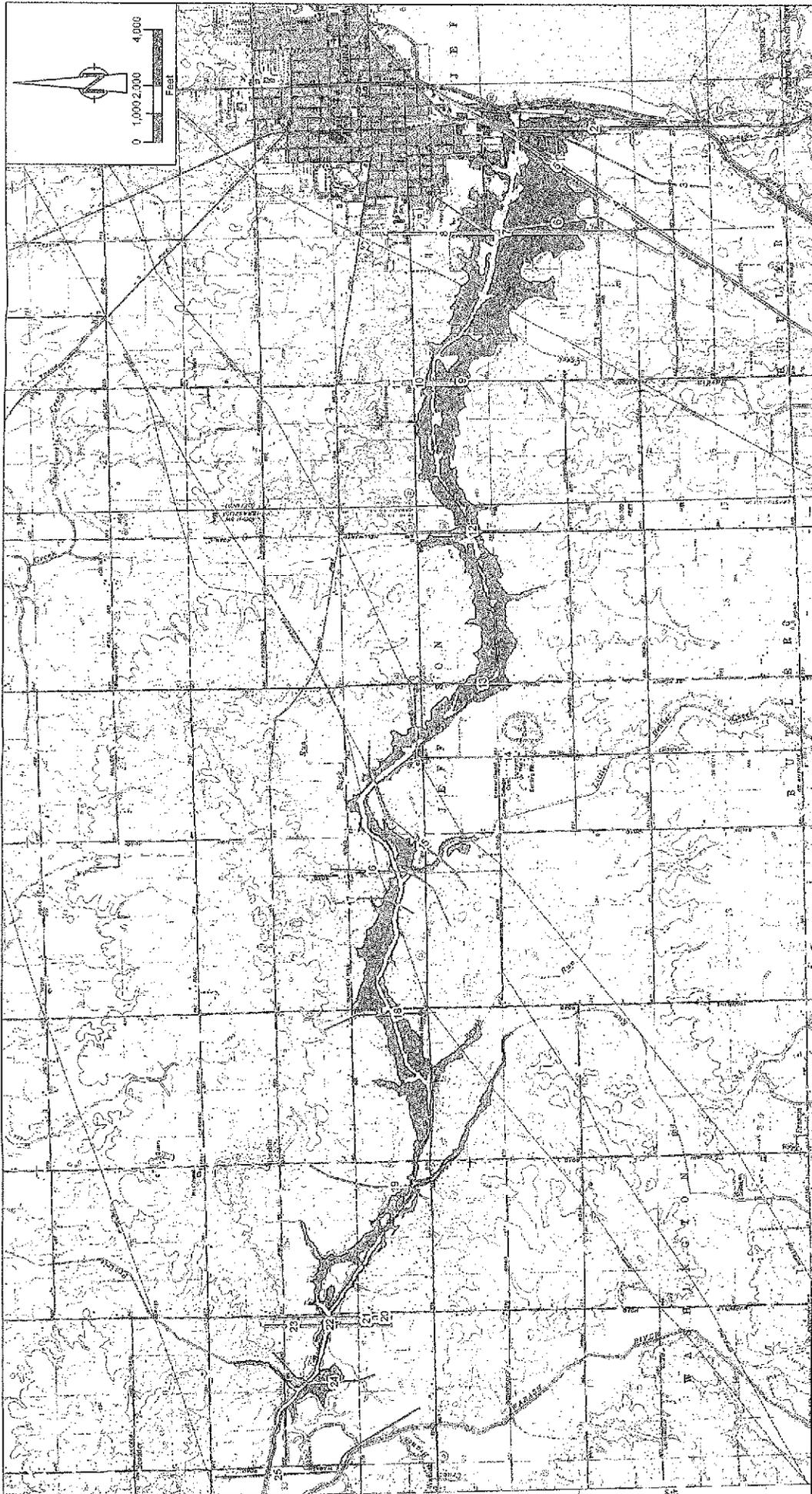
ID No.	Address	Assessing	Owner	Owner Location
1	US RT 127	2.5	High Line Development & Ltd.	Columbus, OH
2	145 RT 127	1.34	High Line Development & Ltd.	Wapakoneta, OH
3	145 RT 127	1.34	High Line Development & Ltd.	Wapakoneta, OH
4	US RT 127	0.61	Nell Rowser	St. Henry, OH
5	US RT 127	11.740	West Lake Development & Ltd.	Columbus, OH
6	West Bank Rd	0.717	OOHR	Columbus, OH
7	West Bank Rd	0	OOHR	Columbus, OH
8	US RT 127	6.2	City of Columbus	Columbus, OH
9	1188 Westbank Rd	839.50	Henry J. French	Columbus, OH
10	1188 Westbank Rd	0.82	Henry J. French	Columbus, OH
11	1188 Westbank Rd	0.82	Henry J. French	Columbus, OH
12	Schrank Rd	2.84	City of Columbus	Columbus, OH
13	Schrank Rd	2.84	City of Columbus	Columbus, OH
14	Menow Rd	18.72	Charles J. Meier	Columbus, OH
15	US RT 127	2.83	Merger County Commissioners	Columbus, OH
16	US RT 127	2.83	Merger County Commissioners	Columbus, OH
17	US RT 127	2.83	Merger County Commissioners	Columbus, OH
18	US RT 127	2.83	Merger County Commissioners	Columbus, OH
19	Schrank Rd	3.5	Charles E. Zumbach, Sr. and Virginia Zumbach, Trust	Columbus, OH
20	Schrank Rd	0.56	Charles E. Zumbach, Sr. and Virginia Zumbach, Trust	Columbus, OH
21	Schrank Rd	2.6	Henry J. French	Columbus, OH
22	Em St	1.45	Zepeda & Reynolds	Columbus, OH
23	Em St	0.79	Mark Schickelmann, Inc.	Columbus, OH
24	Em St	0.21	Mark Schickelmann, Inc.	Columbus, OH
25	Em St	0.21	Mark Schickelmann, Inc.	Columbus, OH
26	Em St	1.84	Mark Schickelmann, Inc.	Columbus, OH
27	Em St	1.52	Mark Schickelmann, Inc.	Columbus, OH
28	Em St	1.45	C.I. Lee, Inc.	Columbus, OH
29	Schrank Rd	1.85	Carolyn A. Lefez	Columbus, OH
30	Schrank Rd	2.27	Nancy Ann Cherry	Columbus, OH
31	Schrank Rd	1.07	Charles J. and Mary E. Meier	Columbus, OH
32	Schrank Rd	0.25	Charles J. and Mary E. Meier	Columbus, OH
33	US RT 127	2.2	Charles J. and Mary E. Meier	Columbus, OH
34	US RT 127	2.2	Charles J. and Mary E. Meier	Columbus, OH

LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS
- USED IN HEC-2 COMPUTER PROGRAM
- PROPERTY BOUNDARIES
- INUNDATED AREA AS THE RESULT OF THE 39.4 FOOT SPILLWAY
- INUNDATED AREA AS THE RESULT OF THE 500 FOOT SPILLWAY
- PROPERTY IDENTIFICATION NUMBER

UNRECORDED DEEDS: DEEDS RECORDED IN PUBLIC RECORDS, COLUMBUS, OHIO, COUNTY OF FRANKLIN, OHIO, BOOK 10, PAGE 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.





CROSS SECTIONS OF BRIDGE OVER RIVER USED IN HEC-2 MODEL WERE OBTAINED FROM THE FINAL REPORT HYDROLOGIC AND HYDRAULIC ANALYSIS, GRAND LAKE ST. MARYS, AUGUST AND WARDER CO., OHIO, FEBRUARY 2, 1958, BOSSAW ENGINEERING, INC.

UNITED STATES GEOLOGICAL SURVEY DIGITAL EASTER GROUNDWORKS (CE-RXAS BRANTIS) DOWNLOADED FROM THE Ohio OFFICE OF INFORMATION TECHNOLOGY WEBSITE

GROUND SURFACE ELEVATIONS USED WERE OBTAINED FROM THE Ohio 15 METER DIGITAL ELEVATION MODEL, PUBLISHED BY THE Ohio DEPARTMENT OF PUBLIC SAFETY, DIVISION OF TELEMETRY AND REGIONAL RESPONSE, 2006.

LEGEND

- CASE LEASING AND RENTAL, INC. PROPERTY BOUNDARY
- CROSS SECTION NUMBER AND LOCATIONS USED IN HEC-2 COMPUTER PROGRAM
- INUNDATED AREA AS THE RESULT OF THE 30' 4" FOOT SPILLWAY
- INUNDATED AREA AS THE RESULT OF THE 500' FOOT SPILLWAY

Figure 10a
JUNE 2006 STORM EVENT
FLOOD INUNDATION MAP
Schottelstein Zox & Dunn Co., LPA
 Columbus, Ohio



TABLES

TABLES

MODEL RESULTS FOR HISTORICAL STORM EVENTS
GRAND LAKES MARIS
MERCER AND ADAMS COUNTIES, OHIO

TABLE 1

Rainfall/Storm event	Rainfall Amount ^a	Rainfall Duration ^b	38.4-Foot Spillway		500-Foot Spillway		Difference ^c	38.4-Foot Spillway		500-Foot Spillway		Difference ^d	38.4-Foot Spillway		500-Foot Spillway		Difference ^e	38.4-Foot Spillway	500-Foot Spillway	Difference ^f
			Minimum Lake Elevation	Maximum Lake Elevation	Minimum Discharge ^g	Maximum Discharge ^h		Minimum Lake Elevation ⁱ	Maximum Lake Elevation ^j	Minimum Discharge ^k	Maximum Discharge ^l		Minimum Lake Elevation ^m	Maximum Lake Elevation ⁿ	Minimum Discharge ^o	Maximum Discharge ^p				
March/April 1934 ^q	6.31	136	872.0 ^r	872.6 ^r	872.6 ^r	872.6 ^r	-0.3	395	2100	1775	3062	884.5	884.0	891.4	891.4	6.3	884.5	883.9	881.1	5.6
January 1936	6.15	198	872.6 ^r	872.3 ^r	872.3 ^r	872.3 ^r	-0.3	265	1337	1062	456	852.9	852.9	867.0	867.0	4.1	867.9	867.0	867.0	4.1
April 1938 ^s	3.56	84	872.6 ^r	872.0 ^r	872.0 ^r	872.0 ^r	-0.2	177	663	456	300	850.6	850.6	868.8	868.8	5.2	868.5	868.5	863.5	5.0
May 1948	4.11	132	872.5 ^r	872.2 ^r	872.2 ^r	872.2 ^r	-0.1	225	1038	632	330	852.3	852.3	857.8	857.8	4.9	857.7	857.7	857.7	4.8
February 1959 ^t	3.37	108	872.2 ^r	872.1 ^r	872.1 ^r	872.1 ^r	-0.1	177	809	532	296	852.3	852.3	858.5	858.5	5.0	853.5	853.5	853.5	4.8
April/May 1972	5.72	276	872.5 ^r	872.1 ^r	872.1 ^r	872.1 ^r	-0.4	229	976	748	352	851.6	851.6	863.8	863.8	5.6	863.1	863.1	858.5	5.4
May 1981 ^u	4.99	155	872.3 ^r	872.3 ^r	872.3 ^r	872.3 ^r	-0.1	193	1044	832	352	853.1	853.1	859.3	859.3	6.0	853.2	853.2	853.2	5.7
July 1982	8.94	245	872.4 ^r	872.4 ^r	872.4 ^r	872.4 ^r	-0.4	210	1208	978	398	853.2	853.2	859.3	859.3	6.0	853.2	853.2	853.2	5.7
January 1983 ^v	5.83	204	872.7 ^r	872.7 ^r	872.7 ^r	872.7 ^r	-0.3	265	1448	1160	465	854.2	854.2	859.9	859.9	5.7	854.1	854.1	859.5	5.2
February/March 1997 ^w	2.99	108	872.2 ^r	872.2 ^r	872.2 ^r	872.2 ^r	-0.2	155	640	465	265	852.9	852.9	856.9	856.9	4.0	853.0	853.0	853.0	4.0
July/August 1998 ^x	1.60	130	872.5 ^r	872.1 ^r	872.1 ^r	872.1 ^r	-0.4	227	813	576	327	852.7	852.7	857.9	857.9	4.2	853.6	853.6	857.7	4.1
May 2003 ^y	2.89	240	872.6 ^r	872.6 ^r	872.6 ^r	872.6 ^r	-0.6	247	667	421	267	853.8	853.8	857.1	857.1	3.3	853.7	853.7	857.0	3.3
June/July 2003 ^z	10.67	135	873.7 ^r	872.6 ^r	872.6 ^r	872.6 ^r	-1.0	397	2155	1549	648	856.5	856.5	864.9	864.9	4.7	856.2	856.2	860.2	4.0
December 2003 ^{aa}	3.42	326	873.3 ^r	872.5 ^r	872.5 ^r	872.5 ^r	-0.3	444	1744	1223	521	855.6	855.6	861.3	861.3	4.9	853.5	853.5	859.5	4.3
January 2005	7.43	105	872.5 ^r	872.6 ^r	872.6 ^r	872.6 ^r	-0.9	463	1981	1480	519	855.9	855.9	860.8	860.8	4.9	853.8	853.8	860.1	4.2
June 2006	N/A	N/A	872.0 ^r	872.4 ^r	872.4 ^r	872.4 ^r	-0.6	346	1328	1189	346	851.6	851.6	860.1	860.1	5.4	854.7	854.7	859.5	4.8

Notes: ^a Rainfall data was available in 15-min intervals as recorded by the NOAA gauge network and measured synthetic duration of 870.6 min. ^b The total rainfall event was recorded in 15-min intervals by the NOAA gauge network and measured synthetic duration of 870.6 min. ^c Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^d Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^e Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^f Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^g Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^h Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ⁱ Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^j Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^k Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^l Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^m Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ⁿ Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^o Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^p Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^q Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^r Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^s Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^t Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^u Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^v Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^w Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^x Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^y Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^z Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min. ^{aa} Data collected from the NOAA gauge network and measured synthetic duration of 870.6 min.

TABLE 2
 SUMMARY OF LAKE SURFACE LEVEL MEASUREMENT DATA
 GRAND LAKE ST. MARYS
 MERCER AND AUGLAIZE COUNTIES, OHIO

	APRIL 1, 1997 THROUGH JUNE 1, 1997 ⁽¹⁾		JUNE 1, 1997 THROUGH AUGUST 24, 2006 ⁽²⁾		Difference in Percentage
	Number of Measurements	Percentage of Total Measurements (percent)	Number of Measurements	Percentage of Total Measurements (percent)	
Total	23,305	100	521	100	0
Above 870.6 (feet msl)	4,994	21.4	382	73.3	51.9
Between 870.6 and 870.99 (feet msl)	2,720	11.7	78	15.0	3.3
Between 871.0 and 871.49 (feet msl)	1,711	7.3	167	32.1	24.7
Between 871.5 and 871.99 (feet msl)	461	2.0	122	23.4	21.4
Above 871.8 (feet msl) ⁽³⁾	227	1.0	52	10.0	9.0
Above 872.0 (feet msl)	102	0.4	15	2.9	2.4

Notes:
 (1) Time period cited was prior to the construction of the 500-foot spillway.
 (2) Time period cited is subsequent to the construction of the 500-foot spillway.
 (3) The cited elevation is the approximate GLSMA elevation at which the 500-foot spillway discharges a flow that will begin to overflow the Beaver Creek channel banks at the Case Property.
 msl = mean sea level

APPENDICES

LAKE GAUGE SURVEY RESULTS
(Referenced in the text on page 3)

APPENDIX A

Lee Surveying and Mapping Co., Inc.

Land Surveys • Topography • Subdivisions • Construction Layout

117 N. Madriver Street
Bellevue, OH 43311



1975 - 2005 - 30 YEARS OF EXCELLENCE

September 19, 2006

Schottenstein Zox & Dunn Co., LPA

P.O. Box 165020

Columbus OH 43216

ATTN: Stephen Samuels

RE: Survey of Gauges and Spillway Notch on Grand Lake St. Marys, Ohio

Dear Mr. Samuels:

This project was personally surveyed by my associate, William K. Bruce, P.S., Ohio Registered Surveyor Number 7437. He completed the field portion of the survey yesterday afternoon and checked his final notes in the late afternoon. He ran the survey in approximate one mile loops a distance of twelve miles around the lake (24 survey miles) using a Zeiss Model DINI Electronic Level (SN 207427). The pair of level rods are matching rods manufactured by Zeiss and Trimble (Model TD24). The level was checked for accuracy prior to proceeding with the survey. The survey proceeded at a fast pace in all types of weather including heavy rains on the first day of the survey. The final field work was completed at a speed of less than two hours per mile of survey by using extra personnel and two rods instead of the usual one.

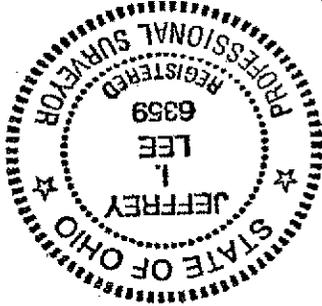
Initially, Mr. Bruce had communication problems with the prior survey company regarding the location of the bench marks to use. The problem was unavoidable due to the absence of Mr. Charles Munce from his office for two days. Since it was imperative that the project be completed quickly, Mr. Bruce used an assumed elevation for his beginning point and completed the survey with that basis for elevations. Once he obtained the bench mark locations required to match the prior surveys, he tied his survey to a point designated Bench Mark 2 in the Mercer County Engineer's Records. Bench Mark 2 is a chiseled "O" cut in the southeast wing of the U.S. Route 127 bridge over Beaver Creek opposite center-line Station 7+50 per the 1977 highway plans. The published elevation for Bench Mark 2 is 860.72 feet.

The correction to his assumed elevations will require adding 17.003 feet to each of his field elevations. Mr. Bruce's unadjusted closure for the total twenty-four mile distance is 0.04 feet of error in the twelve miles. 0.04 feet is about 1/2 inch.

Your original scope for this project requested that we provide the following information:

1. The elevation of the 50-foot notch in the center of the spillway located on the western side of Grand Lake St. Marys. Note that Mr. Bruce simply called this the top of spillway in his notes.
2. The elevation of the gauge on the East Bank of Grand Lake St. Marys.
3. The elevation of the gauge on the Western Bank of Grand Lake St. Marys.
4. The elevation of the gauge on the boathouse located on the north side of Grand Lake St. Marys.

ORIGINAL STAMP IN GREEN



Ohio Professional Surveyor 6359

Jeffrey Lee
 Sincerely,

I have attached a copy of Mr. Bruce's original field notes as well as a copy of the Mercer County Bench Mark notes as cited above. If you have need for any further information, please contact us.

- 878.612 of the hoist/crane.
- 873.308 TBM at the water gauge area is a chiseled "+" on top of a bolt at the base
- 875.551 Top of the 3 feet mark on the water gauge at the east end of the lake
- 877.003 A "MAG" nail TBM was set in the west side of a light pole in the middle of the maintenance area parking lot. The top of the head of the MAG nail is
- 872.764 There is no 3 feet mark on this gauge. This gauge could not be found at the beginning of the survey.
- 877.003 The top of the 2 feet mark on the gauge at the O.D.N.R. maintenance area boat building. The published elevation is 877.01 feet. The elevation from our field survey is
- 870.620 Mercer County Bench Mark 810 is the TBM for the west bank gauge if it is to be replaced. The location is defined on the attached county document at the end of this report
- 871.483 The gauge on the west bank does not exist anymore.
- 870.646 Top of the spillway on the north side
- 871.487 Top of the dam on the north side of the spillway
- 870.646 Top of the spillway on the south side
- 871.483 Top of the dam on the south side of the spillway
- 870.620 Top of the spillway on the south side

The results of the survey after the addition of the 17,003 feet and necessary variations from the original scope are as follows. All elevations are in feet and thousands of a foot:
 During a phone conversation with you, I was instructed to use the same mark on all of the gauges with a preference to use the 3 feet mark. Additionally, we were to, also, verify the elevations of each end of the dam and the top of the "V" slot in the dam.

1975 - 2005 - 30 YEARS OF EXCELLENCE



117 N. Madriver Street
 Bellefontaine OH 43311

Phone: (937) 593-7335
 Fax: (937) 593-7444

Land Surveys • Topography • Subdivisions • Construction Layout

Lee Surveying and Mapping Co., Inc.

ORIGINAL STAMP IN GREEN



NOTE: ADD 17.003' TO ALL ELEVATIONS ON PAGES 2 THROUGH 19. (PAGE 20 TIES MAIN LOOPS TO MERCER CO. ENGINEERS B.M.#2)

T.B.M. @ WATER GAUGE AREA IS A CHISELED "+" ON TOP OF A BOLT @ BASE OF HOIST/CRANE
878.612

TOP/3' MARK ON WATER GAUGE @ EAST END OF LAKE
873.308

T.B.M. @ O.D.N.R. MAINTENANCE AREA IS A "MAG" NAIL SET IN THE WEST SIDE OF A LIGHT POLE IN THE MIDDLE OF MAINTENANCE AREA PARKING LOT
875.551

O.D.N.R. MAINTENANCE AREA BOAT BUILDING
872.764

TOP/2' MARK ON WATER GAUGE @

T/SPILLWAY SOUTH SIDE NO GAUGE @ WEST BANK SIDE
870.62

T/DAM (SOUTH SIDE SPILLWAY)
871.483

T/SPILLWAY NORTH SIDE
870.646

TOP/DAM (NORTH SIDE SPILLWAY)
871.487

FINAL ELEVATIONS

(2) 4314096

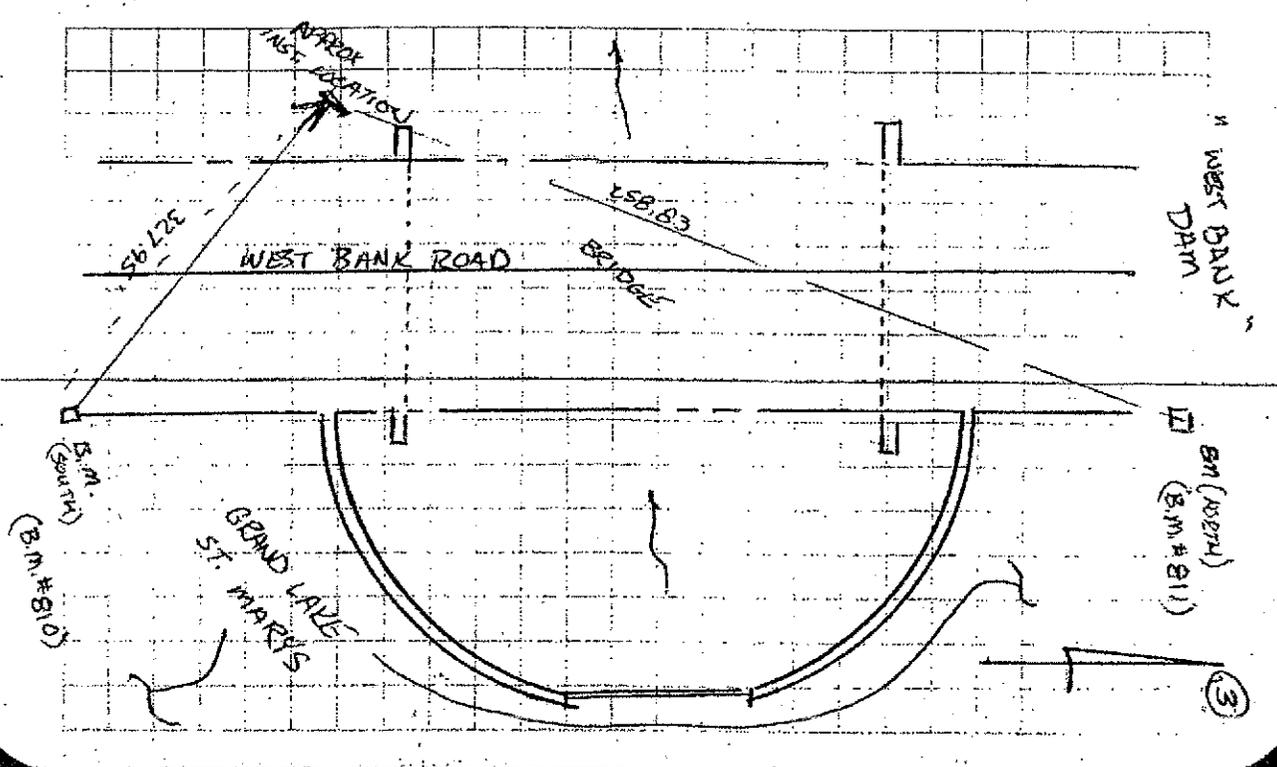
65' OVERCAST, P.M.

ADJUTMENT = ZERO DIM 20

9/12/06 KB-CW-DL

DESC	+	X	-	ELEV	NOTE
B.M. CHISELED	3.944	863.944		860.00	SOUTH
ASSUMED 85.00					
(RIGHT) INTO OBTAIN RD					
B.M. CHISELED "I"			4.164	859.78	NORTH
877.01 (#810)					
T/DAM @ (872.81) #811			9.460	854.984	
SPILLWAY (NORTH)					
THOSE OF SPILLWAY (NORTH)			10.301	853.643	290.45'
T/DAM @ SPILLWAY (SOUTH)			9.464	854.48	
THOSE @ SPILLWAY (SOUTH)			10.327	853.617	273.56'
ELEV @ SOUTH B.M.			3.942		

NOTE: BRANCH LOOPS UPON ASSUMED ELEV, ARE BASED



4314296
45° DIVERGENT / REAR SIGHT

9/12/06
LEARNER LOOP #1
(BEGIN ON WEST BANK ROAD)
REAR SIGHT

DESC	+	X	-	BEV.	NOTE
TP#1	4728	864.348	4770	859.62	
TP#2	5049	844.824	4573	859.775	
TP#3	4973	865.227	4569	860.254	
TP#4	4266	864.499	4994	860.233	
TP#5	4853	844.464	4808	859.611	
TP#4	4800	865.035	4229	860.235	
TP#3	4555	864.811	4779	860.256	
TP#2	4480	855.297	5034	859.777	
TP#1	5373	864.257	4634	859.623	
CHK. JUDGE B.M.		864.996	4634	859.623	
			5.213	859.708	

1003
HIGH

60° DIVERGENT

9/13/06
LEARNER LOOP #2

KB2W-02

5

DESC	+	X	-	BEV.	NOTE
TP#5	3577	863.188		859.611	
TP#6	5508	861.325	7.371	855.817	
TP#7	5499	861.713	5.111	856.214	
TP#8	6.186	863.415	4.484	857.229	
TP#9	5.109	861.424	7.100	856.315	
TP#10	7.365	864.587	4.242	857.182	
TP#11	7.005	864.414	7.128	857.449	
TP#12	1.702	864.237	1.879	862.535	
TP#11	8.109	865.606	0.830	857.407	
TP#10	4.420	861.604	8.422	857.184	
TP#9	7.888	864.204	5.288	856.316	
TP#8	4.660	861.620	6.974	857.230	
TP#7	4.390	861.217	5.408	856.212	
TP#6	5.005	861.217	5.408	855.809	
TP#5	7.560	863.369	3.764	859.605	

(1004 (1005))

(6)

9/13/06

K13-DW-DW-RP

LOOP # 3

DESC	T	T	ELEV	NOTES
TP#12	2.456	864.991	862.535	
TP#13	5.804	864.398	858.594	
TP#14	8.640	869.819	861.179	
TP#15	4.970	872.269	867.299	
TP#16	1.390	864.375	862.985	
TP#17	6.624	872.999	874.406	857.344
TP#18	6.286	860.449	866.704	863.142
TP#19	2.543	860.781	872.981	863.635
TP#20	9.849	866.975	870.966	863.082
TP#21	4.472	866.860	872.538	861.146
TP#22	6.407	867.928	874.204	865.131
TP#21	5.551	867.928	881.209	867.147
TP#20	2.998	866.144	877.444	868.081
TP#19	2.530	866.144	877.498	863.636
TP#18	3.581	867.588	877.698	863.636
TP#17	7.419	866.829	877.698	862.982
TP#16	9.267	872.249	877.698	862.982
TP#15	2.451	869.745	877.698	862.982
TP#14	3.100	864.275	861.175	
TP#13	6.318	864.905	858.587	
TP#12			862.529	

006
M

9/13/06

K8-DW-DW-RP

LOOP # 4

DESC	T	T	ELEV	NOTES
TP#22	4.337	861.468	865.131	
TP#23	4.199	867.52	868.321	
TP#24	9.867	873.454	863.587	
TP#25	5.714	870.095	876.981	
TP#26	5.259	875.766	870.507	
TP#27	7.608	881.468	873.660	
TP#28	5.668	881.115	875.447	
TP#29	5.883	881.923	872.040	
TP#30	5.728	882.306	876.598	
TP#31	3.921	881.692	877.091	
TP#32	2.640	880.811	878.171	
TP#31	5.072	882.154	877.082	
TP#30	5.150	881.756	876.600	
TP#29	4.943	880.986	876.043	
TP#28	5.772	881.221	875.449	
TP#27	1.647	875.511	873.864	
TP#26	6.025	876.539	874.514	
TP#25	2.425	873.410	876.965	
TP#24	3.748	867.341	863.573	
TP#23	5.867	869.199	863.332	
TP#22			865.144	

013
HIGH

8

9/14/06

750
RB-PW-DL
LOOPS

P SANDY

DESC	+	X	-	AZIM	NOTES
T.P.#32	7.590	885761		878.171	
T.P.#33	4.548	883312	6.917	878.844	
T.P.#34	7.745	886909	4.228	879.164	
T.P.#35	3.990	883281	7.618	879.291	
T.P.#36	4.715	880468	7.333	875.948	
T.P.#37	5.719	879989	6.393	874.270	
T.P.#38	6.229	880870	5.348	874.641	
T.P.#39	8.421	885244	4.027	876.843	
T.P.#40	2.792	881458	6.598	878.666	
T.P.#41	0.700	870153	12.005	869.453	
T.P.#42	4.237	864892	9.498	860.655	
T.P.#43	9.601	869304	5.189	859.703	
T.P.#44	0.445	869429	0.320	868.984	
T.P.#45	5.171	864880	9.720	859.709	
T.P.#42	9.386	870047	4.219	860.661	
T.P.#41	12.004	881464	0.587	869.460	
T.P.#40	6.571	885245	2.790	868.674	
T.P.#39	4.048	880900	8.393	874.852	
T.P.#38	5.430	880281	6.249	874.651	
T.P.#37	6.482	880705	5.798	874.283	
T.P.#36	7.298	883258	4.805	875.966	
T.P.#35	3.771	887076	3.553	879.305	
T.P.#34	4.328	883506	7.898	879.178	

9

DESC	+	X	-	AZIM	NOTES
T.P.#33	7.009	885847	4.648	878.858	
T.P.#32			7.682	878.185	
					0.014 HIGH

(10)

DESC.	+	-	BELEV.	NOTES
TR# 44	9,328	878.312	878.984	
TR# 45	7,429	882.023	874.594	
TR# 46	7,856	885.961	878.105	
TR# 47	2,971	884.371	881.400	THIN SHOUL
TR# 48	0,518	875.520	875.002	THIN SHOUL
TR# 49	0,427	866.573	866.166	SHOUL
TR# 50	6,214	805.314	854.108	
TR# 51	7,978	869.995	861.987	
TR# 52	9,645	870.775	861.080	
TR# 53	7,582	883.090	875.508	
TR# 54	1,217	878.888	877.671	
TR# 55	2,295	871.695	869.400	
TR# 56	4,806	868.650	863.844	
TR# 57	8,989	872.246	863.338	
TR# 58	2,792	872.190	869.398	
TR# 57	5,192	868.532	863.346	
TR# 56	7,585	871.427	863.842	
TR# 55	9,242	878.638	869.396	
TR# 54	5,084	882.950	877.666	
TR# 53	1,277	879.779	875.502	
TR# 52	2,712	869.791	867.079	
TR# 51	3,175	868.159	861.984	
TR# 50	7,387	866.488	859.101	

(11)

DESC.	+	-	BELEV.	NOTES
TR# 49	9,226	875.376	860.170	
TR# 48	9,153	884.162	875.009	
TR# 47	4,514	885.922	881.408	
TR# 46	3,921	882.629	878.108	
TR# 45	3,954	878.553	874.594	
TR# 44		9,560	868.943	
		0.009 HIGH		

(12)

KB-MS-DL
9/16/06
LOOP # 7
70°-FOLLY

DESC	+	-	BELEV	ADJTS
TP#58	5.553	874.951		869.398
TP#59	5.403	874.421	5.933	869.018
TP#60	5.971	876.997	3.395	871.026
TP#61	4.459	872.194	9.262	867.735
TP#62	8.030	877.521	3.503	868.691
TP#63	9.458	885.797	1.182	876.339
TP#64	5.095	887.298	3.594	882.203
TP#65	2.707	882.708	7.297	880.001
TP#66	3.023	877.427	8.304	874.444
TP#67	7.743	880.306	4.864	872.563
TP#68	5.562	882.431	3.437	876.869
TP#69	7.692	882.304	7.739	874.692
TP#68	3.382	880.25	5.516	876.868
TP#67	4.715	877.279	7.686	872.564
TP#66	8.251	882.655	2.875	874.404
TP#65	7.180	887.182	2.653	880.002
TP#64	3.639	885.845	4.976	882.206
TP#63	1.194	877.537	9.502	876.343
TP#62	3.501	872.197	8.841	868.696
TP#61	9.316	877.056	4.456	867.741
TP#60	3.316	874.349	6.024	871.033
TP#59	5.904	874.929	5.324	869.025
TP#58			5.525	869.404

AUGUSTINE
INDEPENDENCE CO
LINE

(.006 HIGH)

9/16/06
LOOP # 8
75°
SUBCAST

DESC	+	-	BELEV	ADJTS
TP#69	6.867	881.559		874.692
TP#70	5.336	883.894	3.501	876.058
TP#71	3.832	884.125	3.101	880.293
TP#72	4.037	878.504	9.658	874.467
TP#73	1.337	873.174	6.667	871.857
TP#74	4.826	868.288	9.717	863.457
TP#75	9.565	872.978	4.870	863.413
TP#76	5.233	875.296	2.915	870.063
TP#77	7.348	879.314	3.330	871.966
TP#78	6.846	878.055	8.105	871.209
TP#79	1.443	878.004	1.494	876.561
TP#78	8.115	879.326	6.793	871.211
TP#77	3.250	875.221	7.355	871.971
TP#76	2.732	872.004	5.149	870.072
TP#75	4.797	868.214	9.387	863.417
TP#74	9.686	873.146	4.754	863.46
TP#73	6.745	875.583	1.308	871.836
TP#72	9.594	884.061	4.116	874.467
TP#71	3.071	883.361	3.771	880.280
TP#70	3.580	881.633	5.308	878.053
TP#69			6.949	874.684

EXTREMELY
DRIVE TO
SPLIT
PAVER

(.008 LOW)

(13)

(18)

KB-CU-DL
9/17/06

700-SUNDAY
LOOP # 11

FROM STATE PARK BLDG
WATER GAUGE

DESC

T.P.# 73

T.P.# 98

T.P.# 99

T.P.# 100

T.B.M.# 2

M&M NAIL SET

N. WEST SIDE

OF LIGHT POLE

IN ENTRANCE OF

STATE PARK

MAINTENANCE

FACILITY PARKING

LOT (APPROX 1/0,

ABOVE PAVEMENT

ELEV.)

T.P.# 101

TOP/2' WATER *

GAUGE

T.P.# 101

T.P.# 100

T.P.# 99

T.P.# 98

T.P.# 73

70

ELEV.

NOTE

6.387 863.122

6.723 869.207

9.006 857.308

4.222 858.743

6.474 856.664

6.083 853.954

5.231 856.664

5.417 857.508

2.772 863.322

1.255 869.407

3.897 872.033

6.083 853.954

5.231 856.664

5.417 857.508

2.772 863.322

1.255 869.407

3.897 872.033

6.083 853.954

5.231 856.664

5.417 857.508

2.772 863.322

1.255 869.407

3.897 872.033

* NOTE: 2' WATER GAUGE READS

DUCK CHAIR, INSIDE STATE PARK
MAINT FACILITY SPORT HOUSE

800-SUNDAY
LOOP # 11-B

(19)

ELEV. NOTE

871.837

869.211

863.127

857.313

856.471

858.548

857.315

863.129

869.215

871.844

856.471

855.761

856.471

855.761

856.471

856.471

856.471

856.471

856.471

856.471

856.471

856.471

856.471

856.471

856.471

856.471

(+ .007)

DESC.

T.P.# 73

T.P.# 98

T.P.# 99

T.P.# 100

T.P.# 101

T.B.M.# 2

T.P.# 100

T.P.# 99

T.P.# 98

T.P.# 73

T.P.# 100

T.P.# 101

+

3.987 875.824

1.272 870.483

2.669 865.796

5.124 862.437

5.896 862.367

8.545 865.86

7.411 870.54

6.432 875.647

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

5.373 861.844

5.941 861.702

-

6.613 869.211

7.356 863.127

8.483 857.313

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

-

6.613 869.211

7.356 863.127

8.483 857.313

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

3.863 871.844

5.966 856.471

3.819 858.548

5.052 857.315

2.731 863.129

1.325 869.215

B

LAKE ELEVATION DATA
(Referenced in the text on page 3)

APPENDIX B

TABLE 2
SUMMARY OF LAKE SURFACE LEVEL MEASUREMENT DATA
GRAND LAKE ST. MARYS
MERCER AND AUGLAIZE COUNTIES, OHIO

	APRIL 1, 1927 THROUGH JUNE 1, 1997 ⁽¹⁾		JUNE 1, 1997 THROUGH AUGUST 21, 2006 ⁽²⁾		Difference in Percentage
	Number of Measurements	Percentage of Total Measurements (percent)	Number of Measurements	Percentage of Total Measurements (percent)	
Total	23,305	100	521	100	0
Above 870.6 (feet msl)	4,994	21.4	382	73.3	51.9
Between 870.6 and 870.99 (feet msl)	2,720	11.7	78	15.0	3.3
Between 871.0 and 871.49 (feet msl)	1,711	7.3	167	32.1	24.7
Between 871.5 and 871.99 (feet msl)	461	2.0	122	23.4	21.4
Above 871.8 (feet msl) ⁽³⁾	227	1.0	52	10.0	9.0
Above 872.0 (feet msl)	102	0.4	15	2.9	2.4

Notes:
⁽¹⁾ Time period cited was prior to the construction of the 500-foot spillway.
⁽²⁾ Time period cited is subsequent to the construction of the 500-foot spillway.
⁽³⁾ The cited elevation is the approximate CISM elevation at which the 500-foot spillway discharges a flow that will begin to overflow the Beaver Creek channel banks at the Case property.
 msl = mean sea level

APPENDICES

LAKE GAUGE SURVEY RESULTS
(Referenced in the text on page 3)

APPENDIX A

Lee Surveying and Mapping Co., Inc.

Land Surveys • Topography • Subdivisions • Construction Layout



1975 - 2005 - 30 YEARS OF EXCELLENCE

117 N. Madriver Street
Bellefontaine OH 43311

Phone: (937) 593-7335
Fax: (937) 593-7444

September 19, 2006

Schottenstein Zox & Dunn Co., LPA
P.O. Box 165020
Columbus OH 43216

ATTN: Stephen Samuels

RE: Survey of Gauges and Spillway Notch on Grand Lake St. Marys, Ohio

Dear Mr. Samuels:

This project was personally surveyed by my associate, William K. Bruce, P.S., Ohio Registered Surveyor Number 7437. He completed the field portion of the survey yesterday afternoon and checked his final notes in the late afternoon. He ran the survey in approximate one mile loops a distance of twelve miles around the lake (24 survey miles) using a Zeiss Model DINI Electronic Level (SN 207427). The pair of level rods are matching rods manufactured by Zeiss and Trimble (Model TD24). The level was checked for accuracy prior to proceeding with the survey. The survey proceeded at a fast pace in all types of weather including heavy rains on the first day of the survey. The final field work was completed at a speed of less than two hours per mile of survey by using extra personnel and two rods instead of the usual one.

Initially, Mr. Bruce had communication problems with the prior survey company regarding the location of the bench marks to use. The problem was unavoidable due to the absence of Mr. Charles Munce from his office for two days. Since it was imperative that the project be completed quickly, Mr. Bruce used an assumed elevation for his beginning point and completed the survey with that basis for elevations. Once, he obtained the bench mark locations required to match the prior surveys, he tied his survey to a point designated Bench Mark 2 in the Mercer County Engineer's Records. Bench Mark 2 is a chiseled "O" cut in the southeast wing of the U.S. Route 127 bridge over Beaver Creek opposite center-line Station 7+50 per the 1977 highway plans. The published elevation for Bench Mark 2 is 860.72 feet.

The correction to his assumed elevations will require adding 17.003 feet to each of his field elevations. Mr. Bruce's unadjusted closure for the total twenty-four mile distance is 0.04 feet of error in the twelve miles. 0.04 feet is about 1/2 inch.

Your original scope for this project requested that we provide the following information:

1. The elevation of the 50-foot notch in the center of the spillway located on the western side of Grand Lake St. Marys. Note that Mr. Bruce simply called this the top of spillway in his notes.
2. The elevation of the gauge on the East Bank of Grand Lake St. Marys.
3. The elevation of the gauge on the Western Bank of Grand Lake St. Marys.
4. The elevation of the gauge on the boathouse located on the north side of Grand Lake St. Marys.

4314096.ltr.wps

ORIGINAL STAMP IN GREEN



Jeffrey Lee
 Ohio Professional Surveyor 6359

Sincerely,

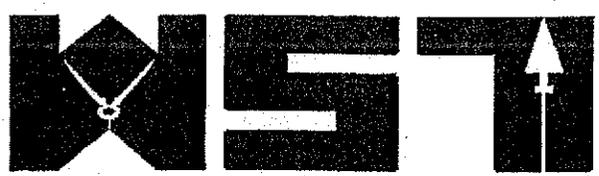
I have attached a copy of Mr. Bruce's original field notes as well as a copy of the Mercer County Bench Mark notes as cited above. If you have need for any further information, please contact us.

- 878.612 of the hoist/crane.
- 873.308 TBM at the water gauge area is a chiseled "+" on top of a bolt at the base
- 875.551 Top of the 3 feet mark on the water gauge at the east end of the lake
- A "MAG" nail TBM was set in the west side of a light pole in the middle of the maintenance area parking lot. The top of the head of the MAG nail is
- 872.764 There is no 3 feet mark on this gauge. This gauge could not be found at the beginning of the survey.
- 877.003 The top of the 2 feet mark on the gauge at the O.D.N.R. maintenance area boat building.
- The published elevation is 877.01 feet. The elevation from our field survey is
- Mercer County Bench Mark 810 is the TBM for the west bank gauge if it is to be replaced. The location is defined on the attached county document at the end of this report
- The gauge on the west bank does not exist anymore.
- 870.620 Top of the spillway on the south side
- 871.483 Top of the dam on the south side of the spillway
- 870.646 Top of the spillway on the north side
- 871.487 Top of the dam on the north side of the spillway

The results of the survey after the addition of the 17,003 feet and necessary variations from the original scope are as follows. All elevations are in feet and thousands of a foot.

During a phone conversation with you, I was instructed to use the same mark on all of the gauges with a preference to use the 3 feet mark. Additionally, we were to, also, verify the elevations of each end of the dam and the top of the "V" slot in the dam.

1975 - 2005 - 30 YEARS OF EXCELLENCE



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 Bellefontaine OH 43311

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 Fax: (937) 593-7444

Lee Surveying and Mapping Co., Inc.

FINAL ELEVATIONS

TOP/DAM (NORTH SIDE SPILLWAY) 871.487

T/SPILLWAY NORTH SIDE 870.646

T/DAM (SOUTH SIDE SPILLWAY) 871.483

T/SPILLWAY SOUTH SIDE 870.62

NO GAUGE @ WEST BANK SIDE

TOP/2' MARK ON WATER GAUGE @

O.D.N.R. MAINTENANCE AREA BOAT BUILDING 872.764

T.B.M. @ O.D.N.R. MAINTENANCE AREA IS A "MAIL SET IN THE WEST SIDE OF LIGHT POLE IN THE MIDDLE OF MAINTENANCE AREA PARKING LOT

TOP/3' MARK ON WATER GAUGE @ EAST END OF LAKE 873.308

T.B.M. @ WATER GAUGE AREA IS A CHISELED "+" ON TOP OF A BOLT @ BASE OF HOIST/CRAVE 878.612

NOTE: ADD 17.003 TO ALL ELEVATIONS ON PAGES 2 THROUGH 19. (PAGE 20 TIES MAIN LOOPS TO MERCER CO. ENGINEERS B.M.#2)



ORIGINAL STAMP IN GREEN

② 4314096

9/12/06 65° OVERCAST, RAIN

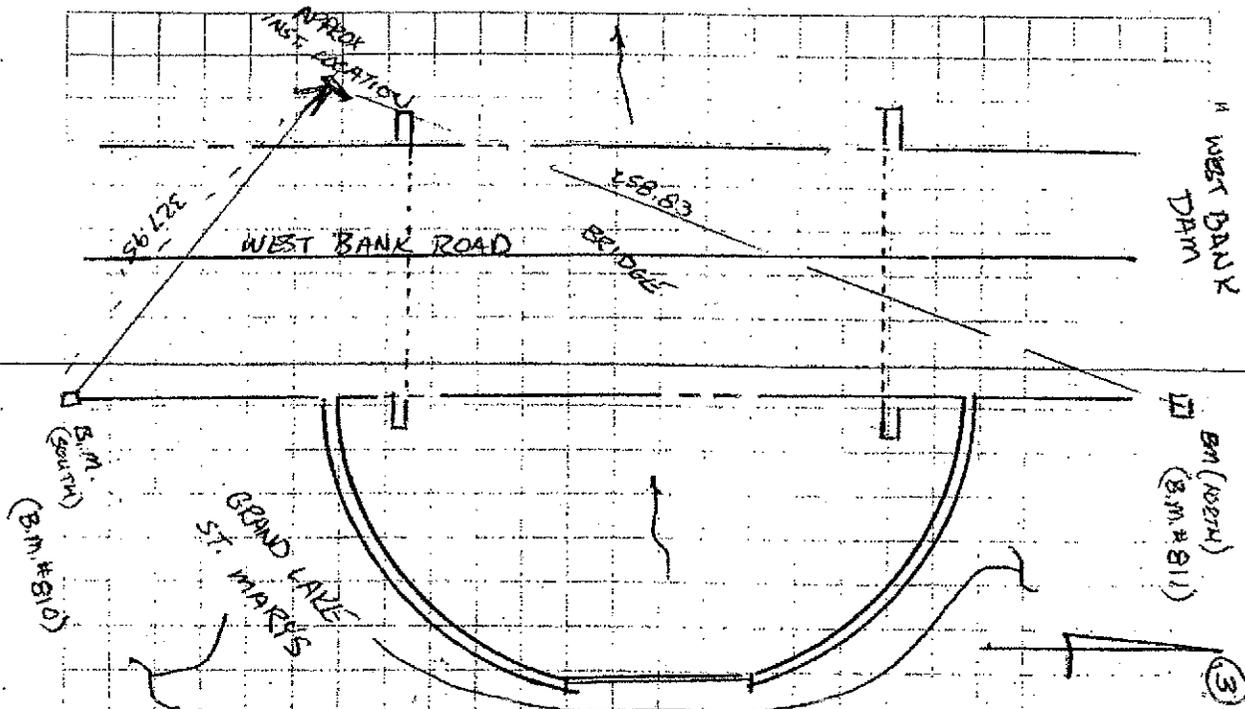
KB-CW-DL

ADJUTMENT = 2.555 DINI 20

DESC	+	-	ELV	NOTE
B.M. CHISELED	3.944	863.944	860.00	SOUTH
ASSUMED B.B.C.C.				
(GIVEN) INFO OBTAINED				
877.01 (4/5/06)				
B.M. CHISELED		4.164	859.78	NORTH
(876.81) # 811				
7 DAM @ SPILLWAY (NORTH)		9.460	854.984	
7 DAM @ SPILLWAY (NORTH)		10.301	853.643	280.45'
7 DAM @ SPILLWAY (SOUTH)		9.464	854.48	
7 DAM @ SPILLWAY (SOUTH)		10.327	853.617	273.66'
ELV IN @ SOUTH B.M.		3.942		

NOTE: BRANCH LOOPS UPON ASSUMED ELV.

ARC BASED



WEST BANK DAM

B.M. (NORTH) (B.M. # 811)

B.M. (SOUTH) (B.M. # 810)

GRAND LAKE ST. MARYS

WEST BANK ROAD

BRIDGE

N. PEAK INST. LOCATION

327.95

258.83

③

(4)

431409C

65° OVERCAST / RAIN

9/12/06

KB-2W-DL

LEBLK LOOP #1

DESC + X - ELEV. NOTES
B.M. CHISEL RD 4.762 864.388
4.610 869.39

TR#1	4.728	864.348	4.770	859.62
TR#2	5.049	864.824	4.573	859.775
TR#3	4.973	865.227	4.569	860.254
TR#4	4.266	864.499	4.570	860.233
TR#5	4.853	864.464	4.888	859.611
TR#4	4.800	865.035	4.229	860.235
TR#3	4.555	864.811	4.779	860.256
TR#2	4.480	855.277	5.034	859.777
TR#1	5.373	864.257	4.634	859.623
CHK. M. @ B.M.		864.996	5.213	859.783

POB5
FIELD

60° OVERCAST

KB-2W-DL

9/13/06

LOOP #2

(5)

DESC	+ X -	ELEV.	NOTES
TR#5	3.577	863.188	859.611
TR#6	5.508	861.325	7.371 855.817
TR#7	5.499	861.713	5.111 856.214
TR#8	6.186	863.415	4.484 857.229
TR#9	5.109	861.424	7.100 856.315
TR#10	7.355	864.587	4.242 857.182
TR#11	7.045	864.414	7.128 857.409
TR#12	1.702	864.237	1.879 862.535
TR#11	8.109	865.606	0.630 857.407
TR#10	4.420	861.604	8.422 857.184
TR#9	7.888	864.204	5.288 856.316
TR#8	4.660	861.620	6.914 857.230
TR#7	4.390	861.217	5.408 856.212
TR#6	5.005	861.217	5.408 855.809
TR#5	7.560	863.369	3.764 859.605

(864.100)

(6)

9/13/06

K13-DW-DW-RP

LOOP # 3

DESC	+	-	ELV.	NOTES
TR# 12	2.456	864.991	862.535	
TR# 13	5.804	864.398	858.594	
TR# 14	8.640	869.819	861.179	
TR# 15	4.970	872.269	867.299	
TR# 16	1.390	864.375	9.284	862.985
TR# 17	6.604	878.949	7.031	874.985
TR# 18	6.286	860.449	3.806	874.254
TR# 19	2.543	861.781	2.793	877.077
TR# 20	9.849	866.993	3.096	877.444
TR# 21	4.472	876.619	5.785	881.258
TR# 22	6.407	871.538	6.487	879.193
TR# 21	5.551	867.928	4.391	881.209
TR# 20	2.998	866.111	4.617	877.444
TR# 19	2.530	865.158	2.443	877.698
TR# 18	3.581	877.383	6.024	877.204
TR# 17	7.419	876.859	6.383	877.402
TR# 16	9.267	872.249	1.777	877.044
TR# 15	2.451	869.745	4.955	867.294
TR# 14	3.100	864.275	8.570	861.175
TR# 13	6.318	864.905	5.688	858.587
TR# 12			2.376	868.529

9/13/06

K8-DW-DL-RP

LOOP # 4

DESC	+	-	ELV.	NOTES
TR# 22	4.337	861.468	865.131	
TR# 23	4.199	867.52	6.147	868.321
TR# 24	9.867	873.954	3.983	865.567
TR# 25	5.714	870.495	2.473	876.981
TR# 26	5.259	875.766	6.188	870.507
TR# 27	7.608	881.468	5.359	873.660
TR# 28	5.668	881.115	6.021	875.447
TR# 29	5.883	881.923	5.075	876.040
TR# 30	5.788	882.366	5.325	876.598
TR# 31	3.921	881.662	5.325	877.081
TR# 32	2.640	880.611	2.831	878.171
TR# 31	5.072	882.154	3.729	877.082
TR# 30	5.150	881.756	5.554	876.600
TR# 29	4.943	880.986	5.707	876.043
TR# 28	5.772	881.221	5.537	875.449
TR# 27	1.647	875.511	7.357	873.864
TR# 26	6.025	876.539	4.997	870.514
TR# 25	2.425	873.410	5.554	870.965
TR# 24	3.748	867.341	9.817	863.593
TR# 23	5.867	869.199	4.009	863.332
TR# 22			4.055	865.144

(7)

806
LWN

013
H164

8

9/14/06

750 P. SUNDY

KB- PW-DL

ADP#5

DESC	+	-	ADP#5	ADP#5	ADP#5
T.P.#32	7.590	885.761		878.171	
T.P.#33	4.548	883.392	6.917	878.844	
T.P.#34	7.745	886.909	4.228	879.164	
T.P.#35	3.990	883.281	7.618	879.291	
T.P.#36	4.715	880.468	7.333	875.948	
T.P.#37	5.719	879.989	6.393	874.270	
T.P.#38	6.229	880.870	5.348	874.641	
T.P.#39	8.421	885.264	4.027	876.843	
T.P.#40	2.792	881.458	6.598	878.266	
T.P.#41	0.700	870.153	12.005	869.453	
T.P.#42	4.237	864.892	9.498	860.655	
T.P.#43	9.601	869.304	5.189	859.703	
T.P.#44	0.445	869.429	0.320	868.984	
T.P.#43	5.171	864.880	9.720	859.709	
T.P.#42	9.386	870.047	4.219	860.661	
T.P.#41	12.004	881.464	0.587	869.466	
T.P.#40	6.571	885.245	2.790	868.674	
T.P.#39	4.048	880.906	8.393	876.852	
T.P.#38	5.430	880.081	6.249	874.651	
T.P.#37	6.482	880.705	5.798	874.283	
T.P.#36	7.298	883.058	4.805	875.966	
T.P.#35	7.771	887.076	3.953	879.305	
T.P.#34	4.320	883.506	7.898	879.178	

9

DESC	+	-	ADP#5	ADP#5	ADP#5
T.P.#33	7.009	885.867	4.648	878.858	
T.P.#32			7.682	878.185	
			0.014 HIGH		

(10)

DESC	+	-	ELEV	NOTES
TP# 44	9.328	878.312	889.984	
TP# 45	7.429	882.023	874.594	
TP# 46	7.856	885.961	876.105	
TP# 47	2.971	884.371	881.400	TURN SHORL
TP# 48	0.518	875.520	876.022	TURN SHORL
TP# 49	0.427	880.543	880.148	SHORL
TP# 50	6.214	885.314	859.109	
TP# 51	7.698	889.995	861.987	
TP# 52	7.968	816.775	867.080	
TP# 53	7.582	883.090	875.508	
TP# 54	1.217	878.888	877.671	
TP# 55	2.295	871.696	869.400	
TP# 56	4.806	888.650	863.844	
TP# 57	8.987	872.246	863.338	
TP# 58	8.908	872.190	869.398	
TP# 57	5.192	868.532	863.346	
TP# 56	7.585	871.427	863.842	
TP# 55	9.242	878.638	849.396	
TP# 54	5.284	882.950	877.666	
TP# 53	1.277	870.779	875.502	
TP# 52	2.712	869.791	867.079	
TP# 51	3.175	865.159	861.984	
TP# 50	7.387	860.408	859.101	

(11)

DESC	+	-	ELEV	NOTES
TP# 49	9.226	875.396	864.170	
TP# 48	9.153	884.162	875.609	
TP# 47	4.514	885.922	891.408	
TP# 46	3.921	882.629	878.605	
TP# 45	3.954	878.553	874.599	
TP# 44			868.993	
		0.009 HIGH		

(12)

KIS-MS-DL
9/16/06
70° EOLGAY

DESC	+	X	-	ELEV	NOTES
TP#58	5.553	874.951		869.398	
TP#59	5.403	874.421	5.933	869.018	
TP#60	5.971	876.997	3.395	871.026	
TP#61	4.459	872.194	9.262	867.735	
TP#62	8.930	877.521	3.503	868.691	
TP#63	9.458	885.797	1.182	876.339	
TP#64	5.095	887.298	3.594	882.203	
TP#65	2.707	882.708	7.297	880.001	
TP#66	3.023	877.427	8.304	874.404	
TP#67	7.743	880.306	4.864	872.563	
TP#68	5.562	882.431	3.437	876.869	
TP#69	7.692	882.384	7.739	874.692	
TP#68	3.382	880.25	5.516	876.868	
TP#67	4.715	877.279	7.686	872.564	
TP#66	8.251	882.655	2.875	874.404	
TP#65	7.180	887.182	2.653	880.002	
TP#64	3.639	885.845	4.976	882.206	
TP#63	1.194	877.537	9.502	876.343	
TP#62	3.501	872.197	8.841	868.696	
TP#61	9.316	877.056	4.456	867.741	
TP#60	3.316	874.349	6.024	871.033	
TP#59	5.904	874.929	5.324	869.025	
TP#58			5.525	869.404	

ANGLE 172
INTERCEPT
LINE

(.006 HIGH)

9/16/06
LOOP #8
75° SUBCAST

DESC	+	X	-	ELEV	NOTES
TP#69	6.867	881.559		874.692	
TP#70	5.336	883.894	3.501	878.058	
TP#71	3.832	884.125	3.101	880.293	
TP#72	4.037	878.504	9.658	874.467	
TP#73	1.337	873.174	6.667	871.857	EXTREME
TP#74	4.826	868.283	9.717	863.457	BEING TO
TP#75	9.565	872.978	4.870	863.413	SPRINK
TP#76	5.233	875.296	2.915	870.063	
TP#77	7.348	879.314	3.330	871.966	
TP#78	6.846	878.055	8.105	871.209	
TP#79	1.443	878.004	1.494	876.561	
TP#78	8.115	879.326	6.793	871.211	
TP#77	3.250	875.221	7.355	871.971	
TP#76	2.732	872.804	5.149	870.072	
TP#75	4.797	868.214	9.387	863.417	
TP#74	9.686	873.146	4.754	863.46	
TP#73	6.745	875.583	1.308	871.838	
TP#72	9.594	884.081	4.116	874.467	
TP#71	3.071	883.361	3.771	880.290	
TP#70	3.580	881.633	5.308	878.053	
TP#69			6.949	874.684	

(.008 LOW)

(13)

(18)

2B-CW-DL
9/17/06
70°-SUNDAY

LOOP # 11

FROM STATE PARK ENTR. TO WATER GAUGE

DESC	+	-	ELEV.	NOTE
T.P.# 73	4.093		875.93	
T.P.# 98	0.302		875.509	
T.P.# 99	3.192		866.314	
T.P.# 100	5.657		862.965	
T.B.M.# 2	4.395		863.138	
T.P.# 101			9.006	857.309
T.P.# 100			6.387	863.122
T.P.# 99			6.723	869.207
T.P.# 73			871.837	
T.P.# 101			6.474	856.664
T.P.# 100			6.083	855.954
T.P.# 99			5.231	856.664
T.P.# 98			5.417	857.508
T.P.# 98			2.772	863.372
T.P.# 98			1.255	869.407
T.P.# 73			3.897	872.033

M&T NAVI SECT
IN WEST SIDE
OF LIGHT POLE
IN CENTER OF
STATE PARK
MAINTENANCE
FACILITY PARKING
LOT (APPROX. 10'
ABOVE PARKING
ELEV.)

* NOTE: 2' WATER GAUGE HANDS
OUTCHAIN, INSIDE SPORT PARK
MAINT FACILITY BOAT HOUSE

LOOP # 11 - B 80°-SUNDAY

(19)

DESC	+	-	ELEV.	NOTE
T.P.# 73	3.987		875.824	
T.P.# 98	1.272		870.483	
T.P.# 99	2.669		865.796	
T.P.# 100	5.124		862.437	
T.P.# 101	5.896		862.367	
T.B.M.# 2			3.819	858.548
T.P.# 100	8.545		865.86	5.052
T.P.# 99	7.411		870.54	2.731
T.P.# 98	6.432		875.647	1.325
T.P.# 73			3.803	871.844
T.P.# 100	5.373		861.844	
T.P.# 101			6.083	855.761
T.P.# 101			5.231	856.471

(+ .007)

PROJECT Determine Elevation of DATE 8-18-03

TASK 2 New bench marks as described based on

Bm # 2 from Beaver Creek plans - 1977

Desc./Loca. BS HI FS Elev.

Bm # 2 from Beaver Creek plans - 1977

"O" cut in SE wing of 115.127 bridge over Beaver Creek - Sta. 7+50.

3.88 864.60 857.93 860.72

6.72 867.65 857.93 857.93

14.8 872.94 853.76 872.94

3.49 881.00 877.51 877.51

Bm # 810 - "□" square

chiseled in top of concrete seawall of catch basin located -382' south of south end of West Bank Rd bridge over Beaver Creek at spillway TP (Bolt)

5.24 882.75 877.01 877.01

Bm # 811 - "□" square

low cut in top of concrete seawall at catch basin located ± 116' north of north end of West Bank Rd bridge over Beaver Creek at spillway

5.94 876.81 876.81 876.81

Bm # 810 - Elev = 877.01
Bm # 811 - Elev = 876.81

~~NA 0 29~~

B

LAKE ELEVATION DATA
(Referenced in the text on page 3)

APPENDIX B

CONTRACT	DESCRIPTION	DATE	AMOUNT	CURRENCY	STATUS
10000001
10000002
10000003
10000004
10000005
10000006
10000007
10000008
10000009
10000010
10000011
10000012
10000013
10000014
10000015
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10000097
10000098
10000099
10000100

Account	Balance	Debit	Credit	Balance
1000000	1000000			1000000
1000001	1000000			1000000
1000002	1000000			1000000
1000003	1000000			1000000
1000004	1000000			1000000
1000005	1000000			1000000
1000006	1000000			1000000
1000007	1000000			1000000
1000008	1000000			1000000
1000009	1000000			1000000
1000010	1000000			1000000
1000011	1000000			1000000
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1000013	1000000			1000000
1000014	1000000			1000000
1000015	1000000			1000000
1000016	1000000			1000000
1000017	1000000			1000000
1000018	1000000			1000000
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1000021	1000000			1000000
1000022	1000000			1000000
1000023	1000000			1000000
1000024	1000000			1000000
1000025	1000000			1000000
1000026	1000000			1000000
1000027	1000000			1000000
1000028	1000000			1000000
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1000030	1000000			1000000
1000031	1000000			1000000
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1000034	1000000			1000000
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1000093	1000000			1000000
1000094	1000000			1000000
1000095	1000000			1000000
1000096	1000000			1000000
1000097	1000000			1000000
1000098	1000000			1000000
1000099	1000000			1000000
1000100	1000000			1000000

DATE	DESCRIPTION	AMOUNT	BALANCE
01/01/00	OPENING BALANCE	100.00	100.00
01/05/00	SALES	50.00	150.00
01/10/00	SALES	75.00	225.00
01/15/00	SALES	100.00	325.00
01/20/00	SALES	125.00	450.00
01/25/00	SALES	150.00	600.00
02/01/00	SALES	175.00	775.00
02/05/00	SALES	200.00	975.00
02/10/00	SALES	225.00	1200.00
02/15/00	SALES	250.00	1450.00
02/20/00	SALES	275.00	1725.00
02/25/00	SALES	300.00	2025.00
03/01/00	SALES	325.00	2350.00
03/05/00	SALES	350.00	2700.00
03/10/00	SALES	375.00	3075.00
03/15/00	SALES	400.00	3475.00
03/20/00	SALES	425.00	3900.00
03/25/00	SALES	450.00	4350.00
04/01/00	SALES	475.00	4825.00
04/05/00	SALES	500.00	5325.00
04/10/00	SALES	525.00	5850.00
04/15/00	SALES	550.00	6400.00
04/20/00	SALES	575.00	6975.00
04/25/00	SALES	600.00	7575.00
05/01/00	SALES	625.00	8200.00
05/05/00	SALES	650.00	8850.00
05/10/00	SALES	675.00	9525.00
05/15/00	SALES	700.00	10225.00
05/20/00	SALES	725.00	10950.00
05/25/00	SALES	750.00	11700.00
06/01/00	SALES	775.00	12475.00
06/05/00	SALES	800.00	13275.00
06/10/00	SALES	825.00	14100.00
06/15/00	SALES	850.00	14950.00
06/20/00	SALES	875.00	15825.00
06/25/00	SALES	900.00	16725.00
07/01/00	SALES	925.00	17650.00
07/05/00	SALES	950.00	18600.00
07/10/00	SALES	975.00	19575.00
07/15/00	SALES	1000.00	20575.00
07/20/00	SALES	1025.00	21600.00
07/25/00	SALES	1050.00	22650.00
08/01/00	SALES	1075.00	23725.00
08/05/00	SALES	1100.00	24825.00
08/10/00	SALES	1125.00	25950.00
08/15/00	SALES	1150.00	27100.00
08/20/00	SALES	1175.00	28275.00
08/25/00	SALES	1200.00	29475.00
09/01/00	SALES	1225.00	30700.00
09/05/00	SALES	1250.00	31950.00
09/10/00	SALES	1275.00	33225.00
09/15/00	SALES	1300.00	34525.00
09/20/00	SALES	1325.00	35850.00
09/25/00	SALES	1350.00	37200.00
10/01/00	SALES	1375.00	38575.00
10/05/00	SALES	1400.00	39975.00
10/10/00	SALES	1425.00	41400.00
10/15/00	SALES	1450.00	42850.00
10/20/00	SALES	1475.00	44325.00
10/25/00	SALES	1500.00	45825.00
11/01/00	SALES	1525.00	47350.00
11/05/00	SALES	1550.00	48900.00
11/10/00	SALES	1575.00	50475.00
11/15/00	SALES	1600.00	52075.00
11/20/00	SALES	1625.00	53700.00
11/25/00	SALES	1650.00	55350.00
12/01/00	SALES	1675.00	57025.00
12/05/00	SALES	1700.00	58725.00
12/10/00	SALES	1725.00	60450.00
12/15/00	SALES	1750.00	62200.00
12/20/00	SALES	1775.00	63975.00
12/25/00	SALES	1800.00	65775.00
12/31/00	CLOSING BALANCE		67600.00

DATE	DESCRIPTION	AMOUNT
10/1/00	10/1/00	10/1/00
10/2/00	10/2/00	10/2/00
10/3/00	10/3/00	10/3/00
10/4/00	10/4/00	10/4/00
10/5/00	10/5/00	10/5/00
10/6/00	10/6/00	10/6/00
10/7/00	10/7/00	10/7/00
10/8/00	10/8/00	10/8/00
10/9/00	10/9/00	10/9/00
10/10/00	10/10/00	10/10/00
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10/28/00	10/28/00	10/28/00
10/29/00	10/29/00	10/29/00
10/30/00	10/30/00	10/30/00
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Case No.	Case Name	Case Type	Case Status	Case Date
10000001	John Doe	Personal	Open	2023-01-01
10000002	Jane Smith	Personal	Closed	2023-01-02
10000003	Bob Johnson	Personal	Open	2023-01-03
10000004	Alice Brown	Personal	Closed	2023-01-04
10000005	Charlie White	Personal	Open	2023-01-05
10000006	Diana Green	Personal	Closed	2023-01-06
10000007	Frank Black	Personal	Open	2023-01-07
10000008	Grace King	Personal	Closed	2023-01-08
10000009	Henry Lee	Personal	Open	2023-01-09
10000010	Ivy Hill	Personal	Closed	2023-01-10
10000011	Jack King	Personal	Open	2023-01-11
10000012	Karen Lee	Personal	Closed	2023-01-12
10000013	Liam Hill	Personal	Open	2023-01-13
10000014	Mia King	Personal	Closed	2023-01-14
10000015	Noah Lee	Personal	Open	2023-01-15
10000016	Olivia Hill	Personal	Closed	2023-01-16
10000017	Peter King	Personal	Open	2023-01-17
10000018	Quinn Lee	Personal	Closed	2023-01-18
10000019	Rachel Hill	Personal	Open	2023-01-19
10000020	Samuel King	Personal	Closed	2023-01-20
10000021	Tina Lee	Personal	Open	2023-01-21
10000022	Uma Hill	Personal	Closed	2023-01-22
10000023	Victor King	Personal	Open	2023-01-23
10000024	Wendy Lee	Personal	Closed	2023-01-24
10000025	Xavier Hill	Personal	Open	2023-01-25
10000026	Yara King	Personal	Closed	2023-01-26
10000027	Zoe Lee	Personal	Open	2023-01-27
10000028	Adam Hill	Personal	Closed	2023-01-28
10000029	Eve King	Personal	Open	2023-01-29
10000030	Frank Lee	Personal	Closed	2023-01-30
10000031	Grace Hill	Personal	Open	2023-01-31
10000032	Henry King	Personal	Closed	2023-02-01
10000033	Ivy Lee	Personal	Open	2023-02-02
10000034	Jack Hill	Personal	Closed	2023-02-03
10000035	Karen King	Personal	Open	2023-02-04
10000036	Liam Lee	Personal	Closed	2023-02-05
10000037	Mia Hill	Personal	Open	2023-02-06
10000038	Noah King	Personal	Closed	2023-02-07
10000039	Olivia Lee	Personal	Open	2023-02-08
10000040	Peter Hill	Personal	Closed	2023-02-09
10000041	Quinn King	Personal	Open	2023-02-10
10000042	Rachel Lee	Personal	Closed	2023-02-11
10000043	Samuel Hill	Personal	Open	2023-02-12
10000044	Tina King	Personal	Closed	2023-02-13
10000045	Uma Lee	Personal	Open	2023-02-14
10000046	Victor Hill	Personal	Closed	2023-02-15
10000047	Wendy King	Personal	Open	2023-02-16
10000048	Xavier Lee	Personal	Closed	2023-02-17
10000049	Yara Hill	Personal	Open	2023-02-18
10000050	Zoe King	Personal	Closed	2023-02-19
10000051	Adam Lee	Personal	Open	2023-02-20
10000052	Eve Hill	Personal	Closed	2023-02-21
10000053	Frank King	Personal	Open	2023-02-22
10000054	Grace Lee	Personal	Closed	2023-02-23
10000055	Henry Hill	Personal	Open	2023-02-24
10000056	Ivy King	Personal	Closed	2023-02-25
10000057	Jack Lee	Personal	Open	2023-02-26
10000058	Karen Hill	Personal	Closed	2023-02-27
10000059	Liam King	Personal	Open	2023-02-28
10000060	Mia Lee	Personal	Closed	2023-02-29
10000061	Noah Hill	Personal	Open	2023-03-01
10000062	Olivia King	Personal	Closed	2023-03-02
10000063	Peter Lee	Personal	Open	2023-03-03
10000064	Quinn Hill	Personal	Closed	2023-03-04
10000065	Rachel King	Personal	Open	2023-03-05
10000066	Samuel Lee	Personal	Closed	2023-03-06
10000067	Tina Hill	Personal	Open	2023-03-07
10000068	Uma King	Personal	Closed	2023-03-08
10000069	Victor Lee	Personal	Open	2023-03-09
10000070	Wendy Hill	Personal	Closed	2023-03-10
10000071	Xavier King	Personal	Open	2023-03-11
10000072	Yara Lee	Personal	Closed	2023-03-12
10000073	Zoe Hill	Personal	Open	2023-03-13
10000074	Adam King	Personal	Closed	2023-03-14
10000075	Eve Lee	Personal	Open	2023-03-15
10000076	Frank Hill	Personal	Closed	2023-03-16
10000077	Grace King	Personal	Open	2023-03-17
10000078	Henry Lee	Personal	Closed	2023-03-18
10000079	Ivy Hill	Personal	Open	2023-03-19
10000080	Jack King	Personal	Closed	2023-03-20
10000081	Karen Lee	Personal	Open	2023-03-21
10000082	Liam Hill	Personal	Closed	2023-03-22
10000083	Mia King	Personal	Open	2023-03-23
10000084	Noah Lee	Personal	Closed	2023-03-24
10000085	Olivia Hill	Personal	Open	2023-03-25
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10000087	Quinn Lee	Personal	Open	2023-03-27
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10000089	Samuel King	Personal	Open	2023-03-29
10000090	Tina Lee	Personal	Closed	2023-03-30
10000091	Uma Hill	Personal	Open	2023-03-31
10000092	Victor King	Personal	Closed	2023-04-01
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10000094	Xavier Hill	Personal	Closed	2023-04-03
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10000096	Zoe Lee	Personal	Closed	2023-04-05
10000097	Adam Hill	Personal	Open	2023-04-06
10000098	Eve King	Personal	Closed	2023-04-07
10000099	Frank Lee	Personal	Open	2023-04-08
10000100	Grace Hill	Personal	Closed	2023-04-09

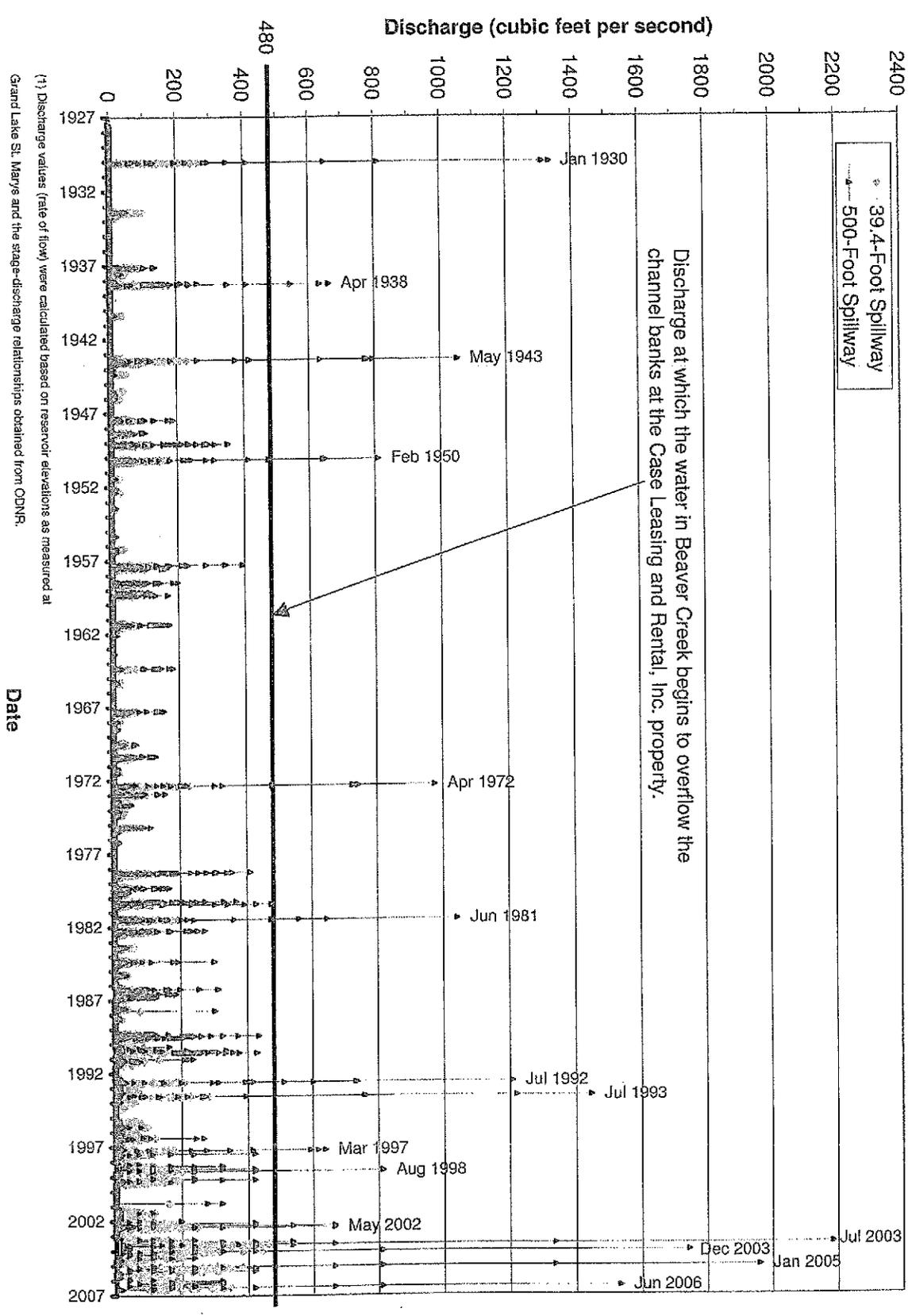
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11	01/11/01	11000.00	PAID	
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13	01/13/01	13000.00	PAID	
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15	01/15/01	15000.00	PAID	
16	01/16/01	16000.00	PAID	
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19	01/19/01	19000.00	PAID	
20	01/20/01	20000.00	PAID	
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88	01/88/01	88000.00	PAID	
89	01/89/01	89000.00	PAID	
90	01/90/01	90000.00	PAID	
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97	01/97/01	97000.00	PAID	
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C

REVISED FIGURE 3 FROM THE CRA MAY 2006 REPORT
(Referenced in the text on page 3)

APPENDIX C

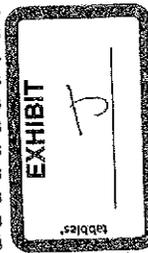
Revised Figure 3
 Grand Lake St. Marys
 Calculated Discharges into Beaver Creek⁽¹⁾



Recorded Pool Levels during non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
7	7/1/1988	-10 EB		869.47
7	7/2/1988	-10.5 EB		869.43
7	7/3/1988	-10.5 EB		869.43
7	7/4/1988	-11 EB		869.39
7	7/5/1988	-11.5 EB		869.35
7	7/6/1988	-12 EB		869.31
7	7/7/1988	-12 EB		869.31
7	7/8/1988	-12.5 EB		869.27
7	7/9/1988	-12.5 EB		869.27
7	7/10/1988	-12.5 EB		869.27
7	7/11/1988	-12.5 EB		869.27
7	7/12/1988	-12.5 EB		869.27
7	7/13/1988	-12.5 EB		869.27
7	7/14/1988	-13 EB		869.22
7	7/15/1988	-13 EB		869.22
7	7/16/1988	-13 EB		869.22
7	7/17/1988	-13.5 EB		869.18
7	7/18/1988	-14 EB		869.14
7	7/19/1988	-13 EB		869.22
7	7/20/1988	-12.5 EB		869.27
7	7/21/1988	-12 EB		869.31
7	7/22/1988	-12 EB		869.31
7	7/23/1988	-12 EB		869.31
7	7/24/1988	-12 EB		869.31
7	7/25/1988	-12 EB		869.31
7	7/26/1988	-12 EB		869.31
7	7/27/1988	-12 EB		869.31
7	7/28/1988	-12 EB		869.31
7	7/29/1988	-12 EB		869.31
7	7/30/1988	-12.5 EB		869.27
7	7/31/1988	-12.5 EB		869.27
8	8/1/1988	-12.5 EB		869.27
8	8/2/1988	-13 EB		869.22
8	8/3/1988	-13 EB		869.22
8	8/4/1988	-13.5 EB		869.18
8	8/5/1988	-13.5 EB		869.18
8	8/6/1988	-14 EB		869.14
8	8/7/1988	-14 EB		869.14
8	8/8/1988	-14 EB		869.14
8	8/9/1988	-14.7 EB		869.08
8	8/10/1988	-14.5 EB		869.1
8	8/11/1988	-14.5 EB		869.1
8	8/12/1988	-15 EB		869.06
8	8/13/1988	-15 EB		869.06
8	8/14/1988	-15.5 EB		869.02
8	8/15/1988	-15.5 EB		869.02
8	8/16/1988	-15.5 EB		869.02
8	8/17/1988	-15.5 EB		869.02
8	8/18/1988	-15.5 EB		869.02
8	8/19/1988	-14.5 EB		869.1
8	8/20/1988	-14.5 EB		869.1
8	8/21/1988	-15 EB		869.06
8	8/22/1988	-15 EB		869.06
8	8/23/1988	-15 EB		869.06
8	8/24/1988	-15 EB		869.06
8	8/25/1988	-15 EB		869.06
8	8/26/1988	-15 EB		869.06
8	8/27/1988	-15 EB		869.06
8	8/28/1988	-15 EB		869.06
8	8/29/1988	-15 EB		869.06
8	8/30/1988	-15 EB		869.06
8	8/31/1988	-15 EB		869.06
9	9/1/1988	-16 EB		868.97
9	9/2/1988	-16 EB		868.97
9	9/3/1988	-16 EB		868.97
9	9/4/1988	-16 EB		868.97
9	9/5/1988	-16 EB		868.97
9	9/6/1988	-16 EB		868.97
9	9/7/1988	-16 EB		868.97
9	9/8/1988	-16 EB		868.97
9	9/9/1988	-16.5 EB		868.93
9	9/10/1988	-16.5 EB		868.93



Recorded Pool Levels during non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
4	4/4/1998	15 EB		871.56
4	4/6/1998	16 EB		871.64
4	4/15/1998	17 EB		871.72
4	4/20/1998	16 EB		871.64
4	4/21/1998	14 EB		871.47
5	5/4/1998	14 EB		871.47
5	5/20/1998	11.5 EB		871.27
5	5/29/1998	11 EB		871.22
6	6/15/1998	18 EB		871.81
6	6/22/1998	17 EB		871.72
6	6/29/1998	16 EB		871.64
7	7/6/1998	14 EB		871.47
7	7/9/1998	15 EB		871.56
7	7/14/1998	13 EB		871.39
7	7/16/1998	12 EB		871.31
7	7/20/1998	12 EB		871.31
7	7/23/1998	21 EB		872.06
7	7/27/1998	18 EB		871.81
8	8/4/1998	13 EB		871.39
8	8/5/1998	16 EB		871.64
8	8/6/1998	18 EB		871.81
8	8/7/1998	21 EB		872.06
8	8/10/1998	18 EB		871.81
8	8/17/1998	14 EB		871.47
8	8/19/1998	12 EB		871.31
8	8/25/1998	10 EB		871.14
8	8/31/1998	8 EB		870.97
9	9/10/1998	6 EB		870.81
9	9/21/1998	5 EB		870.72
9	9/29/1998	3 EB		870.56
10	10/16/1998	2 EB		870.47
10	10/26/1998	1 EB		870.39
10	10/30/1998	1 EB		870.39
4	4/7/1999	12 EB		871.31
4	4/13/1999	11 EB		871.22
4	4/19/1999	12 EB		871.31
4	4/26/1999	12 EB		871.31
4	4/30/1999	15 EB		871.56
5	5/3/1999	13 EB		871.39
5	5/10/1999	11 EB		871.22
5	5/12/1999	11 EB		871.22
5	5/18/1999	11 EB		871.22
5	5/26/1999	10 EB		871.14
5	5/28/1999	9 EB		871.06
6	6/8/1999	8 EB		870.97
6	6/9/1999	7 EB		870.89
6	6/21/1999	5 EB		870.72
6	6/28/1999	5 EB		870.72
7	7/6/1999	3 EB		870.56
7	7/13/1999	0 EB		870.31
7	7/19/1999	0 EB		870.31
7	7/23/1999	-2 EB		870.14
7	7/30/1999	-2 EB		870.14
8	8/9/1999	-5 EB		869.89
8	8/12/1999	-6 EB		869.81
8	8/24/1999	-8 EB		869.64
9	9/1/1999	-10 EB		869.47
9	9/3/1999	-12 EB		869.31
9	9/10/1999	-12 EB		869.31
9	9/16/1999	-13 EB		869.22
9	9/22/1999	-14 EB		869.14
9	9/27/1999	-16 EB		868.97
10	10/14/1999	-16 EB		868.97
10	10/19/1999	-16 EB		868.97
4	4/1/2000	-18 BH		869.26
4	4/3/2000	-11 EB		869.39
4	4/9/2000	-7 EB		869.72
4	4/17/2000	-12 BH		869.76
4	4/19/2000	-6 EB		869.81
4	4/24/2000	-4 EB		869.97
5	5/1/2000	-11 EB		869.39
5	5/2/2000	-10 EB		869.47

Recorded Pool Levels during non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
9	9/11/1988	-17 EB		868.89
9	9/12/1988	-17 EB		868.89
9	9/13/1988	-17 EB		868.89
9	9/14/1988	-16 EB		868.97
9	9/15/1988	-16 EB		868.97
9	9/16/1988	-16 EB		868.97
9	9/17/1988	-16 EB		868.97
9	9/18/1988	-16 EB		868.97
9	9/19/1988	-15.5 EB		869.02
9	9/20/1988	-15.5 EB		869.02
9	9/21/1988	-15.5 EB		869.02
9	9/22/1988	-15.5 EB		869.02
9	9/23/1988	-15.5 EB		869.02
9	9/24/1988	-15.5 EB		869.02
9	9/25/1988	-15.5 EB		869.02
9	9/26/1988	-15.5 EB		869.02
9	9/27/1988	-15.5 EB		869.02
9	9/28/1988	-15.5 EB		869.02
9	9/29/1988	-15.5 EB		869.02
9	9/30/1988	-15.5 EB		869.02
10	10/1/1988	-15.5 EB		869.02
10	10/2/1988	-16 EB		868.97
10	10/3/1988	-16 EB		868.97
10	10/4/1988	-16.5 EB		868.93
10	10/5/1988	-16.5 EB		868.93
10	10/6/1988	-17 EB		868.89
10	10/7/1988	-17.5 EB		868.85
10	10/8/1988	-17.5 EB		868.85
10	10/9/1988	-17.5 EB		868.85
10	10/10/1988	-17.5 EB		868.85
10	10/11/1988	-18 EB		868.81
10	10/12/1988	-18 EB		868.81
10	10/13/1988	-18 EB		868.81
10	10/14/1988	-18 EB		868.81
10	10/15/1988	-18 EB		868.81
10	10/16/1988	-18 EB		868.81
10	10/17/1988	-18 EB		868.81
10	10/18/1988	-18 EB		868.81
10	10/19/1988	-18 EB		868.81
10	10/20/1988	-18 EB		868.81
10	10/21/1988	-18 EB		868.81
10	10/22/1988	-18 EB		868.81
10	10/23/1988	-18 EB		868.81
10	10/24/1988	-18 EB		868.81
10	10/25/1988	-18 EB		868.81
10	10/26/1988	-18 EB		868.81
10	10/27/1988	-18 EB		868.81
10	10/28/1988	-18 EB		868.81
10	10/29/1988	-18 EB		868.81
10	10/30/1988	-18 EB		868.81
10	10/31/1988	-20 EB		868.64
4	4/1/1989	7 EB		870.89
4	4/2/1989	8 EB		870.97
4	4/3/1989	9 EB		871.06
4	4/4/1989	10 EB		871.14
4	4/5/1989	11 EB		871.22
4	4/6/1989	13 EB		871.39
4	4/7/1989	13 EB		871.39
4	4/8/1989	13 EB		871.39
4	4/9/1989	13 EB		871.39
4	4/10/1989	13 EB		871.39
4	4/11/1989	13.5 EB		871.43
4	4/12/1989	13.5 EB		871.43
4	4/13/1989	13.5 EB		871.43
4	4/14/1989	13.5 EB		871.43
4	4/15/1989	13.5 EB		871.43
4	4/16/1989	13 EB		871.39
4	4/17/1989	13 EB		871.39
4	4/18/1989	13 EB		871.39
4	4/19/1989	13.5 EB		871.43
4	4/20/1989	13.5 EB		871.43
4	4/21/1989	13 EB		871.39

Recorded Pool Levels during non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
5	5/19/2000	-19.5 BH		869.14
5	5/22/2000	-11 EB		869.39
5	5/30/2000	-11 EB		869.39
6	6/6/2000	-11.5 WB		869.64
6	6/8/2000	-4 EB		869.97
6	6/17/2000	-11.5 WB		869.64
6	6/19/2000	-3 EB		870.06
6	6/22/2000	-8 WB		869.93
6	6/23/2000	-2 EB		870.14
6	6/27/2000	-7 BH		870.18
7	7/10/2000	-2 EB		870.14
7	7/24/2000	-6 EB		869.81
7	7/26/2000	-12.5 WB		869.56
7	7/31/2000	-6 EB		869.81
8	8/3/2000	-6 EB		869.81
8	8/10/2000	-6 EB		869.81
8	8/21/2000	-7.5 EB		869.68
8	8/29/2000	-7 EB		869.72
9	9/1/2000	-14 BH		869.6
9	9/7/2000	-9 EB		869.56
9	9/14/2000	-7.5 EB		869.68
9	9/26/2000	-7 EB		869.72
10	10/3/2000	-8 EB		869.64
10	10/5/2000	13.5 WB		871.73
10	10/6/2000	13 WB		871.68
10	10/17/2000	-14 WB		869.43
4	4/19/2001	3 WB		870.85
4	4/25/2001	3.5 WB		870.89
5	5/8/2001	8 EB		870.97
5	5/15/2001	0.5 BH		870.81
5	5/16/2001	2 BH		870.93
5	5/17/2001	3.5 BH		871.06
5	5/19/2001	5 BH		871.18
5	5/27/2001	14 EB		871.47
6	6/4/2001	14 EB		871.47
6	6/5/2001	7 WB		871.18
6	6/14/2001	13 EB		871.39
6	6/19/2001	4.5 BH		871.14
6	6/25/2001	10 EB		871.14
6	6/27/2001	3 WB		870.85
7	7/6/2001	1.5 WB		870.73
7	7/15/2001	-0.5 WB		870.56
7	7/17/2001	6 WB		871.1
7	7/19/2001	-1 WB		870.52
7	7/21/2001	0 WB		870.6
7	7/22/2001	1 WB		870.68
7	7/31/2001	8 EB		870.97
8	8/4/2001	1 WB		870.68
8	8/8/2001	-0.5 EB		870.27
8	8/13/2001	5.5 EB		870.77
8	8/23/2001	5 EB		870.72
8	8/27/2001	5 EB		870.72
8	8/29/2001	-2 WB		870.43
9	9/11/2001	3 EB		870.56
9	9/17/2001	2 EB		870.47
10	10/1/2001	3 EB		870.56
10	10/22/2001	7 EB		870.89
4	4/8/2002	17 EB		871.72
4	4/10/2002	19 EB		871.89
4	4/13/2002	20 EB		871.97
4	4/17/2002	20 EB		871.97
4	4/19/2002	19 EB		871.89
4	4/27/2002	16 EB		871.64
5	5/1/2002	9 WB		871.35
5	5/4/2002	16 EB		871.64
5	5/8/2002	8 WB		871.27
5	5/15/2002	20 EB		871.97
5	5/21/2002	17 EB		871.72
5	5/28/2002	14 EB		871.47
5	5/29/2002	16 EB		871.64
6	6/7/2002	13 EB		871.39
6	6/10/2002	13 EB		871.39

Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
4	4/22/1989	13 EB	13 EB	871.39
4	4/23/1989	13 EB	13 EB	871.39
4	4/24/1989	12.5 EB	12.5 EB	871.35
4	4/25/1989	12.5 EB	12.5 EB	871.35
4	4/26/1989	14 EB	14 EB	871.47
4	4/27/1989	15 EB	15 EB	871.56
4	4/28/1989	0 EB	0 EB	870.31
4	4/29/1989	0 EB	0 EB	870.31
4	4/30/1989	0 EB	0 EB	870.31
5	5/1/1989	13.5 EB	13.5 EB	871.43
5	5/2/1989	13 EB	13 EB	871.39
5	5/3/1989	13 EB	13 EB	871.39
5	5/4/1989	13 EB	13 EB	871.39
5	5/5/1989	13 EB	13 EB	871.39
5	5/6/1989	12.5 EB	12.5 EB	871.35
5	5/7/1989	12.5 EB	12.5 EB	871.35
5	5/8/1989	12 EB	12 EB	871.31
5	5/9/1989	12 EB	12 EB	871.31
5	5/10/1989	12.5 EB	12.5 EB	871.35
5	5/11/1989	13 EB	13 EB	871.39
5	5/12/1989	13 EB	13 EB	871.39
5	5/13/1989	13 EB	13 EB	871.39
5	5/14/1989	12.5 EB	12.5 EB	871.35
5	5/15/1989	12.5 EB	12.5 EB	871.35
5	5/16/1989	12 EB	12 EB	871.31
5	5/17/1989	12 EB	12 EB	871.31
5	5/18/1989	12 EB	12 EB	871.31
5	5/19/1989	12 EB	12 EB	871.31
5	5/20/1989	12 EB	12 EB	871.31
5	5/21/1989	12 EB	12 EB	871.31
5	5/22/1989	12 EB	12 EB	871.31
5	5/23/1989	12 EB	12 EB	871.31
5	5/24/1989	12 EB	12 EB	871.31
5	5/25/1989	12 EB	12 EB	871.31
5	5/26/1989	18 EB	18 EB	871.81
5	5/27/1989	18 EB	18 EB	871.81
5	5/28/1989	18 EB	18 EB	871.81
5	5/29/1989	18 EB	18 EB	871.81
5	5/30/1989	18 EB	18 EB	871.81
5	5/31/1989	18 EB	18 EB	871.81
6	6/1/1989	18 EB	18 EB	871.81
6	6/2/1989	18 EB	18 EB	871.81
6	6/3/1989	18.5 EB	18.5 EB	871.85
6	6/4/1989	18.5 EB	18.5 EB	871.85
6	6/5/1989	19 EB	19 EB	871.89
6	6/6/1989	19.5 EB	19.5 EB	871.93
6	6/7/1989	19 EB	19 EB	871.89
6	6/8/1989	18 EB	18 EB	871.81
6	6/9/1989	18 EB	18 EB	871.81
6	6/10/1989	18 EB	18 EB	871.81
6	6/11/1989	17.5 EB	17.5 EB	871.77
6	6/12/1989	17 EB	17 EB	871.72
6	6/13/1989	16 EB	16 EB	871.64
6	6/14/1989	15 EB	15 EB	871.56
6	6/15/1989	14 EB	14 EB	871.47
6	6/16/1989	13.5 EB	13.5 EB	871.43
6	6/17/1989	13 EB	13 EB	871.39
6	6/18/1989	12.5 EB	12.5 EB	871.35
6	6/19/1989	12 EB	12 EB	871.31
6	6/20/1989	11.5 EB	11.5 EB	871.27
6	6/21/1989	11 EB	11 EB	871.22
6	6/22/1989	11 EB	11 EB	871.22
6	6/23/1989	11 EB	11 EB	871.22
6	6/24/1989	11 EB	11 EB	871.22
6	6/25/1989	11 EB	11 EB	871.22
6	6/26/1989	11 EB	11 EB	871.22
6	6/27/1989	11 EB	11 EB	871.22
6	6/28/1989	11 EB	11 EB	871.22
6	6/29/1989	11.5 EB	11.5 EB	871.27
6	6/30/1989	11.5 EB	11.5 EB	871.27
7	7/1/1989	11 EB	11 EB	871.22
7	7/2/1989	11 EB	11 EB	871.22

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
6	6/13/2002	12 EB	12 EB	871.31
6	6/17/2002	11 EB	11 EB	871.22
6	6/20/2002	10 EB	10 EB	871.14
6	6/21/2002	10 EB	10 EB	871.14
6	6/28/2002	9 EB	9 EB	871.06
7	7/1/2002	8 EB	8 EB	870.97
7	7/15/2002	4 EB	4 EB	870.64
7	7/23/2002	3 EB	3 EB	870.56
8	8/1/2002	1 EB	1 EB	870.39
8	8/5/2002	0 EB	0 EB	870.31
8	8/6/2002	-6.5 WB	-6.5 WB	870.06
8	8/14/2002	-8.5 EB	-8.5 EB	869.6
8	8/26/2002	-3 EB	-3 EB	870.06
9	9/9/2002	-6 EB	-6 EB	869.81
9	9/16/2002	-7 EB	-7 EB	869.72
9	9/23/2002	-7.5 EB	-7.5 EB	869.68
10	10/8/2002	-8 EB	-8 EB	869.64
10	10/15/2002	-8 EB	-8 EB	869.64
10	10/22/2002	-8.5 EB	-8.5 EB	869.6
4	4/13/2003	15 EB	15 EB	871.56
4	4/20/2003	13 EB	13 EB	871.39
5	5/6/2003	14 EB	14 EB	871.47
5	5/9/2003	17 EB	17 EB	871.72
5	5/13/2003	19 EB	19 EB	871.89
5	5/16/2003	18 EB	18 EB	871.81
7	7/2/2003	11 EB	11 EB	871.22
7	7/8/2003	24 EB	24 EB	872.31
7	7/9/2003	28 EB	28 EB	872.64
7	7/10/2003	28 EB	28 EB	872.64
7	7/12/2003	20 EB	20 EB	871.97
7	7/13/2003	20 EB	20 EB	871.97
7	7/14/2003	20 EB	20 EB	871.97
7	7/17/2003	17.5 EB	17.5 EB	871.77
7	7/22/2003	17 EB	17 EB	871.72
7	7/24/2003	18 EB	18 EB	871.81
7	7/25/2003	17 EB	17 EB	871.72
7	7/29/2003	15.5 EB	15.5 EB	871.6
7	7/31/2003	14.5 EB	14.5 EB	871.52
8	8/3/2003	19 EB	19 EB	871.89
8	8/4/2003	19 EB	19 EB	871.89
8	8/6/2003	18 EB	18 EB	871.81
8	8/8/2003	17 EB	17 EB	871.72
8	8/9/2003	16 EB	16 EB	871.64
8	8/10/2003	16 EB	16 EB	871.64
8	8/11/2003	16 EB	16 EB	871.64
8	8/14/2003	15 EB	15 EB	871.56
8	8/22/2003	12 EB	12 EB	871.31
8	8/27/2003	11 EB	11 EB	871.22
8	8/30/2003	16 EB	16 EB	871.64
8	8/31/2003	16 EB	16 EB	871.64
9	9/1/2003	16 EB	16 EB	871.64
9	9/3/2003	18 EB	18 EB	871.81
9	9/6/2003	15 EB	15 EB	871.56
9	9/7/2003	15 EB	15 EB	871.56
9	9/8/2003	15 EB	15 EB	871.56
9	9/10/2003	14 EB	14 EB	871.47
9	9/12/2003	14 EB	14 EB	871.47
9	9/17/2003	12 EB	12 EB	871.31
9	9/26/2003	11 EB	11 EB	871.22
10	10/2/2003	12 EB	12 EB	871.31
10	10/4/2003	12 EB	12 EB	871.31
10	10/5/2003	12 EB	12 EB	871.31
10	10/6/2003	12 EB	12 EB	871.31
10	10/8/2003	12 EB	12 EB	871.31
10	10/11/2003	12 EB	12 EB	871.31
10	10/12/2003	12 EB	12 EB	871.31
10	10/13/2003	12 EB	12 EB	871.31
10	10/14/2003	12 EB	12 EB	871.31
10	10/27/2003	12 EB	12 EB	871.31
4	4/7/2004	13 EB	13 EB	871.39
4	4/15/2004	12 EB	12 EB	871.31
5	5/11/2004	10 EB	10 EB	871.14

Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is		5.00 in.		
Average Pool Level is		870.72 NGVD		
Month	Date	Gage Measurement	Gage Location	Pool Level
7	7/3/1989	10.5	EB	871.18
7	7/4/1989	10.5	EB	871.18
7	7/5/1989	10	EB	871.14
7	7/6/1989	10	EB	871.14
7	7/7/1989	10	EB	871.14
7	7/8/1989	10	EB	871.14
7	7/9/1989	10	EB	871.14
7	7/10/1989	10	EB	871.14
7	7/11/1989	10	EB	871.14
7	7/12/1989	9.5	EB	871.1
7	7/13/1989	9.5	EB	871.1
7	7/14/1989	9.5	EB	871.1
7	7/15/1989	9	EB	871.06
7	7/16/1989	9	EB	871.06
7	7/17/1989	14	EB	871.47
7	7/18/1989	16.5	EB	871.68
7	7/19/1989	17	EB	871.72
7	7/20/1989	17	EB	871.72
7	7/21/1989	16.5	EB	871.68
7	7/22/1989	17	EB	871.72
7	7/23/1989	17	EB	871.72
7	7/24/1989	16.5	EB	871.68
7	7/25/1989	16	EB	871.64
7	7/26/1989	16	EB	871.64
7	7/27/1989	16	EB	871.64
7	7/28/1989	15.5	EB	871.6
7	7/29/1989	15.5	EB	871.6
7	7/30/1989	15	EB	871.56
7	7/31/1989	14	EB	871.47
8	8/1/1989	13.5	EB	871.43
8	8/2/1989	13	EB	871.39
8	8/3/1989	13	EB	871.39
8	8/4/1989	12.5	EB	871.35
8	8/5/1989	12.5	EB	871.35
8	8/6/1989	12	EB	871.31
8	8/7/1989	12	EB	871.31
8	8/8/1989	11	EB	871.22
8	8/9/1989	10.5	EB	871.18
8	8/10/1989	10	EB	871.14
8	8/11/1989	9.5	EB	871.1
8	8/12/1989	9	EB	871.06
8	8/13/1989	8.5	EB	871.02
8	8/14/1989	8	EB	870.97
8	8/15/1989	8	EB	870.97
8	8/16/1989	8	EB	870.97
8	8/17/1989	7.5	EB	870.93
8	8/18/1989	7.5	EB	870.93
8	8/19/1989	7	EB	870.89
8	8/20/1989	6.5	EB	870.85
8	8/21/1989	6	EB	870.81
8	8/22/1989	5.5	EB	870.77
8	8/23/1989	5.5	EB	870.77
8	8/24/1989	5.5	EB	870.77
8	8/25/1989	5	EB	870.72
8	8/26/1989	5	EB	870.72
8	8/27/1989	4	EB	870.64
8	8/28/1989	4	EB	870.64
8	8/29/1989	4	EB	870.64
8	8/30/1989	4	EB	870.64
8	8/31/1989	4	EB	870.64
9	9/1/1989	3.5	EB	870.6
9	9/2/1989	3.5	EB	870.6
9	9/3/1989	3.5	EB	870.6
9	9/4/1989	3	EB	870.56
9	9/5/1989	3	EB	870.56
9	9/6/1989	2.5	EB	870.52
9	9/7/1989	2	EB	870.47
9	9/8/1989	2	EB	870.47
9	9/9/1989	2	EB	870.47
9	9/10/1989	2	EB	870.47
9	9/11/1989	2	EB	870.47
9	9/12/1989	2	EB	870.47

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is		7.42 in.		
Average Pool Level is		870.96 NGVD		
Month	Date	Gage Measurement	Gage Location	Pool Level
6	6/3/2004	10	EB	871.14
6	6/13/2004	14	EB	871.47
6	6/16/2004	16	EB	871.64
6	6/23/2004	15	EB	871.56
6	6/30/2004	13	EB	871.39
7	7/9/2004	10	EB	871.14
7	7/17/2004	8	EB	870.97
7	7/18/2004	8	EB	870.97
7	7/19/2004	8	EB	870.97
7	7/28/2004	8	EB	870.97
8	8/3/2004	8	EB	870.97
8	8/14/2004	6	EB	870.81
8	8/15/2004	6	EB	870.81
8	8/16/2004	6	EB	870.81
8	8/21/2004	6	EB	870.81
8	8/22/2004	6	EB	870.81
8	8/23/2004	6	EB	870.81
8	8/31/2004	6	EB	870.81
9	9/10/2004	4	EB	870.64
9	9/21/2004	2	EB	870.47
10	10/7/2004	0	EB	870.31
10	10/21/2004	0	EB	870.31
4	4/4/2005	14	EB	871.47
4	4/22/2005	12	EB	871.31
4	4/26/2005	18	EB	871.81
4	4/28/2005	18	EB	871.81
5	5/8/2005	15	EB	871.56
5	5/11/2005	14	EB	871.47
5	5/16/2005	16	EB	871.64
5	5/17/2005	12	EB	871.31
5	5/26/2005	12	EB	871.31
5	5/31/2005	10	EB	871.14
6	6/7/2005	10	EB	871.14
6	6/21/2005	7	EB	870.89
6	6/28/2005	5	EB	870.72
6	6/30/2005	8	EB	870.97
7	7/8/2005	6	EB	870.81
7	7/15/2005	4	EB	870.64
7	7/28/2005	4	EB	870.64
8	8/2/2005	2	EB	870.47
8	8/17/2005	1	EB	870.39
8	8/26/2005	-1	EB	870.22
8	8/29/2005	-2	EB	870.14
9	9/1/2005	0	EB	870.31
9	9/13/2005	-1	EB	870.22
9	9/21/2005	0	EB	870.31
9	9/24/2005	2	EB	870.47
9	9/30/2005	8	EB	870.97
10	10/4/2005	7	EB	870.89
10	10/13/2005	6	EB	870.81
10	10/27/2005	7	EB	870.89
4	4/15/2006	16	EB	871.64
4	4/20/2006	15	EB	871.56
5	5/3/2006	12	EB	871.31
5	5/6/2006	12	EB	871.31
5	5/7/2006	12	EB	871.31
5	5/8/2006	12	EB	871.31
5	5/13/2006	16	EB	871.64
5	5/14/2006	16	EB	871.64
5	5/15/2006	16	EB	871.64
5	5/23/2006	15	EB	871.56
6	6/3/2006	25	EB	872.39
6	6/4/2006	21	EB	872.06
6	6/5/2006	21	EB	872.06
6	6/8/2006	20	EB	871.97
6	6/10/2006	18	EB	871.81
6	6/11/2006	18	EB	871.81
6	6/12/2006	18	EB	871.81
6	6/14/2006	17	EB	871.72
6	6/20/2006	14	EB	871.47
6	6/23/2006	15	EB	871.56
6	6/26/2006	14	EB	871.47

Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
9	9/13/1989	2	EB	870.47
9	9/14/1989	2	EB	870.47
9	9/15/1989	3	EB	870.56
9	9/16/1989	3.5	EB	870.6
9	9/17/1989	3.5	EB	870.6
9	9/18/1989	4	EB	870.64
9	9/19/1989	4	EB	870.64
9	9/20/1989	4	EB	870.64
9	9/21/1989	4	EB	870.64
9	9/22/1989	4	EB	870.64
9	9/23/1989	4	EB	870.64
9	9/24/1989	4	EB	870.64
9	9/25/1989	4	EB	870.64
9	9/26/1989	4	EB	870.64
9	9/27/1989	4	EB	870.64
9	9/28/1989	4	EB	870.64
9	9/29/1989	3	EB	870.56
9	9/30/1989	3	EB	870.56
10	10/1/1989	3.5	EB	870.6
10	10/2/1989	3.5	EB	870.6
10	10/3/1989	3	EB	870.56
10	10/4/1989	3	EB	870.56
10	10/5/1989	2.5	EB	870.52
10	10/6/1989	2.5	EB	870.52
10	10/7/1989	2	EB	870.47
10	10/8/1989	1.5	EB	870.43
10	10/9/1989	1.5	EB	870.43
10	10/10/1989	0	EB	870.31
10	10/11/1989	0	EB	870.31
10	10/12/1989	0	EB	870.31
10	10/13/1989	0	EB	870.31
10	10/14/1989	0	EB	870.31
10	10/15/1989	0	EB	870.31
10	10/16/1989	0	EB	870.31
10	10/17/1989	0	EB	870.31
10	10/18/1989	0	EB	870.31
10	10/19/1989	0	EB	870.31
10	10/20/1989	0	EB	870.31
10	10/21/1989	0	EB	870.31
10	10/22/1989	0	EB	870.31
10	10/23/1989	0	EB	870.31
10	10/24/1989	0.5	EB	870.35
10	10/25/1989	0.5	EB	870.35
10	10/26/1989	0.5	EB	870.35
10	10/27/1989	0.5	EB	870.35
10	10/28/1989	0.5	EB	870.35
10	10/29/1989	0.5	EB	870.35
10	10/30/1989	0.5	EB	870.35
10	10/31/1989	0.5	EB	870.35
4	4/13/1990	13	EB	871.39
4	4/16/1990	14	EB	871.47
4	4/19/1990	13	EB	871.39
4	4/23/1990	12	EB	871.31
4	4/30/1990	11	EB	871.22
5	5/13/1990	14	EB	871.47
5	5/14/1990	15	EB	871.56
5	5/21/1990	18	EB	871.81
5	5/23/1990	17	EB	871.72
5	5/30/1990	15	EB	871.56
6	6/4/1990	14	EB	871.47
6	6/7/1990	12	EB	871.31
6	6/11/1990	16	EB	871.64
6	6/25/1990	12	EB	871.31
7	7/1/1990	12	EB	871.31
7	7/2/1990	12	EB	871.31
7	7/3/1990	12	EB	871.31
7	7/4/1990	12	EB	871.31
7	7/5/1990	12	EB	871.31
7	7/6/1990	12	EB	871.31
7	7/7/1990	12	EB	871.31
7	7/8/1990	12	EB	871.31
7	7/9/1990	12	EB	871.31

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare simillar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
7	7/7/2006	10	EB	871.14
7	7/13/2006	10	EB	871.14
7	7/19/2006	10	EB	871.14
7	7/22/2006	9	EB	871.06
7	7/23/2006	9	EB	871.06
7	7/24/2006	9	EB	871.06
8	8/3/2006	14	EB	871.47
8	8/10/2006	11	EB	871.22
8	8/17/2006	8	EB	870.97
8	8/19/2006	8	EB	870.97
8	8/20/2006	8	EB	870.97
8	8/21/2006	8	EB	870.97
Average		7.42		870.96

Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
7	7/10/1990	9 EB		871.06
7	7/11/1990	9 EB		871.06
7	7/12/1990	9 EB		871.06
7	7/13/1990	9 EB		871.06
7	7/14/1990	18 EB		871.81
7	7/15/1990	18 EB		871.81
7	7/16/1990	18 EB		871.81
7	7/17/1990	18 EB		871.81
7	7/18/1990	18 EB		871.81
7	7/19/1990	18 EB		871.81
7	7/20/1990	18 EB		871.81
7	7/21/1990	18 EB		871.81
7	7/22/1990	18 EB		871.81
7	7/23/1990	21 EB		872.06
7	7/24/1990	21 EB		872.06
7	7/25/1990	21 EB		872.06
7	7/26/1990	20.5 EB		872.02
7	7/27/1990	20.5 EB		872.02
7	7/28/1990	20.5 EB		872.02
7	7/29/1990	20.5 EB		872.02
7	7/30/1990	20.5 EB		872.02
7	7/31/1990	20.5 EB		872.02
8	8/7/1990	13 EB		871.39
8	8/8/1990	13 EB		871.39
8	8/10/1990	12 EB		871.31
8	8/17/1990	11 EB		871.22
8	8/20/1990	12 EB		871.31
8	8/23/1990	14 EB		871.47
8	8/27/1990	13.5 EB		871.43
9	9/11/1990	12 EB		871.31
9	9/20/1990	11 EB		871.22
9	9/27/1990	9.5 EB		871.1
10	10/1/1990	8 EB		870.97
10	10/12/1990	10 EB		871.14
10	10/16/1990	10 EB		871.14
10	10/22/1990	10 EB		871.14
10	10/29/1990	9 EB		871.06
4	4/2/1991	10 EB		871.14
4	4/11/1991	7 EB		870.89
4	4/25/1991	10 EB		871.14
5	5/3/1991	9.5 EB		871.1
5	5/22/1991	7.5 EB		870.93
6	6/3/1991	11.5 EB		871.27
6	6/16/1991	8 EB		870.97
6	6/26/1991	5 EB		870.72
7	7/8/1991	5 EB		870.72
7	7/19/1991	3 EB		870.56
7	7/26/1991	2 EB		870.47
8	8/1/1991	0 EB		870.31
8	8/7/1991	-2 EB		870.14
8	8/12/1991	-3 EB		870.06
8	8/23/1991	-3.5 EB		870.02
8	8/26/1991	-4 EB		869.97
9	9/19/1991	-6 EB		869.81
9	9/30/1991	-8 EB		869.64
10	10/16/1991	-10 EB		869.47
10	10/30/1991	-9 EB		869.56
4	4/6/1992	-1 EB		870.22
4	4/20/1992	2 EB		870.47
4	4/22/1992	6.5 EB		870.85
4	4/28/1992	6 EB		870.81
5	5/18/1992	5.5 EB		870.77
5	5/28/1992	4 EB		870.64
6	6/8/1992	5 EB		870.72
6	6/16/1992	4 EB		870.64
6	6/22/1992	6 EB		870.81
7	7/13/1992	12 EB		871.31
7	7/15/1992	18.5 EB		871.85
7	7/19/1992	24.5 EB		872.35
7	7/21/1992	23.5 EB		872.27
7	7/22/1992	22 EB		872.14
7	7/24/1992	25 EB		872.39

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
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Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
7	7/25/1992		25 EB	872.39
7	7/26/1992		25 EB	872.39
7	7/27/1992	24.5	EB	872.35
7	7/29/1992	24	EB	872.31
7	7/30/1992	22	EB	872.14
7	7/31/1992	24	EB	372.31
8	8/1/1992	23	EB	872.22
8	8/3/1992	21	EB	872.06
8	8/5/1992	20	EB	871.97
8	8/6/1992	19	EB	871.89
8	8/7/1992	18.5	EB	871.85
8	8/10/1992	16	EB	871.64
8	8/11/1992	16	EB	871.64
8	8/15/1992	14	EB	871.47
8	8/17/1992	14	EB	871.47
8	8/20/1992	12.5	EB	871.35
8	8/22/1992	10	EB	871.14
8	8/29/1992	15.5	EB	871.6
9	9/1/1992	14	EB	871.47
9	9/4/1992	13	EB	871.39
9	9/7/1992	12	EB	871.31
9	9/12/1992	12	EB	871.31
9	9/14/1992	11.5	EB	871.27
9	9/22/1992	11	EB	871.22
9	9/28/1992	10	EB	871.14
10	10/1/1992	8	EB	870.97
10	10/6/1992	7	EB	870.89
10	10/7/1992	6	EB	870.81
10	10/19/1992	3.5	EB	870.6
10	10/21/1992	3	EB	870.56
10	10/28/1992	1	EB	870.39
4	4/12/1993	14	EB	871.47
4	4/15/1993	13	EB	871.39
4	4/19/1993	14	EB	871.47
4	4/22/1993	14	EB	871.47
4	4/27/1993	12	EB	871.31
5	5/1/1993	11	EB	871.22
5	5/10/1993	8	EB	870.97
5	5/26/1993	6	EB	870.81
6	6/11/1993	8	EB	870.97
6	6/28/1993	10	EB	871.14
6	6/29/1993	13	EB	871.39
6	6/30/1993	15	EB	871.56
7	7/2/1993	23	EB	872.22
7	7/3/1993	28	EB	872.64
7	7/4/1993	29	EB	872.72
7	7/5/1993	28	EB	872.64
7	7/8/1993	26	EB	872.47
7	7/10/1993	25	EB	872.39
7	7/11/1993	24	EB	872.31
7	7/12/1993	25	EB	872.39
7	7/13/1993	24.5	EB	872.35
7	7/17/1993	22	EB	872.14
7	7/19/1993	23	EB	872.22
7	7/20/1993	23	EB	872.22
7	7/21/1993	22	EB	872.14
7	7/23/1993	20.5	EB	872.02
7	7/27/1993	18	EB	871.81
7	7/31/1993	15	EB	871.56
8	8/3/1993	14	EB	871.47
8	8/5/1993	14	EB	871.47
8	8/7/1993	12	EB	871.31
8	8/8/1993	12	EB	371.31
8	8/11/1993	11	EB	871.22
8	8/13/1993	10.5	EB	871.18
8	8/14/1993	10	EB	871.14
8	8/17/1993	9	EB	871.06
8	8/23/1993	4	EB	870.64
8	8/24/1993	5	EB	870.72
9	9/1/1993	4	EB	870.64
9	9/8/1993	2	EB	870.47
9	9/22/1993	0	EB	870.31

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month Date Gage Measurement Gage Location Pool Level

Recorded Pool Levels durring non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
9	9/29/1993	0 EB		870.31
9	9/30/1993	1 EB		870.39
10	10/5/1993	0 EB		870.31
10	10/14/1993	-2 EB		870.14
10	10/19/1993	-2 EB		870.14
4	4/4/1994	-1 EB		870.22
4	4/10/1994	3 EB		870.56
4	4/11/1994	3.5 EB		870.6
4	4/12/1994	5 EB		870.72
4	4/13/1994	8 EB		870.97
4	4/18/1994	8 EB		870.97
5	5/12/1994	7 EB		870.89
5	5/18/1994	6 EB		870.81
5	5/23/1994	4 EB		870.64
5	5/27/1994	4 EB		870.64
6	6/2/1994	2 EB		870.47
6	6/9/1994	0 EB		870.31
6	6/21/1994	-1 EB		870.22
6	6/23/1994	-2 EB		870.14
6	6/27/1994	2 EB		870.47
6	6/30/1994	3 EB		870.56
7	7/1/1994	2 EB		870.47
7	7/5/1994	5 EB		870.72
7	7/6/1994	4 EB		870.64
7	7/11/1994	4 EB		870.64
7	7/20/1994	2 EB		870.47
7	7/25/1994	3 EB		870.56
7	7/26/1994	2 EB		870.47
8	8/1/1994	3.5 EB		870.6
8	8/8/1994	2 EB		870.47
8	8/17/1994	3 EB		870.56
8	8/23/1994	2 EB		870.47
8	8/30/1994	2 EB		870.47
9	9/20/1994	-2 EB		870.14
9	9/30/1994	-2 EB		870.14
10	10/11/1994	-4 EB		869.97
10	10/17/1994	-5 EB		869.89
4	4/1/1995	9 EB		871.06
4	4/10/1995	11 EB		871.22
4	4/11/1995	12 EB		871.31
4	4/17/1995	12.5 EB		871.35
4	4/21/1995	14 EB		871.47
4	4/23/1995	15 EB		871.56
5	5/1/1995	13 EB		871.39
5	5/8/1995	10 EB		871.14
5	5/22/1995	14 EB		871.47
6	6/1/1995	10 EB		871.14
6	6/5/1995	9 EB		871.06
6	6/12/1995	13 EB		871.39
6	6/15/1995	12 EB		871.31
6	6/19/1995	12 EB		871.31
6	6/19/1995	12 EB		871.31
6	6/23/1995	10 EB		871.14
7	7/3/1995	11 EB		871.22
7	7/11/1995	9.5 EB		871.1
7	7/19/1995	7 EB		870.89
7	7/31/1995	10 EB		871.14
8	8/7/1995	12 EB		871.31
8	8/8/1995	14 EB		871.47
8	8/9/1995	16 EB		871.64
8	8/10/1995	16 EB		871.64
8	8/11/1995	17 EB		871.72
8	8/14/1995	15 EB		871.56
8	8/17/1995	14 EB		871.47
8	8/21/1995	13 EB		871.39
8	8/24/1995	10 EB		871.14
8	8/31/1995	9 EB		871.06
9	9/5/1995	7 EB		870.89
9	9/11/1995	6 EB		870.81
9	9/15/1995	6 EB		870.81
9	9/25/1995	4 EB		870.64
10	10/2/1995	3 EB		870.56

Recorded Pool Levels durring non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
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Recorded Pool Levels during non managed months - pre spillway modification

Average Gage Measurement is 5.00 in.
Average Pool Level is 870.72 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
10	10/6/1995	8	EB	870.97
10	10/10/1995	8	EB	870.97
10	10/17/1995	6	EB	870.81
10	10/30/1995	5.5	EB	870.77
4	4/2/1996	7	EB	870.89
4	4/6/1996	7.5	EB	870.93
4	4/18/1996	7	EB	870.89
4	4/22/1996	7	EB	870.89
4	4/28/1996	12	EB	871.31
5	5/3/1996	16	EB	871.64
5	5/4/1996	16	EB	871.64
5	5/9/1996	19	EB	871.89
5	5/13/1996	19	EB	871.89
5	5/16/1996	17	EB	871.72
5	5/22/1996	14	EB	871.47
5	5/26/1996	14	EB	871.47
5	5/27/1996	15	EB	871.56
5	5/28/1996	14	EB	871.47
5	5/31/1996	14	EB	871.47
6	6/4/1996	12	EB	871.31
6	6/9/1996	14	EB	871.47
6	6/10/1996	15	EB	871.56
6	6/17/1996	14	EB	871.47
6	6/20/1996	12	EB	871.31
6	6/24/1996	12	EB	871.31
6	6/30/1996	10	EB	871.14
7	7/8/1996	8	EB	870.97
7	7/11/1996	6	EB	870.81
7	7/15/1996	7	EB	870.89
7	7/22/1996	9.5	EB	871.1
7	7/23/1996	10	EB	871.14
7	7/31/1996	8	EB	870.97
8	8/7/1996	8	EB	870.97
8	8/12/1996	6	EB	870.81
8	8/19/1996	4	EB	870.64
9	9/3/1996	2	EB	870.47
9	9/11/1996	2	EB	870.47
9	9/18/1996	0	EB	870.31
10	10/10/1996	0	EB	870.31
10	10/16/1996	-3	EB	870.06
Average		5.00		870.72

Recorded Pool Levels during non managed months* - post spillway modification

*note that while the pool was not actively managed during this period, data from the previously managed months was removed in order to compare similar times of the year

Average Gage Measurement is 7.42 in.
Average Pool Level is 870.96 NGVD

Month	Date	Gage Measurement	Gage Location	Pool Level
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Analysis of Rainfall Data from Celina Gage

Sum of Light Rainfall Days YEAR	Total
1985	122
1986	115
1987	117
1988	99
1989	111
1990	90
1991	110
1992	111
1993	114
1994	93
1995	98
1996	114
1998	82
1999	87
2000	97
2001	91
2002	98
2003	93
2005	95
2006	106
2007	83

Sum of Medium Rainfall Days YEAR	Total
1985	22
1986	18
1987	13
1988	14
1989	21
1990	24
1991	11
1992	16
1993	17
1994	17
1995	17
1996	22
1998	15
1999	16
2000	18
2001	22
2002	12
2003	24
2005	11
2006	17
2007	21

Sum of Severe Rainfall Days YEAR	Total
1985	3
1986	11
1987	5
1988	5
1989	10
1990	13
1991	9
1992	11
1993	5
1994	3
1995	8
1996	5
1998	10
1999	3
2000	6
2001	10
2002	7
2003	16
2005	13
2006	9
2007	9

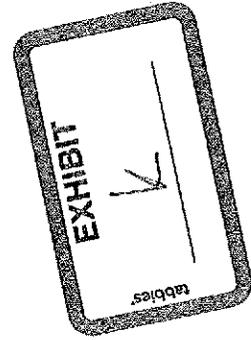
Sum of TOTAL (IN) YEAR	Total
1985	35.12
1986	39.84
1987	32.39
1988	29.29
1989	43.16
1990	51.12
1991	34.71
1992	47.68
1993	37.77
1994	30.39
1995	37.18
1996	39.17
1998	37.71
1999	29.55
2000	36.5
2001	39.48
2002	33.35
2003	60.33
2005	38.93
2006	45.62
2007	39.96

Average Annual Precipitation (in), 1985-1996 38.15
 Average Annual Precipitation (in), 1998-2007* 40.16 5.3%
 Average Number of Light Rainfall Days, 1985-1996 108
 Average Number of Light Rainfall Days, 1998-2007* 92 -14.3%
 Average Number of Medium Rainfall Days, 1985-1996 18
 Average Number of Medium Rainfall Days, 1998-2007* 17 -1.9%
 Average Number of Severe Rainfall Days, 1985-1996 7
 Average Number of Severe Rainfall Days, 1998-2007* 9 25.8%

*(2004 excluded since gage data incomplete)

Light Rainfall Day is 0.01 - 0.49 inch precipitation in 24 hours
 Medium Rainfall Day is 0.50 - 0.99 inch precipitation in 24 hours
 Severe Rainfall Day is >= 1.00 inch precipitation in 24 hours

Source: Gage data from National Climatic Data Center (NCDC), Daily Surface Data for Celina 3 NE, Ohio Gage (Cooperative Station Number 33-1390)



Attachment not scanned