

1 IN THE MATTER OF:
2 FREE FLOW POWER PROJECT

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NO. 12829-001

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18 2:00 p.m. FERC scoping meeting taken at the
19 Holiday Inn Select, 811 North 9th Street, in the City
20 of St. Louis, State of Missouri, on the 7th day of
21 May, 2009 before Catherine L. Turner, Certified
22 Shorthand Reporter.

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1 APPEARANCES :

2

3 REPRESENTATIVES FOR FERC :

4 SARAH L. FLORENTINO

5 ANNIE JONES

6 ALLAN E. CREAMER

7 REPRESENTATIVES FOR FREE FLOW POWER :

8 RAMYA SWAMINATHAN

9 CHRIS WILLIAMS

10 JON GUIDROZ

11 SPEAKERS :

12 JOE COUSIN

13 NORM WHITLOCK

14 CHUCK FRERKER

15 DAN KING

16 LISA MARESCHAL

17 ED HENLEBEN

18 JACK NORMAN

19 TIM ALBERS

20 MARK WUNSCH

21 JANE LEDWIN

22 MATT MANGAN

23 FRANK JOHNSON

24 RAY GAWLICK

25 KIM ERNDT

1 MS. SARAH FLORENTINO: Welcome everyone.
2 Thank you all for joining us. This is the ninth of
3 ten public scoping meetings for Free Flow Power's
4 proposed lead hydrokinetic projects on the Mississippi
5 River.

6 This meeting is hosted by the Federal Energy
7 Regulatory Commission or the FERC, otherwise known as
8 FERC or the Commission. The Commission is an
9 independent federal agency which regulates non-federal
10 hydropower projects among other responsibilities.

11 It is currently composed of three
12 commissioners and one chairman. Ultimately the
13 Commission decides whether or not to or under what
14 conditions to issue licenses for proposed hydropower
15 projects.

16 My name is Sarah Florentino. I'm an
17 environmental biologist with the Commission. And I'm
18 also a coordinator for the licensing process of the
19 lead Mississippi River projects. Thank you all for
20 joining us today. We hope to make this a productive
21 meeting of information sharing.

22 In a nutshell, during this meeting we will
23 be providing you all with information about the
24 Commission's licensing process and about the proposed
25 lead projects. We are also requesting comments and

1 information pertinent to the proposed lead projects
2 from interested stakeholders such as yourselves.

3 We would like to emphasize this is the
4 beginning of the Commission's review process and there
5 will be additional opportunities for you all to
6 comment and participate. If you haven't already
7 signed in, please do so now.

8 On the sign-in sheets, please print your
9 name and address and indicate whether you would like
10 to be added to the Commission's mailing list for the
11 Free Flow Power proposed lead projects. Also at the
12 bottom of the sign-in sheet, please indicate whether
13 you'd like to speak during today's comment period.

14 We have collected all the sign-in sheets as
15 of now, but you can change your mind if you decide
16 you'd like to speak. We only have one person signed
17 up to speak so far, so we'll have plenty of time.
18 Also, if you've prepared a written statement and
19 brought it with you today, you can submit it to the
20 court reporter who is sitting up here to my left.

21 Or, if you don't have it ready and would
22 like to file it with the Commission later, you can
23 mail it or e-file it and we'll explain how to do that
24 in a few minutes. I hope you all have taken advantage
25 of our handouts that were at the table before you

1 walked in including our scoping document or SD1 for
2 short. It's packed with information about the
3 Commission's process and some general information
4 about the lead projects, so please do read it.

5 Also, we had a copy of our second scoping
6 notice which lists the schedule of all the scoping
7 meetings that we've had and are having now -- there's
8 one more left this evening here at seven p.m. -- and
9 the site visits that we have also done.

10 There's also a booklet with the Commission's
11 integrated licensing process or ILP regulations on one
12 side. And then if you flip it over, it's a lay
13 person's guide to the integrated licensing process on
14 the other side.

15 Finally, we have a brochure that is our
16 e-library brochure. It explains to stakeholders how
17 to use e-library or e-subscribe to receive e-mail
18 notifications on all the filings for this project of
19 these proposals and also how to file comments
20 electronically with the Commission.

21 I'd like to point out on the back of the
22 brochure, we have listed the project numbers at the
23 bottom half of the page where it says your docket
24 numbers.

25 Okay. So we hope to present our slides as

1 efficiently as possible so we'll allow plenty of time
2 for questions and comments at the end of the
3 presentation. And in that regard, let me show you our
4 agenda.

5 First we will do introductions, at least of
6 the FERC staff and contractor staff that are here
7 today. Following introductions we will discuss the
8 overall proposal and lead project concept. The
9 purpose of scoping, working with the U.S. Army Corps
10 of Engineers, our anticipated schedule for preparation
11 of the environmental impact statement or EIS, and then
12 how you can help us gather information that we need
13 for a thorough analysis of the proposals.

14 After covering those topics, we will allow
15 representatives from Free Flow Power to provide a
16 brief project description of the seven lead projects.
17 Finally, we will provide our preliminary scope for the
18 cumulative effects analysis and EIS in the procedures
19 for spoken and written comments.

20 So for introductions, I am Sarah Florentino.
21 I have also got with me here Allan Creamer. He's our
22 technical expert assigned to this project and Annie
23 Jones who is with our office of general counsel.
24 Additionally we have Fred Winchell who is at the very
25 back of the room. He's our contractor project

1 coordinator.

2 Okay. So ultimately Free Flow Power
3 proposes to install 180,000 turbine generators across
4 55 sites to produce 1800 megawatts of average
5 operating generation with a total installed capacity
6 of 7200 megawatts.

7 Free Flow Power proposes that seven of the
8 55 sites be treated as lead projects, and that the
9 licensing process be initiated for those sites using
10 the Commission's integrated licensing process or the
11 ILP.

12 The lead hydrokinetic projects include the
13 proposed Greenville Bend, Scotlandville Bend, Kempe
14 Bend, Ashley Point, Hope Field Point, Flora Creek
15 Light and McKinley Crossing projects. Descriptions of the
16 lead projects are provided in Section 3 of the scoping
17 document as well as Free Flow Power's pre-application
18 document or PAD as we call it for short.

19 After the seven lead projects have completed
20 the study determination phase of the ILP, Free Flow
21 Power plans to prepare licensing applications for the
22 other 48 sites under the Commission's traditional
23 licensing process or TLP.

24 Free Flow Power intends for the study plans
25 established during the ILP to be used at the TLP

1 sites. We are currently focusing only on seven lead
2 projects. Scoping needs for the 48 TLP sites will be
3 held at later dates.

4 Okay. So what is the purpose of scoping?
5 The National Environmental Policy Act or NEPA, FERC's
6 regulations and other applicable laws require
7 evaluation of environmental effects of licensing or
8 re-licensing of hydropower projects.

9 FERC staff will analyze the effects of
10 proposed projects on aquatic, terrestrial,
11 recreational, cultural, tribal, aesthetic and
12 developmental resources. The scoping process is a
13 part of NEPA and used to identify issues and concerns
14 to be addressed in NEPA documents such as
15 environmental assessment and environmental impact
16 statements or EIS.

17 During scoping meetings, FERC staff
18 solicit input from federal, state and local
19 agencies, Indian tribes, non-governmental
20 organizations and the public. The Scoping Document 1,
21 again SD1, for the lead projects was issued on March
22 16th, 2009. It provides a preliminary list of issues
23 the Commission staff plan to analyze and the EIS for
24 the lead projects. And if you'd like to flip to that
25 page of the scoping document, it starts on page 17.

1 As you may be aware, the Army Corps of
2 Engineers is involved in virtually everything that
3 goes on on the Mississippi River. We anticipate that
4 the Corps will actively participate in the
5 Commission's licensing process for the seven lead
6 projects. At this time, I'd like to read a brief
7 statement prepared by the Corps of Engineers.

8 The U.S. Army Corps of Engineers supports
9 the development of renewable energy projects where
10 these projects are feasible and in case of
11 hydrokinetics projects on the Mississippi River where
12 these projects are compatible with Corps mission of
13 navigation, flood risk management and environmental
14 stewardship and recreation.

15 The Mississippi River -- the Mississippi
16 Valley Division has provided comments to the Federal
17 Energy Regulatory Commission and Free Flow Power
18 Corporation regarding the hydrokinetics projects being
19 planned on the Mississippi River. The Corps of
20 Engineers will continue to work with FERC and Free
21 Flow Power through FERC's licensing process and the
22 Corps's regulatory processes to ensure that these
23 projects are compatible with the Corps mission on the
24 Mississippi River.

25 Now to cover a couple items on the

1 environmental impact statement preparation schedule.
2 I'd like to point out the Commission has recently
3 approved the request of the Fish and Wildlife Service
4 and the Environmental Protection Agency to extend the time
5 for stakeholders such as yourselves to provide
6 comments on Free Flow Power pre-application documents,
7 comments on Commission's scoping documents and also to
8 submit your study requests for the seven lead project
9 proposals.

10 The previous due date was May 15th, but it
11 has been extended 60 days to July 14th, 2009. This
12 time extension will affect the rest of the schedule,
13 so I would like to make sure everyone knows to keep an
14 eye out for the updated schedule which will be issued
15 in our Scoping Document 2 or SD2 for short.

16 And the updated schedule will look much like
17 the schedule in Appendix B of Scoping Document 1. It
18 will have the list of the steps of the process, the
19 stakeholders or parties, I should say, responsible for
20 each step and the new due dates.

21 You can help us gather pertinent information
22 with the Commission's analysis of the proposed lead
23 projects. Please inform us of any significant
24 environmental issues that should be addressed in our
25 EIS.

1 Please provide us with a study request for
2 any information needed for a thorough analysis of the
3 lead project proposals. We encourage everyone who
4 plans to request studies to write clear and detailed
5 study requests following the Commission's seven study
6 plan criteria as listed in Appendix A of the scoping
7 documents.

8 Please submit any information or data
9 describing past and present conditions of the project
10 areas. In addition, please submit any resource plans
11 and future proposals in the project areas.

12 You may provide us with your comments and
13 the study requests in several ways. Oral or written
14 comments can be provided today. You may also file
15 comments electronically or you can mail your comments
16 to the FERC secretary. Her name is Kimberly D. Bose
17 and the address is listed on the slide, but also on
18 page iii and page 24 of the scoping documents.

19 Again, please note that the comments on the
20 applicant's pre-application documents, the
21 Commission's scoping documents and all study requests
22 are due by July 14th of this year.

23 At this time, we would like to allow
24 representatives from Free Flow Power to provide us
25 with brief descriptions of the lead projects.

1 MS. RAMYA SWAMINATHAN: Good afternoon and
2 thank you for coming out. I'm Ramya Swaminathan from
3 Free Flow Power, and I wanted to take a minute to
4 introduce my colleagues as well. Chris Williams, our
5 chief technology officer, and Jon Guidroz who works
6 with me in project development, we're all sitting up
7 here and we'll be happy to chat with you guys and
8 answer questions after the meeting is over as well to
9 the extent anybody has any questions to ask.

10 I won't spend long on this page. I think
11 Sarah covered most of it. But just to reiterate a few
12 brief points, we have 55 proposed projects on the
13 Mississippi River. They extend from New Orleans,
14 Louisiana all the way up here to the St. Louis area.

15 Each project site ranges between 2 and 16
16 river miles and they are located in seven states. The
17 preliminary permits from the Federal Energy Regulatory
18 Commission were issued in early 2008. And in early
19 2009, January to be specific, we filed with the
20 Commission our pre-application document and notice of
21 intent which kicked off this process and here we are
22 today.

23 We wanted to note that we believe that
24 hydrokinetics is a compelling alternative in this
25 region of the country extending all the way down to

1 the Gulf, and simply for reasons of natural geographic
2 endowment. This corridor is not well endowed with
3 other sources of renewable energy which other parts of
4 the country create a much more compelling -- which
5 form a much more compelling case.

6 But what this region does have, obviously,
7 is the Mississippi River, the third largest river
8 system in the world exceeded only by the Congo and the
9 Amazon. Absolutely tops in terms of flow and volume,
10 major source of renewable energy.

11 Wanted to spend a minute on the turbine
12 generator we have developed. The right-hand side of
13 this slide shows you photographs of a one-meter
14 prototype device that has been tested in a tank in
15 Massachusetts. It generates ten kilowatts of output
16 and flows at three meters per second.

17 The left-hand side of the page shows you
18 renderings of the three-meter second generation device
19 which generates ten kilowatts of output and flows at
20 two and a quarter meters a second. And that unit is
21 currently in fabrication expected to be ready by this
22 summer.

23 The middle part of the page shows you an
24 exploded view of that second generation device. I'm
25 going to skip the verbiage on the middle part of the

1 page. It's mostly covered on the next page.

2 Some of the key design features of this
3 device that we wanted to tell you about, it has a low
4 tip speed ratio of about two to one mitigating fish
5 injury from mechanical strike.

6 The device is powered by the ambient flow of
7 the river, and therefore there's a de minimis pressure
8 gradient so the turbine does not accelerate the flow
9 of water and there are no high-velocity effusions that
10 can cause turbulent shear stress, no small gaps that
11 would cause grinding injury.

12 They would be deployed below the navigation
13 channel off the river bed with relatively minimal
14 onshore equipment largely consisting of cabling that
15 would run from groups of turbines onto shore and then
16 a small shore substation. No chemical lubricants that
17 could leach into the river. The bearings used are
18 hydrodynamic which are lubricated by water.

19 We are committed to a deployment strategy
20 that is flexible. Some of the configurations you see
21 on this page are more applicable to the deep draft or
22 down river from here the deep draft parts of the
23 river. But the basic idea is that the turbines would
24 be affixed to pilings driven into the river bed.
25 Where there is required depth, the turbines could be

1 stacked vertically as you see on the right-hand side
2 of this graphic.

3 In this area of the river, it's very likely
4 that we would be deploying much more like the bottom
5 center part of it where you would have pilings and
6 rows of turbines suspended between them in either one
7 or two arrays stacked vertically or even one to
8 account for the depth in this part of the river.

9 The installation and maintenance of the
10 system is intended to be modular and swift. The idea
11 is that they would be serviced from the surface of the
12 river with a barge and crane type operation where a
13 sleeve of arrays would be lifted off the piling driven
14 into the river bed, lifted onto the barge for
15 servicing any defective turbines to be replaced, a
16 sleeve to be lifted back onto the piling and the barge
17 making the next stop on the way.

18 I think this graphic might be difficult to
19 see, but I'm hoping that all of you can see a stretch
20 of the river. There are really only two things to
21 focus on on this slide.

22 This is our Site No. 8 which is the site in
23 the New Orleans area called Greenville Bend. And in
24 the center of the page, there should be green dots.
25 This is intended to give you a sense of scale in the

1 river as deployed. And the green dots represent
2 pilings, each would have six turbines in the three and
3 three vertical arrangement that you saw earlier.

4 The two rows of pilings of turbine arrays
5 are situated 75 feet apart. And each turbine array is
6 situated 50 feet apart from the other. So that's
7 intended to give you a sense of scale.

8 The next three pages are dense. And I
9 apologize for that in advance, but I did want to get
10 the material out here. This presentation is available
11 on our web site. So to the extent you want to take a
12 look at the language here, go to our web site,
13 www.free-flow-power.com, so our company's name with
14 the three dashes in between.

15 I wanted to give you a sense of the seven
16 lead sites and what that means for the entire 55
17 proposed projects of the Mississippi River. The seven
18 lead sites were intended -- were chosen such that they
19 represented an array of broad characteristics of the
20 entire slate of 55 proposed projects.

21 They come from a variety -- each of them
22 have a variety of characteristics ranging from
23 differences in land use in the surrounding areas to
24 cultural resources to aquatic species, habitat
25 complexity, etcetera of different interconnect

1 environments. And this slide and the next one lists
2 each of the species and gives you a description of the
3 surrounding land use and some facility notes on each
4 of the sites as well as habitat notes. And you can
5 take a look at those at your leisure.

6 And then finally we embarked on a process of
7 extensive consultation with stakeholders and research
8 to identify resource areas that were of concern. And
9 this slide really summarizes the most important
10 resource areas, navigation, water quality, aquatic,
11 terrestrial species and cultural historic sites. I
12 invite you to take a look at this on our web site and
13 catch any one of us after and we'd be happy to talk
14 through any of this. Thank you very much.

15 MS. SARAH FLORENTINO: So first off, as Ramya
16 mentioned, we also will be analyzing effects of the
17 proposed projects. A preliminary list also of the
18 potential effects can be found on pages 17 through 20
19 of the scoping document. But this slide, we're
20 looking at the scope of cumulative effects, actually.

21 As discussed on pages 16 and 17 of the
22 scoping document, Commission staff have reviewed Free
23 Flow Power's pre-application documents and identified
24 the following resources that may be cumulatively
25 affected by the proposed lead projects, water quality,

1 fishery resources, wetland and terrestrial resources,
2 commercial navigation and recreation.

3 Our geographic scope of analysis for
4 cumulative effects is generally the middle and lower
5 Mississippi River for water quality, fisheries and
6 terrestrial resources. The scope for navigation
7 extends to the limits of significant commercial
8 navigation and drainage. Our proposed scope for
9 cumulative effects analysis includes past, present and
10 foreseeable future actions 30 to 50 years into the
11 future.

12 So there are just a couple procedures I'd
13 like to cover for the remainder of the meeting. This
14 goes without saying, but please show respect to fellow
15 participants. Please speak one at a time. And we
16 won't need to have time limits, but let's please keep
17 in mind we should allow everyone who wishes a chance
18 to speak a chance to speak.

19 Before you begin speaking, please provide
20 your name, including the spelling for our court
21 reporter so we can have an accurate record of
22 comments. And again, if you would like to leave
23 written comments with the court reporter, you may do
24 that today or you may mail your written comments to
25 the Commission.

1 With that, I'm going to turn it over to
2 Allan Creamer to do a moderating for -- oh, I'm sorry.
3 I forgot to ask. That's right. I was meaning to take
4 a break to just ask if anyone has any questions about
5 the Commission's licensing process or the seven lead
6 projects before we get into the comment period.

7 MR. JOE COUSIN: What is the cost of the
8 seven lead projects? I just had a question what the
9 cost of the seven lead projects was going to be
10 estimated at. Oh, Joe Cousin, C-O-U-S-I-N.

11 MS. SARAH FLORENTINO: I don't know the
12 answer to that question.

13 MS. RAMYA SWAMINATHAN: At this point, it's
14 premature for us to say.

15 MS. SARAH FLORENTINO: Any other questions
16 about the process?

17 MR. NORM WHITLOCK: My name is Norm
18 Whitlock. I am with American Commercial Lines. I
19 guess one of the questions I have is what determines
20 or what criteria goes in to determine the particular
21 site where you propose one of these to go?

22 MR. CHRIS WILLIAMS: I'm Chris Williams, the
23 chief technology officer. There's a number of
24 criteria that go into the initial selection, the first
25 of which is to have adequate flow volume and flow

1 velocity in the sites. That's why we ended up on the
2 Mississippi River rather than other small rivers
3 throughout the country.

4 We selected the river on the basic type
5 selection criteria having to do with choosing sites
6 that have higher flow velocity and also close to the
7 shore base infrastructure would be potential
8 customers. I think industrial sites or municipalities
9 who would be able to buy the electricity locally
10 rather than going to the wholesaler electric
11 transmission. Does that answer your question, sir?

12 MR. NORM WHITLOCK: I had one more question.
13 Do these particular sites, do they come under the
14 permitting requirements that the Corps of Engineer has
15 under Section 10 of the River and Harbors Act of 1899?

16 MR. CHRIS WILLIAMS: Yes.

17 MS. SARAH FLORENTINO: Yes, they do.

18 MR. CHUCK FRERKER: Chuck Frerker, Corps of
19 Engineers. I work in Regulatory Branch Section 44.
20 That's something we're working out with FERC right now
21 to be hopefully a cooperating agency but advocates the
22 applicable permits. The Corps reviews the plan in
23 this case too.

24 MR. DAN KING: My name is Dan King. I'm
25 with the Electrical Workers, Local 1 in St. Louis

1 here. I wonder, are these projects strictly private
2 or is there public money involved or would there be?

3 MS. RAMYA SWAMINATHAN: At this point, we're
4 funded entirely privately.

5 MS. SARAH FLORENTINO: Any other questions
6 either about the lead project proposals or the
7 Commission's licensing process? Don't be shy. We
8 won't bite. You can ask questions afterwards too if
9 something occurs to you later.

10 MS. LISA MARESCHAL: Lisa Mareschal, Ingram
11 Barge Company. I'm just curious. You mentioned about
12 you tried to set the site near public areas where
13 there might be businesses that benefit from your
14 electricity. So who would end up selling that
15 electricity to them? Would it be your company? Or
16 who benefits from this, basically?

17 MS. RAMYA SWAMINATHAN: I'll sort of divide
18 the question into two. The question of who benefits
19 as a renewable source of energy, we actually think
20 there are wider community benefits that obtain from a
21 whole new carbon footprint. Benefits to the local
22 community in terms of increased jobs particularly in
23 this region of the country as well as increased
24 electricity supply as well.

25 And I'm not certain that was the crux of

1 your question. When you say benefit that's what
2 occurs to me.

3 MS. LISA MARESCHAL: I guess what I'm
4 getting at is if you say put these in the middle of
5 the river and provide electricity to these people,
6 who's actually getting the revenue from that? Is it
7 your company getting revenue?

8 MS. RAMYA SWAMINATHAN: The sales of the
9 electricity?

10 MS. LISA MARESCHAL: Right.

11 MS. RAMYA SWAMINATHAN: It is our intent to
12 sell the electricity.

13 MS. LISA MARESCHAL: Okay. So if our
14 company, say, like our company who owns property along
15 the river would choose to allow you to put these
16 turbines in one of our locations, is there some kind
17 of payback to us for having it located on our
18 property?

19 MS. RAMYA SWAMINATHAN: That's an excellent
20 question.

21 MS. LISA MARESCHAL: Could we get the
22 electricity, say, or --

23 MS. RAMYA SWAMINATHAN: That's an excellent
24 question and we are very interested in talking to
25 abutting land owners up and down river. And we are in

1 the process -- the permits we have now don't permit us
2 to do anything, so to speak. We need to get a license
3 in order to start construction and evolve the project.
4 But the short answer is we are very interested in
5 discussing what would be beneficial to both parties.

6 MR. DAN KING: Dan King again. Do you have
7 a time line on when these lead projects would start
8 and would this work be done by Free Flow or would that
9 be subcontracted out?

10 MS. RAMYA SWAMINATHAN: As I mentioned in my
11 answer to this lady here, the permits that we have now
12 don't permit construction. And we anticipate filing
13 license applications at the end of 2010, and so from
14 the time we file our license applications, it's really
15 the jurisdiction of the FERC as to when the licenses
16 and the Corps and the other permits we need to get.

17 So I think it's fair to say that we don't
18 anticipate construction certainly not through 2010,
19 probably not for a while afterwards either. And I
20 think again, our plans as to how the work is going to
21 be performed has not been fully fleshed out. We are
22 early in the process. But we are open to suggestions
23 and relationships that will be fully fleshed out as we
24 move forward and our plans get more developed.

25 MR. ALLAN CREAMER: My name is Allan

1 Creamer. I'm with FERC. The slide we have up here,
2 Sarah talked about this earlier, about EIS being our
3 target now is October 2011. And after that is when
4 the Commission -- the record would be complete and
5 ready for Commission action. So at a minimum, we're
6 probably looking at the end of 2011 or beginning of
7 2012 before licenses would be issued and they would
8 begin.

9 MS. SARAH FLORENTINO: Actually, just
10 looking at our scoping document schedule, we have a
11 very detailed schedule. We're not scheduled to have a
12 license order, if that were to occur, until the fall
13 of 2012. No sooner than that. This schedule is based
14 on the previous --

15 MR. ED HENLEBEN: My name is Ed Henleben.
16 I'm with the River Industry Action Committee which is
17 a towing industry committee that oversees safe
18 navigation. I'm wondering what group or committees
19 are you working with when you make these
20 determinations that your projects are out of a
21 navigable channel? I'm looking at one of your charts
22 and I see, to me, it looks like that's right in the
23 middle of the channel. I'm wondering what agency or
24 group are you working with to make that decision.

25 MS. RAMYA SWAMINATHAN: I think probably the

1 statement you are referring to is a statement that we
2 will not have -- we will not adversely affect
3 navigation. We'll not impair navigation. Not that we
4 will not be in the navigation channel.

5 And the work that we are doing currently is
6 in consultation with the Army Corps of Engineers and
7 each of the districts up and down the river as well as
8 the Coast Guard. But we also welcome conversation
9 with folks like yourselves who are users of the river,
10 so let's make sure we connect.

11 MS. SARAH FLORENTINO: Any other questions?

12 MR. JACK NORMAN: Simple one, I hope. My
13 name is Jack Norman. Is there a way between now and
14 three hours from now to get a copy of the
15 pre-application document?

16 MS. SARAH FLORENTINO: The pre-application
17 document is available on the Commission's e-library.
18 I can show you how to --

19 MR. JACK NORMAN: Not now.

20 MS. SARAH FLORENTINO: You don't have access
21 to the internet?

22 MR. JACK NORMAN: They're down.

23 MS. RAMYA SWAMINATHAN: The pre-application
24 document notice and the notice of intent are both
25 available on our web site as well,

1 www.free-flow-power.com. Click on the news section.

2 MR. JON GUIDROZ: It's under in the news
3 section about the fifth article down. It says, Free
4 Flow Power submits pre-application document.

5 MS. SARAH FLORENTINO: I saw another
6 question over here.

7 MS. LISA MARESCHAL: I actually have two
8 additional questions. Of the studies you have done
9 thus far, what have you found as far as what the
10 impact would be on navigation or commercial
11 navigation, recreational navigation on the river? How
12 is this going to impact?

13 And the other kind of tied into that, have
14 your studies taken into consideration what happens
15 when the river rises significantly or falls
16 significantly? Because if you have got these things
17 down below the water line and the river drops way
18 down, are they going to be in the way?

19 MS. RAMYA SWAMINATHAN: The concern is that
20 we be absolutely below the navigation channel
21 irrespective of river stage, meaning we can't be below
22 the navigation channel when the water is high and then
23 somehow be in the navigation channel when the water is
24 low.

25 I think your concern is exactly on point.

1 We need to always -- it's an absolute requirement we
2 never impair navigation, and we understand that.
3 We've been working with the Corps to understand the
4 implications of that requirement.

5 I think with respect to the licensing
6 process, we're at a point now and I will defer to
7 Chris to explain it more thoroughly, but we are at the
8 beginning of the process that will ultimately
9 determine the studies that we need to perform.

10 That's what this meeting is about. We've
11 done a lot of research. We have done a lot of work,
12 but I think this process is about determining what
13 studies will be done through the rest of the scoping
14 process. As I said, I will defer to Chris to say it
15 in the right way.

16 MS. SARAH FLORENTINO: That's correct. In
17 order to prepare the pre-application document, the
18 applicant is to gather all existing data about the
19 resources of the potential impacts. They're not
20 required to actually do any studies on the proposed
21 action and how that affects the resources.

22 That is what we're going to be doing in the
23 next few steps of the licensing process. And if you
24 look at your Appendix B in the scoping document, it
25 sort of goes through what the next steps will be. The

1 dates will change, but you'll see that there's several
2 opportunities for stakeholders such as yourselves to
3 participate in the development of those studies and
4 make sure that we cover all the bases in terms of
5 finding out what the potential effects to resources
6 might be.

7 We will determine which studies will be done
8 in the end, but all of you are welcome to submit study
9 requests that you think are important to determine the
10 effects of the proposals.

11 MS. LISA MARESCHAL: And who ultimately does
12 the study?

13 MS. SARAH FLORENTINO: Free Flow Power will
14 do the studies. But I should say also part of the
15 scoping process is to accumulate information from all
16 sources. If you are aware of journal articles or
17 other studies that are not in our record as of yet,
18 please submit those to the Commission. That will help
19 us do a thorough analysis of the potential effects.
20 We have another question.

21 MR. TIM ALBERS: Tim Albers. Does Free Flow
22 Power currently utilize electricity from the turbines
23 and do they know that the technology works?

24 MR. CHRIS WILLIAMS: We are in an ongoing
25 development process. We do not have any devices in

1 store to supply energy to customers. That's something
2 that actually requires a federal permit for even a
3 pilot process.

4 But we expect over the period of time that
5 it will take to develop the analyses and to acquire
6 the licenses to start construction that we will have
7 completed a series of field trials and implement
8 improvements to the devices we've already built such
9 that by the time we start to deploy on a commercial
10 scale, we'll have a device that meets both technical
11 needs of the energy generation and other needs such as
12 environmental consideration that come out with the
13 study process.

14 Yes. We also have built a prototype device
15 and tested how actually it behaves in a test tank,
16 simulated river environment and measured the
17 generating capacity. So we know that the
18 configuration of our device works correctly, and we're
19 in the process now of building larger devices where
20 the design changes that we have made in that design
21 iteration are from consultations with environmental
22 people about environmental concerns, about fishing and
23 things like that. But we expect our process to
24 continue to improve over the years.

25 MR. MARK WUNSCH: Mark Wunsch with the Army

1 Corps of Engineers, W-U-N-S-C-H. Just two things have
2 been curious to me. We obviously deal with siltation
3 in the river bed and having to dredge for that.

4 These turbines being installed at the base
5 of the river, I'm wondering how you're going to deal
6 with that. Today you mentioned pulling the pilings.
7 Maybe that's how you would deal with something that
8 you are installing, pulling them to do repairs. You
9 guys can answer the question.

10 My second one is the fish mortality. Are
11 the turbines -- you said that they are low tips to
12 eliminate the fish injury. Can you elaborate on that?

13 MR. CHRIS WILLIAMS: To answer the first
14 part of your question about silt imbedded in the
15 river, to say the turbines are placed at the bottom of
16 the river is a little bit of an oversimplification.

17 The turbines will be placed below the
18 navigation channel and above the high bed silt area,
19 sanguine and some of the major changes in the
20 configuration. That does mean there are some
21 locations in the river where there's no distance
22 between the navigation channel. There's enough
23 available area between the navigation channel and the
24 top and the bed below on the bottom of the river.

25 MR. MARK WUNSCH: So you don't deal with

1 that issue. I misunderstood.

2 MS. RAMYA SWAMINATHAN: The pilings will be
3 driven into the river bed.

4 MR. CHRIS WILLIAMS: The second part of the
5 question was about fish impact. The device, low tip
6 speed ratio means -- a tip speed ratio two to one
7 means the rotation -- the edge speed of the turbine
8 blade is no more than twice that of the water flowing
9 through it.

10 We've extensively studied the existing
11 studies that we've done for fish turbines for
12 traditional hydroelectric plants where they hooked up
13 both by field studies and by tank studies and
14 determined the relationship between mortality for
15 various species and various types of insults to the
16 fish that have been struck by a moving turbine blade
17 or caught between the stationary and moving parts.

18 I would like to address both of those
19 issues. One, by having a low rotation speed so the
20 strike injury chance of a fish swimming through
21 between the turbine blades is the speed of the turbine
22 blade is well below any documented speed for
23 mortality.

24 The other is where it separates the struts
25 that hold the central area device from moving parts of

1 more than one meter, so the chance of fish being
2 caught between stationary and moving parts is also
3 very minimus. There's also further ongoing studies of
4 fish mortality.

5 MR. MARK WUNSCH: Thank you.

6 MS. JANE LEDWIN: Jane Ledwin, United Fish
7 and Wildlife Service. Could you tell me, does --
8 understanding this is all very new technology, I
9 appreciate Free Flow's coming out and helping us learn
10 about this.

11 How many units does FERC anticipate being up
12 and running before they need to make a decision upon
13 the licenses for these lead projects, so they have
14 something they can use to help shape their decision on
15 the license? Is that a 30-year license? Is that what
16 it says in the scoping document.

17 MS. SARAH FLORENTINO: I don't know that it
18 specifies 30 years or 50 years. I'll have to double
19 check that. Allan, do you want to take a crack at
20 that one? I think that's something we would be
21 determining with the help of the stakeholders what all
22 the tests and studies are that accurately help us
23 define potential effects to resources.

24 MR. ALLAN CREAMER: Allan Creamer with FERC.
25 At this point in time, we have a preliminary permit.

1 That doesn't allow them to do anything but to study.
2 And that's kind of what we're here now for, to do the
3 scoping and try to find out what the issues are, to
4 establish a study plan that they'll implement over the
5 next year or so.

6 So at least until -- at least for now, they
7 won't be putting anything in the water to do anything
8 before a NEPA review. Until they get a license, they
9 can't put anything in the water.

10 Now, I do believe -- and I will let them
11 speak to this a little bit more. I do believe they
12 are proceeding with, like, a demonstration project,
13 put something in just to test and see how it worked.
14 But I will let them talk to that a little bit more.

15 MS. RAMYA SWAMINATHAN: We do intend to
16 install a demonstration deployment. Right now the
17 site we are considering in the deep part of the river
18 in Baton Rouge at a particular industrial facility.
19 It will, in all likelihood -- it's not done yet.

20 In all likelihood, it would be a single
21 turbine affixed to a stationary mount, floating
22 stationary mount, so it would be suspended from the
23 surface which is a little bit different than some of
24 the designs we talked about. Obviously a much smaller
25 scale.

1 MR. ALLAN CREAMER: Does that answer your
2 question?

3 MS. JANE LEDWIN: Yeah.

4 MR. JOE COUSIN: Yes. Joe Cousin again. My
5 question is right now Free Flow is a private company.
6 And if and when this all takes off, would you then be
7 classified as a public utility like Ameren UE and
8 follow those guidelines?

9 MS. RAMYA SWAMINATHAN: At this point,
10 again, it's a little early in the process. But at
11 this point, it's not our intention to become
12 regulated.

13 MS. LISA MARESCHAL: I got a quick question.
14 When they were talking about the fish, it got me to
15 thinking about this. If you have got all these
16 turbines under the water -- and this is both from a
17 human perspective and from the wildlife -- what is the
18 level of noise from these and how is that going to
19 affect the surrounding areas of the wildlife that's in
20 the area?

21 MR. CHRIS WILLIAMS: There's two ways I can
22 think to talk about noise, one of which is what we
23 normally think about as noise which is things we can
24 hear. The other is low frequency transmission of
25 sound under water like these rotating blades.

1 The amount of energy emitted by these
2 devices would be far far less by millions of magnitude
3 than a propeller by, say, a push boat pulling barges
4 up the river.

5 Acoustic pollution or content added to the
6 river, will probably be undetectable against the
7 background, the background of the intense surrounding
8 of the traffic on the river.

9 MS. LISA MARESCHAL: Even if quite a few of
10 them are clustered?

11 MR. CHRIS WILLIAMS: Yes. Remember. This
12 is a renewable energy source. And like most of you
13 have an energy source, the energy density is very low.
14 That's why you have to have long sites and spread out
15 a good distance between. Wind, fog, solar collection,
16 you need a large area to collect the relatively small
17 amount of energy in each location.

18 So we don't concentrate sources of noise in
19 that sense, so each device would make the sound
20 extremely low frequency. The devices move very
21 slowly, less than one revolution per second. So
22 they're not going to be like, say, a fan you might
23 have in your house where you hear it whirring or
24 something like that. The acoustic spectrum of it will
25 be a very very low.

1 Now, on the shore, the only equipment that
2 we will have will be small substations much like sort
3 what you see in residential or industrial
4 neighborhoods where you often see a fence with a high
5 voltage sign and gray pieces of equipment with wire
6 sticking out. Those typically have a very small
7 acoustic footprint. But outside the site, they have
8 very low frequency.

9 MR. MATT MANGAN: Matt Mangan with Fish and
10 Wildlife Service. Just to go back to her question, if
11 you had a thousand turbines in a stretch, could they
12 amplify the sound of multiple turbines and increase
13 above a background level where you have those turbines
14 interacting?

15 And then also over time, I would assume the
16 equipment might degrade somewhat, and then there could
17 be the potential for your noise level to increase
18 based against any test you may have done already. And
19 will that -- is that in your thought process that that
20 will, I guess, become a cumulative impact over time?

21 MR. CHRIS WILLIAMS: Without getting over
22 technical, I'm happy to dig deeper in it with you
23 later. The devices are not synchronized in the sense
24 that they all turn together. Each device operates
25 independently. So we don't expect to have any sort of

1 resonance by amplification effects beyond the
2 individual contribution of each device.

3 Speaking to the change in their behavior as
4 they wear or perhaps become damaged, we would have
5 active monitoring systems built into the devices for
6 our own purposes to show an efficient energy
7 generation which will also allow us to detect devices
8 that have been damaged.

9 Once again, since the initial amount of
10 acoustic energy emitted by the devices is expected to
11 be very small, we don't want that to -- it might
12 change in nature, but it's not increased very much.
13 These devices are not moving very fast, nor are they
14 extracting that much energy.

15 MR. FRANK JOHNSON: Frank Johnson,
16 J-O-H-N-S-O-N. You are speaking about damage and
17 repair in a site. How many units would have to be
18 damaged, say, by drift, etcetera, before you would
19 have to go back on site and make a repair?

20 MR. CHRIS WILLIAMS: The financial models we
21 have developed for the purpose of financing
22 construction of these projects, we expect at any given
23 time 90 percent of the sites will be operational. Ten
24 percent of the units will be completely down and
25 others will be in some varying states of efficiency.

1 MS. SARAH FLORENTINO: Any other questions?

2 MR. NORM WHITLOCK: Norm Whitlock. I really
3 don't have a prepared statement, but I've got a lot of
4 issues and concerns that need to be looked at
5 before -- my interest is navigation, so I'm interested
6 in determining -- and I don't have enough information,
7 hadn't been presented, to determine what the potential
8 impact is.

9 But when I read some of the literature that
10 I pulled off of your all's web, you need to be careful
11 in some of the statements that are there. Like you
12 say, a navigable channel.

13 Well, the Mississippi River is really an
14 11-foot channel. And you talk about a 300-foot wide
15 channel. That's only in those cuts where the Corps
16 has to dredge and maintain a channel or 400 foot.
17 That's only in those areas.

18 Generally in those tight navigation areas
19 that are 300 to 400 foot wide, traffic doesn't pass,
20 so they hold off for southbound boats to clear those
21 areas and they pass in those stretches that are wider.

22 So it gets to the point when you talk about
23 where you may position these outside the channel, you
24 got to really understand what is the channel. Because
25 in many cases on the river, the effective width of the

1 tow going down river may be 1200 feet wide if it's in
2 a particular flanking move or what have you going
3 around the bend.

4 So you really need to get some expertise
5 from the industry when it comes time to evaluate
6 whether these sites are adequate or whether they're
7 going to seriously harm navigation.

8 A couple of the other issues that concern me
9 is the operation and maintenance of those or just the
10 maintenance of those facilities. How much
11 interruption should the industry expect? And all the
12 navigation projects that are constructed on the river
13 are based on savings of navigation.

14 The economic benefits to those projects is
15 based on the reduced delay time and constant cost and
16 would then flow to the shipper. So are we going to be
17 impacted? And if so, do we send the bill to Free Flow
18 for those kind of impacts?

19 Some of the other literature I saw talked
20 about using barge fleets and hanging things off of
21 fleeted barges. And I may have just misinterpreted
22 what the message was, but is that -- some of the
23 things that are being considered as possibly hanging
24 these off the barges that may be in barge fleets is an
25 issue.

1 And when we talk about river level, I think
2 this is something the Corps really has to look at in
3 terms of what low reference point are you really
4 speaking of? Are you talking about a
5 once-in-a-hundred-year event or are you talking about
6 a once-in-a-200-year event?

7 And if we really believe that we're having a
8 global warming which may end up resulting in less
9 rainfall, then maybe a once-in-a-hundred-year event
10 which we experienced in 1988 may not be the base plain
11 that you determine what is the low water reference
12 point that you need to design for. Issues that need
13 to be thought out.

14 The other thing is from a navigation
15 industry standpoint, we rely greatly on the modeling
16 capability of the Corps in terms of the flow
17 characteristics of structures that are placed in the
18 river system whether it's a large scale model or
19 whether it's a micro model, but the St. Louis district
20 issues here in many cases can determine.

21 So somehow or another, the industry needs to
22 be concerned with these things, these systems that are
23 placed do not create adverse current conditions that
24 may be hazardous or a fabrication.

25 I think that's the list of concerns that I

1 have. The other thing, at some point in time, you
2 need site-specific plans that show the exact location,
3 show the exact relationship with the vertical
4 elevation, the top elevation with respect to the water
5 level. Otherwise we have no way to really base a
6 determination whether or not it could be adverse to
7 navigation and whether it's a non-issue.

8 Somewhere along the line detailed site-
9 specific type drawings and plans have to be available
10 to be able to address those kinds of issues other than
11 hearing a general objection about anything. But you
12 know, we're interested in looking at these, but we
13 don't want to see them adversely affect the movement
14 of navigation throughout the Mississippi River system.
15 Thank you.

16 MR. ALLAN CREAMER: Okay. That was our
17 only speaker who signed up, so we have plenty of
18 time, so we can continue with the questions. If
19 anybody else had any statements they want to make, I
20 would say now is the time.

21 MR. JACK NORMAN: Thank you. Jack Norman
22 again. First of all, in line with the comments we
23 just heard, I think we need to be concerned about the
24 resilience of this system given the changes that occur
25 in flood times on the river, given the implication,

1 perhaps, of those as the climate changes, who is going
2 to be keeping track whether the position of these
3 things is still appropriate as the river changes? The
4 Corps can tell the river what to do, but even the
5 Corps doesn't expect instant obedience all the time.

6 MR. RAY GAWLIK: Ray Gawlik, St. Louis
7 County. Is it too early to ask an end-user question?

8 MS. RAMYA SWAMINATHAN: Try us.

9 MR. RAY GAWLIK: Okay. There are existing
10 utilities in the area already. Are you guys going to
11 coordinate or compete with them? Also, is the
12 distribution grid going to be separate from the
13 existing distribution grid or are you going to have
14 another distribution grid?

15 And also, what are the incentives to the end
16 users to use you instead of the existing utility?
17 Also, what is the diameter and the length of the
18 existing turbines that you guys plan on putting in the
19 water and how many are you going to put in?

20 And you had talked earlier also about the
21 bearings being lubricated with water. The Mississippi
22 River is full of mud and silt and sediment. And those
23 are abrasives, so all this water will be abrasives to
24 the bearings that you're going to be lubricating, so
25 anyway.

1 MS. RAMYA SWAMINATHAN: There's two
2 categories of questions, although I do confess that I
3 lost track. I will take a stab at the business ones.
4 Chris can address the technical ones. If we don't
5 answer, please ask again. You were asking about
6 cooperation with local utilities.

7 It's certainly our intent to cooperate with
8 them as much as possible. Those conversations we're
9 having up and down the river are in their initial
10 stages given where we are in the scoping process. So
11 we are reaching out to utilities. And we welcome to
12 the opportunity to connect with any and all of them
13 near our project areas.

14 And I think the question about distribution
15 grid is connected to that in the sense that really
16 depends on the form of output and offtake that's
17 ultimately negotiated. And that form will be very
18 site-specific, meaning there might be sites where an
19 industrial or commercial customer would be a direct
20 offtake by that utility.

21 There might be cases in which we are
22 excelling into the wholesale grid. There might be
23 cases with cooperative negotiation in utility forms.
24 And I think that the response about what form of
25 transmission or distribution is going to take is going

1 to be highly specific to the circumstances of the
2 business relationship at every site. And for where we
3 are in the process, I think that's the most complete
4 answer I can give you.

5 I heard the question about bearings, the
6 diameter length and bearing, and I will let Chris take
7 over those.

8 MR. CHRIS WILLIAMS: Each individual turbine
9 device is approximately ten feet in diameter and about
10 four meters, 12-13 feet long. As you saw on the
11 slide, it sort of looks like it fell off an airplane.
12 Its overall shape is very much like a jet engine,
13 although the blade sizes are much bigger spots.
14 There's a lot of air between the blades for fish
15 passage and efficiency reasons of the device.

16 On the issue of the bearing, that is indeed
17 subject to great analysis and a lot of research on the
18 part of the engineering team. We are working with
19 companies who produce bearings for use in highly
20 abrasive environments.

21 In fact, one company has specifically
22 formulated bearing products that are being used now on
23 the propeller shaft bearings on ships on the
24 Mississippi River. A hydrodynamic bearing, meaning
25 lubricated by water, even if it's abrasive water,

1 where one side of the bearing is a hard polymer and
2 the other is metal.

3 These devices, these types of bearings have
4 been used for enough years on the river for a company
5 who we are in discussions with who have developed an
6 operating history and understanding their wear
7 patterns. We believe these materials are a very
8 suitable product.

9 Once again, it's not a high stress device.
10 The device is large. Its forces are not that large,
11 so it's not like you're dealing with a large diesel
12 engine that has lots of force involved. These devices
13 are lightly-loaded devices which takes off some of the
14 design difficulty in a number of areas, in particular
15 in the bearing. Does that answer your question?

16 MR. RAY GAWLIK: Yes. Can I have one more?
17 The expected life span of these generators?

18 MR. CHRIS WILLIAMS: That's part of a
19 business issue, the design lifetime and the lifetime
20 that we carry for the purpose of financing this
21 project is in the five- to seven-year period.

22 MR. ALLAN CREAMER: Anybody else have any
23 questions, comments?

24 MS. LISA MARESCHAL: One more thing that
25 came to mind from a geological perspective. Will this

1 have any impact in New Madrid, Missouri? They are
2 close to the fault line. Will this impact that in any
3 way, the flows generated from these under water?

4 MR. CHRIS WILLIAMS: The density of the
5 devices is such that it's not extracting a significant
6 fraction of energy, much less than 10 percent, in
7 fact. And other sources of variation in the force
8 from the river, the energy of water flowing downhill
9 from the head waters of the Mississippi have been much
10 greater, seasonal weather-based high-placed source of
11 variation.

12 So in the case of these turbines in the
13 river, it becomes a small perturbation in the energy
14 behavior of the river which is the thing which affects
15 how it transports the sediment flow, how it crosses
16 the channel in the places where it's not been turned
17 into a canal by the Army Corps.

18 While the overall amount of energy produced
19 by these projects is on the one hand significant, on
20 the other hand, it's not that much considering the
21 huge number of -- so we don't expect any impact,
22 although we are aware of the area you are talking
23 about.

24 MS. LISA MARESCHAL: The river flows right
25 through there.

1 MR. CHRIS WILLIAMS: We've learned a lot
2 about it in the last couple years. And the people
3 have been generous in the information provided to us.
4 We've got a lot.

5 MR. ALLAN CREAMER: Okay. Anybody else?
6 Now is the time. We're beginning a process that we
7 need to identify studies that need to be done.

8 MS. KIM ERNDT: Kim Erndt, E-R-N-D-T.
9 Assuming that some of these turbines are going to be
10 lost or struck from flood waters or debris that's
11 coming down river, how do you anticipate dealing with
12 those turbines that are lost?

13 MR. CHRIS WILLIAMS: We've not yet developed
14 any specific plans for those types of events. Just
15 observe there's an awful lot of stuff floating down
16 the river. And we are attempting to work with all the
17 various interested parties to include the Army Corps
18 and River Pilots Association to come up with
19 acceptable compromises.

20 MR. ALLAN CREAMER: Any other questions,
21 comments, issues that you want to put forward?

22 MS. SARAH FLORENTINO: If there are no
23 further questions or comments, I would just like to
24 reiterate that this brochure that we handed out at the
25 beginning of the meeting, I would encourage you all to

1 look at it to make sure you e-register first, and then
2 e-subscribe to the project number listed on the back
3 of the brochure to continue to follow the process and
4 be aware of the schedule, of the upcoming deadlines.
5 And we hope you all will continue to participate.

6 It seems like there's a wealth of knowledge
7 in the room, and I encourage you all to help us
8 throughout the rest of the process. Thank you. If
9 you have any questions, feel free to come up and talk
10 to me after the meeting or call me, e-mail me anytime.
11 With that, I will officially close. Oh, sorry.

12 MR. ALLAN CREAMER: One last thing. In the
13 scoping document I hope you all have is Appendix A
14 which lists seven criteria. You know, the process
15 we're beginning now is to identify the study plans,
16 studies that need to be done to address mainly the
17 questions that you all are raising.

18 And one of the things that needs to be done
19 when you're doing those studies, when you are
20 identifying studies, is to look at and you need to
21 address certain criteria. Those seven criteria are in
22 Appendix A in the scoping document.

23 And they're designed to help Free Flow Power
24 understand the need for the study, the nexus to the
25 project and what they're trying to do and potential

1 extent of the study you're looking for. So it's
2 extremely important that you address those seven
3 criteria if you're planning to put together any
4 particular study request that you would like to have
5 Free Flow Power undertake.

6 MS. SARAH FLORENTINO: All right. With
7 that, we'll officially close the meeting. Thank you
8 all again for attending.

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1 State of Illinois.

2 SS.

3 County of St. Clair

4 I, Catherine L. Turner, duly qualified and authorized
5 to administer oaths and to certify to depositions, do
6 hereby certify that pursuant to Agreement in the
7 matter of Free Flow Power Project to be used in the
8 matter of said cause, I was attended at the Holiday
9 Inn Select, 811 North 9th Street, in the City of St.
10 Louis, State of Missouri, by the aforesaid witness,
11 and by the aforesaid attorneys, on the 7th day of May,
12 2009.

13 The the foregoing transcript being by me reported in
14 shorthand and caused to be transcribed into
15 typewriting and the foregoing pages correctly set
16 forth transcript of proceedings together with the
17 questions and remarks and of speakers thereto and is
18 in all respects a full, true, correct and complete
19 transcript of the proceedings.

20 I further certify that I am not of counsel or attorney
21 for any of party to said matter, not related to nor
22 interested in any of the parties or their attorneys.

23

24

1 Witness my hand this 13th day of May, 2009.

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State of Illinois

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CSR No. 084-003727

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