THE FEDERAL ENERGY REGULATORY COMMISSION

SCOPING MEETING

SWAN LAKE NORTH PUMPED STORAGE PROJECT

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OREGON INSTITUTE OF TECHNOLOGY
THE SCOTT ROOM
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KLAMATH FALLS, OR 97601

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9:00 A.M.

P R O C E E D I N G S

(9:03 a.m.)

MR. WINCHELL: Welcome again we have got way bit less of a crowd this morning than we had last night. We had a pretty good turnout we had about I don't know between 70 - 80 folks. So I think for today we don't need to worry about listing the speakers so we can just go ahead and start with our program like we did last night and then I think the speakers can interject about any point if they choose to.

I just want to make sure that everybody here at today's meeting did sign in which I believe everybody did and then of course you have your scoping document and then the PowerPoint presentation.

Okay I'll start off by my name is Frank Winchell I'm an archeologist. I work with the Federal Energy Regulatory Commission and I am with my colleague Karen Sughrue who is a terrestrial biologist from FERC and then the other principal person today who will be presenting is Joe Eberhardt he represents the applicant for this proposed Swan Lake Pump Storage Project and the actual applicant is Swan Lake North Hydro LLC.

And then Joe represents them through EDF and Joe will go into more detail about that. Basically the structure of today's meeting involves our beginning of the scoping process where the Commission FERC, Federal Energy

Regulatory Commission is beginning their independent intensive environmental analysis and Karen will go into more detail about that.

But this is our first opportunity to come out and see people face to face and literally scope the aspects of this project as far as opinions, positions, issues and comments in general about this project. And the meeting is really is three parts. Basically it is going to be -- Karen will give a brief introduction and then Joe will go ahead and follow-up with his presentation about the project, will inform everybody pretty well about what's going to take place.

And of course we will follow up with our scoping document that Karen will go into more detail about the process and how we are going to go about doing this intensive independent analysis. Like I said I believe today we can be a little bit less formal so the comment period normally would be at the end that would be the third component of this process, the meeting this morning. But I believe with the small crowd we can go ahead and interject comments along with Joe's presentation as well as Karen's presentation.

A little bit about FERC -- of course we are in Washington, DC and we have got among other things we regulate wholesale electricity rates. We also cite or

certificate interstate natural gas pipelines and along with that we also do hydro-power licensing and we do licensing on all of those hydro-power projects that are non-federal which there are many, many, many non-federal hydro-electric projects.

As a matter of fact that's how FERC got started way back in the 1920's was by an Act of Congress who said we have got to get a handle on regulating these un-regulated private sector more or less hydro-electric projects way, way back when. So what it really winds down to is that we are going to look at this project and examine it very, very carefully to see if it really musters all the things that we feel would be in the public's interest. And again this is a long process where Joe had come in with an application representing his firm to propose this pump storage project back in October, 2015.

And then we will go ahead and start that review process beginning with our scoping that ultimately if we go through these environmental reviews and then it goes back to the Commissioners who are the ones who make the ultimate decision whether this project would get a license. These Commissioners are appointed by the President of the United States and have to be confirmed by the Senate so they are very important folks, but they are the ultimate deciders about this project.

I think that's it for me so Joe or Karen, thank you.

MS. SUGHRUE: Thanks Frank so I am going to briefly run through this agenda that we have for today so that you know the topics that we are going to cover and then what order so you already had just gone over some introductions but I am going to talk about a few housekeeping items for today and then Joe is going to give his description of the project and we are going to talk a little bit about the purpose of scoping and then go through each of the resources that FERC has currently identified that needs to be addressed in our environmental document and then we are going to talk about the schedule for FERC putting out that environmental document.

Then we are going to go over a few things that we are requesting as far as information from the public, the things that we need to consider for our environmental document. And then I will talk a little bit about our online resources for anybody who is interested in accessing more information about the project and then we will take additional comments.

So again we do have a sign-in sheet in the back so if anybody hasn't signed in for today please do so, And also we have a court reporter and so transcripts of this public meeting will be available on our online website

probably in about two weeks if you are interested in downloading that. And then if you are providing oral comment for today we would just ask that you be considerate of the time so that we have enough time for everyone to speak.

And then also you know so that we can get this down in the record please state your name and affiliation before speaking. And if you want to submit written comments we ask that you do that electronically or we would prefer you do that electronically but we do have a mailing address also available if you do mail that in though please clearly state the project number at the top and on the first page and this mailing address is also in our scoping document. And with that I will hand the presentation over to Joe.

MR. EBERHARDT: Good morning everyone a little smaller crowd than last night. I can play to big crowds and small crowds so we can make this more interactive as Frank was saying so as I go through and show you my roughly 25 slide deck -- we have maps and diagrams of the technology, et cetera feel free to ask questions as we go. I am going to breeze through this a little bit because we didn't go over it with the general public last night and for those of you that are from the agencies themselves, we sat down with many of you and have gone through -- and the project technology and how the project is designed to be laid out on

the landscape already.

So my name is Joe Eberhardt I'm with a company called EDF Renewable Energy and we are the proponent for the project. This project has been in development since 2009 so we are going on 7 years in the development. It is a very long timeline required for these projects. At the front end you have extensive studies that are done by the developer around biological, archeological and other aspects associated with the project. Feasibility from an engineering perspective so there is geo-technical work and investigations that are done.

All of this information is compiled in a very large document that is the FERC final license application which we filed with FERC back in October of 2015 with our design. So I want to hit on some key impacts related to the project. Some of these are positive, but when you think of impacts you usually think of the negative aspect but most of these are positive aspects here.

So economic, environmental and visual -- one of the key impacts for this county and this region is the job impact. This is not only a roughly 9 year development window at the beginning but once we get passed the development and we get issued a license by FERC we then can move into the construction period for this project. Construction on this project will take approximately 5

years.

This is a large civil works facility it has a lot of similarities to building a traditional dam a lot of concrete and steel is put into place, earth is moved around and that takes a fair amount of time and involves quite a few jobs. Once the project is operational it will have a license for 50 years in total. We will have eaten up 5 years of those during the construction process and we will still have 45 left to operate the project which is a pretty good life for a generation facility.

One nice thing about the civil works that we are putting into place is they actually have a fairly long longevity. They have life spans of up to 80 to 100 years with minimal maintenance and upgrade for the concrete, et cetera so this project has the opportunity to be re-licensed at the end of the initial license period and my expectation is that it will have a life closer to 100 years.

Environmental-wise this is not a traditional hydro-power project. This technology that we are deploying is a pump storage technology so it is a storage project not an energy project. Most traditional hydro-projects flow water down a river, hold some of that kind of dam and them pass it through the turbines that are in the dam that generate electricity.

In our case we are not on a river. We are not on

a lake, we are named after the valley which has Swan Lake in it which is an ephemeral lake we are actually on the other side of a hillside about two miles away from that lake. So we will be creating two man-made reservoirs, one up high on top of an escarpment 1,600 feet above the valley floor and the other one on the valley floor.

And what we are going to do is move water from the lower reservoir up to the upper reservoir through a large steel pipe and back, that's the process. We move the water uphill by consuming electricity so we are taking energy off of the grid converting it to mechanical energy and pushing that water uphill.

Once we get it into the upper reservoir we then store it as potential energy. That water can be released to flow back downhill through the same pipe reversing that system and the turbines then generate electricity so generating electricity to go back on the grid when you need it.

The benefits of this particular type of project since it is not on a lake, it is not on an existing waterway of any kind is that it is all self-contained. It is what we call a closed loop system so we don't have to deal with fish issues because we are not on a stream and a lot of the other environmental impacts you would typically expect related to a traditional dam that would back up water and flood out

some of the wetlands along the riparian sides not a problem here.

Lastly visual impacts -- this project was originally envisioned back in 2009 as a 1,000 megawatt facility which is a large facility. As we have gone through different studies and assessments of the economic fit for this project with the existing power grid we came to understand that a 1,000 megawatt project was too large and we needed to downsize this project.

So we brought the project down in size to 400 megawatts and this is a function of trying to fit the project into the existing electrical grid. The project is a very expensive project in general for storage technology. It is not as cheap as some other generation resources so we are looking at a project that is probably about a billion dollars in capital.

If we were to do the 1,000 megawatt project not only would we have proportionately more capital we would have had to do a substantial amount of transmission upgrades to the existing system to squeeze that 1,000 megawatt project into this system. That would have cost us almost another billion dollars on top of that. So by downsizing the project we have been able to reduce our costs, make the project more economically feasible and also because of the smaller size have less impact on the landscape and the

environment where we will be building it.

So a little bit about our company EDF Renewable Energy is a wholly owned subsidiary of EDF. EDF is Electricite de France so we are a French company based out of France, headquartered in Paris and we have a very long history in energy. EDF was formed after World War II ended to re-electrify the French grid which had predominately been destroyed in many areas and to kind of build the revolution of expansion that happened pretty much across the globe post World War II.

The same as what was happening in the U.S. with baby boomers was going on in France as well, the same kind of growth concept. So EDF was the electrical operator and the utility for France. They ended up becoming one of the largest utilities in the world. We are the world leader in pump storage technology. Here in the United States my subsidiary focuses on renewable energy and where pump storage fits into to renewable energy -- wind farms, solar farms -- is helping give those projects the capability to get on the grid and operate effectively.

So one of the key advantages to storage in our case bulk storage is that we can take surplus energy from wind farms, solar farms and park that energy in our facility -- that energy shows up when the sun shines, energy shows up when the wind blows -- it is not necessarily at the time

when you need it as a consumer. So we can park that energy until it is needed later and then bring it back to the grid.

So as a renewable energy company we see storage as a complimentary technology to the growth of renewable energy in the United States. What this map shows here is the states that we have been operating in where we have built wind farms and solar farms and you could see we operate in quite a few states across the U.S.

Our headquarters is in San Diego we have about 1,000 employees overall and are continuing to grow along with following that growth of the renewable boom in the United States. This map here gives you an indication of our experience with pump storage technology specifically. We have about 8,000 megawatts of pump storage technology deployed in France, those facilities were built commonly to facilitate storage of energy that was surplus to the grid from the nuclear reactors that we have in France.

What we are finding nowadays here in the United States as opposed to supporting nuclear or coal-based technology and having a place for that energy to go, renewable energy is now the new boom for pump storage in the United States. What you are looking at here each red dot is a country where we have operated and developed a pump storage facility.

We started with a back yard here in Europe --

France is here and so we started developing in our own back yard and across into Northern Africa. In the last 20 years we have been operating in Asia quite a bit with the boom in China and in general the economic boom throughout Asia so we have seen good opportunities there to develop projects.

Laos is where we built our last major project it was a 1,000 megawatt pump storage facility. The project that we have in front of FERC right now is a 400 megawatt facility and we have two projects that are sister projects to it. They are both 400 megawatt projects, they are both an above-ground penstock design one that we finished up last here is in Morocco and the second is under construction right now in Israel.

In total we have over 23,000 megawatts of experience of installed capacity and pump storage. This yellow map here is a map of the electrical grid it gives you an idea, at least in an electrical sense where the project is located, the 30 mile transmission line that connects the project to the Malin substation near the California/Oregon border which is the grey dash line.

And this location is a bit unique. The reason why we are trying to build the project here is the basin and range provides that relief, the topographic difference between a valley floor and a ridge line where we can separate these reservoirs by a great distance. When we

build these projects in Europe classically we are putting these up in the mountains and the Alps because again you are in a very mountainous terrain, you are trying to locate them in a place where you can get a very large head height between these two reservoirs.

That's one key aspect but another key aspect for Klamath County is this Malin substation. These lines here that continue on down to California transfer power back and forth between the Southwest and the Northwest and they have done that for about 30 years. This electron super highway is a great point to connect a project and to get on to that super highway and provide a wait station for those electrons.

So when there is excess energy coming out of California which has we see things is going to be predominantly solar over the next decade plus, that energy can be exported in part at the project we can store that and then we deliver it to the grid at a later time. Similarly here in Oregon, Columbia Gorge is filled with wind farms at this point. Sometimes those wind farms produce more energy than the local grid than the Northwest needs and we see exports of wind energy moving down to Malin. Currently those may be going into California and being sold into what we call the spot market, it is the real-time market.

You have got it you are producing electricity off

the wind farm you have to sell it right now. Well when you have a flood of anything coming into a marketplace and it is more than what can be consumed it depresses prices. So that's not good for the wind farm folks that are trying to sell their energy. We can provide a stop off point here for that energy which we can consume at the low price and then return it to the market later when it is actually more needed at a higher price and we can help realize better value for some of those renewable energy projects.

So this location is unique both from the engineering topography and from the electrical need. This graphic here shows Bonneville Power Administration and all of the wind farms as of 2009 and their output over a several day period. So we are looking at January, 2009 on from the 5th to the 28th. What you see is a storm front come in deliver a fair amount of wind almost 1,000 megawatts on average. Storm fronts can be gusty and so we see variable output here jagged line -- then the storm front ends the lower pressure sets in until the next storm front comes a few days later.

All of these wind farms went from 1,000 megawatts on average of generation being provided to the grid to zero. That's a substantial difference for trying to manage the grid. A storage project like ours has the capability to take excess energy from this time frame and to re-deliver it

during this time frame leveling out these differences day over day.

Also we have the capability through flexible dispatch of the turbines to fill in these gaps as well and smooth out this distribution it's one of our flexibility capacity aspects that brings good value. This graphic here looks at the second quarter of the year so we are looking at May, 2011. Again Bonneville Power Administration and what they are showing is the various key categories of generation. This is the snow melt and run-off period. Hydro-power dominates the output, this is in gigawatts so this is 1,200 -- 12,000 excuse me -- 12,000 megawatts of power being generated just from hydro-power that's the blue.

Green is the wind generation. It was also coincident with that and the thermal generation -- there isn't any, excuse me there is very little it is down here and that's associated really with balancing the grid. The thermal generation during this time frame is just not cost effective to dispatch.

If you are familiar with the area and the dams around here quite often we get so much runoff during May or early June that those dams have to spill water they can't actually run anymore electricity through the project -- water through the project to create electricity. Sometimes that is a function of too much water, physically they can't

run it through the turbines and they have to spill.

Most of the time though it is really a function of electrical demand from consumers -- so when you look at what this line represents here this is the demand of the grid and all they are doing is they are providing a supply stack to match that grid. What happened during this particular window was that wind farms had to be curtailed during these light blue periods because there was too much coincident wind and water generation going on at the same time and the electrical demand was not there from the grid to support that.

Our project can help take the energy from this time frame store it, allow these wind farms to actually operate. In these instances they were curtailed by BPA. A quick overview of key benefits -- I've talked a little bit about peaking energy. Peaking energy is being able to provide energy during peak needs.

Flexibility I've spoken about also that's the jagged line on the BPA curve. We can help smooth that line out providing energy as it is needed on an essentially four second basis so very rapid response and being the additional load sync for surplus energy when the demand is not there on the grid.

It makes no sense to build wind farms and not have that energy being produced if the wind is blowing. We

want that energy produced. If we can find a place to store it such as our project until it is actually needed -- different story -- then we are getting the maximum benefit out of those wind farms and displacing fossil fuel resources that otherwise would have had to run.

Transmission -- I talked about downsizing our project to 400 megawatts. In part that was to reduce the incremental amount of transmission we would have to build to interconnect our facility to the grid. What I am talking about here with this bullet point is getting more efficiency out of the existing transmission grid itself. So on that electron super highway moving energy back and forth that line was designed for peak needs, most things in the electrical business are designed for peak needs so that any time you go to flip on the light switch or your water heater kicks on and heats your water, it is able to provide electricity on demand as needed.

That major transmission line is only utilized at its peak capacity about one month out of the year the rest of the year that capacity falls off to as low as about 30 to 40 percent. Our project will allow more energy to flow on that line and get greater utilization out of the existing transmission line by bringing energy to our project which we will store typically during evening hours when demand is low and we will be able to put that energy back out on the grid

during the day during peak hours so better utilization out of existing transmission.

The second item here greenhouse gases and the portfolio effect are tied together. This is displacement of other existing fossil fuel resources. So if we could provide peak energy cost effectively at the same time that another diesel or natural gas peaking generator might have otherwise fired up and ran for a two hour or four hour period to help cover off demand due to the air conditioning load for instance here in the Klamath County area during the summer, we can displace that unit and therefore displace the greenhouse gases associated with that unit as well and by doing so we are doing it at a lower cost so the portfolio effect is effectively the idea that we are displacing this higher cost fossil fuel generator with a lower cost storage energy that we have been able to put into the project.

I am going to hand it over for a moment to my associate Ben Ludwig to talk briefly about some of the economic benefits associated with the project in particular jobs.

MR. LUDWIG: Thanks Joe. I am going to try to keep this brief here. I love this slide maybe a little too much. This is telling the story of the jobs that will be generated by the project. It is based on an economic impact analysis study that we have done for the project in Klamath

County. We do a lot of these on our wind farms and our traditional renewable resources that we develop in different counties in rural areas all over and so I read these and I am struck by the fact that one of these jobs in the pre-construction phase is mine and I get to participate in this.

So in the red you have direct employment of the construction of the project over the development construction cycle of it as well as -- so you can see that it kind of ramps up peaks out in year 3 and then goes down and then year 4, 5 and 6 there's going to be de-commissioning work and clean-up and a lot of activity to make sure that the project is properly set up so that it can run efficiently.

Additionally there are secondary jobs that are generated by the cascading effect of the workers directly employed by the project you know filling up their gas tanks and changing their tires and going to restaurants and staying in hotels and at the margins there are small businesses that benefit from these economic activities.

A lot of the areas that I go to in rural places like Texas and Oklahoma and Kansas I don't always feel they are able to efficiently optimize the benefits of that economic activity. I have been working -- I have a background in environmental science. I have been working in

coming to Klamath Falls for about 10 years now and I have seen it grow and I really feel that this area has the potential to extract all the value from that activity and optimize the benefits of the construction of this project.

It's going to be no doubt an economic boost for the area but I think it is something that the area can absorb effectively and benefit from going forward for years to come. So once the project becomes operational one of EDF's core competencies is a renewable services department that does operations and maintenance on projects going forward.

There's a strong likelihood that that will be the case and so you will have about 11 jobs related directly to the project and some of these are entry level jobs you know that are harder to create in rural areas and there is a lot of flight of youth in certain rural areas that I go to and entry level jobs are one way to get young people some experience in their home towns so that they can move forward and develop in this new economy that we are trying to create for the middle class.

Additionally there are service jobs related to the economic activity of these directly produced jobs. These are restaurants, retail service outlets, things like that. There will be construction jobs. We always have to do a weed abatement contract, a snow removal contract, we

have to sometimes upgrade our buildings and these are the construction jobs that will go out to local businesses in the area.

So that's the multiplier effect that you get. It's about a 3.2 ratio of the direct jobs on the project that create an ancillary cascade in the community.

Lastly these are the direct benefits to Klamath County and Oregon at large. When I go to a lot of rural areas and work on wind and solar projects you see people from Oregon and you know them because when I go out on site and visit with construction workers they say oh you are from Oregon and then they say oh we have a guy from Oregon and then they bring him over because he is super nice and Oregonians are really nice and they always want to chat with them.

When I started doing this work about 10 years ago as an environmental consultant I monitored on a lot of the wind projects that were in Sherman, Malheur County, Klickitat up near Dayton, Walla Walla, those areas went in and I met a lot of local Oregonians, Washingtonians, people from Idaho who spend a lot of their life 9 months a year, 10 months a year working in Texas, Nevada, California and they were so grateful to be back home near their families working on a meaningful renewable energy project. They had a strong pride in that and so what this slide captures for me is that

we have the workers, the skilled workers, the blade operators, the D-8 operators, the construction engineers, the electrical engineers to do this project with local labor here in Oregon and Washington and let some folks come home and work in their home state where they desperately want to for a couple of years.

That's how these slides kind of speak to me. I tried to be a little more clinical about it today and keep my remarks brief.

MR. EBERHARDT: Thanks Ben. A little overview of the project characteristics related for the Swan Lake North Project. This map here shows the project in the upper left-hand corner for the main facilities, the two reservoirs are the blue little bubbles you see there. The dark blue line you see moving off to the bottom right-hand corner is the proposed transmission corridor so we are proposing a 230 KV transmission line at this time.

The prior project which was proposed at 1,000 megawatts would have required a much larger transmission line -- a 500 KV line. By downsizing the project at the main facilities we have been able to downsize the transmission line as well. So by going from the 500 down to the 230 KV we have had the advantage of being able to drop the tower height from about 180 feet to 90 feet in height so they would be less visible which is great.

The poles themselves are mono pole design as opposed to a lattice or an H tower design so predominantly they will be mono pole. Given the terrain is very rugged terrain in some cases we will have to put H poles up but they will be infrequent. The change in design -- the 500 KV line was pretty huge ran the same length but those towers being as tall as they are gave us the opportunity to swing across large distances of up to about a third of a mile between the towers.

By going with the shorter towers we actually cannot swing a line quite as far so the number of towers will be increased. We will have about 200 towers as opposed to the prior design that had 90. But again being shorter towers I believe they will fit in the landscape a lot better and provide us more opportunities to turn that line, that's important. Having more towers gives us the ability to have more segments in the line and the ability to shape it and turn it to go around property lines, to go down property lines and as best as we can fit it into the private as well as public landscape.

The project head height as I indicated was 1,600 feet. This is a very good number. Many projects that I look at have moderate quality projects have about 1,000 head feet of height. In California where similar projects have been proposed they are working with head heights as little

as 600 or 700 feet which is considered a low-quality project.

So you can think of this as tossing a rock off the cliff right -- if the rock fell 700 feet as opposed to 1,600 feet about double the distance, the rock falling off the higher cliffs is going to fall harder right when it hits the ground, more forceful impact. We are doing the same thing we are just pushing water off the top of the hill right from the upper reservoir falling to the lower reservoir and so for the same turbine that is parked at the bottom of that taller cliff we are going to get much more energy out of that facility. So a high head height is a very important aspect.

We had a meeting here last year with OWRD they hosted a meeting talking about water. We are using ground water from a private source from existing wells to support this project so all of the water that goes inside of the facility and is re-circulated through this closed loop system is all from ground water so we are not using any of the lake water in the area, we are not using any river water, no terrestrial water at all.

As I mentioned we are connecting into the Malin substation and at that Malin substation is one of your local utilities Pacific Corp. Now we are not quite sure yet who are off-taker, who our customer is going to be for this

project, we are still in the earlier stages of development and we may not actually have a customer lined up until we get to the FERC license issuance.

We have two key critical path items for this project to be successful. One is the FERC license issuance and second is having a customer who will actually purchase the power or may just buy the project outright from us after we construct it. Those are two key items for this to move forward and they are kind of sequential. Quite often a utility customer will wait until the license is issued before they have more faith that the project has viability. So we are in a sequential waiting game.

As mentioned the project is a closed loop system. It will have ring dams. In this diagram they are shown as circles, I will show it on a different map in a moment. They are not quite circles when it comes to fitting them into the topography.

This is a schematic cutaway of the project. I have talked about the upper reservoir and the lower reservoir and the steel pipe connecting them. Let me kind of dissect that a little bit and give you a better idea of how the different key features of the project fit together. So in our case in Swan Lake Valley there's a valley floor and on this valley floor we are going to build a man-made reservoir that will hold water at the lower end.

We will also build a reservoir up on top of the escarpment just up beyond the rim edge itself, about 150 feet back which will help hide it because the slope on the backside of that is fairly substantial and this is where we will store water when we move it uphill. Down here at the bottom reservoir adjacent to it is the powerhouse. It includes reversible pump turbines. Now when they operate in pump mode they consume electricity from the grid and we push water up the steel pipe that's above ground into this upper reservoir and we store it until we need it. When we want to generate electricity they take the potential energy of the stored water and use gravity to recreate the momentum we need to spin these turbines that are now operating in a reverse mode to create electricity.

Electricity comes out into the switch yard and then continues on to the transmission path to the electrical grid at Malin. When this project was envisioned about 7 years ago now they initially had started with the concept of a below ground powerhouse. So we are looking at a facility here that is 600 feet below the ground and a shaft that would have brought water down to the powerhouse that was 800 to 900 feet deep. That would be one of the deepest excavations in the United States actually -- it required very specialized equipment.

When we took over this project from the former

developer who had envisions this 1,000 megawatt underground facility one of the first things we did was geo-technical investigations to drill this area to understand what the rock looked like in the escarpment on the Swan Lake rim. And what we found was that it was your kind of typical basalt and ash flows that you see here throughout the southern Oregon area. They are layered and as a result usually that ash layer in between the solid basalt flow levels is a bit crumbly.

When you are trying to drill a giant shaft through that material that creates problems -- the first problem is worker safety. Working down in a crumbly mine shaft is not a very safe environment. Secondarily it requires a lot of additional costs from the developer to provide reinforced concrete and steel to ensure that this doesn't collapse in on itself.

Based on the information that we gathered from the geo-technical studies we determined that this was not a feasible design and so we eliminated this characteristic from the project and chose to go with an above-ground steel penstock, we will talk a little bit more about that later on but this item here is actually as common as the underground facilities.

This is preferred when you have more of a granitic type rock, more of a solid rock surface -- excuse

me rock element which we don't have in this case. So we have gone to a good Plan B.

I want to give you an overview of the project's land impact. Where is it? What does it cross? This is a map book atlas you will find this is the presentation you can take it with you it is back here on the table in the back corner. Each of the next slides are blown up excerpts from this map you can find them referenced on this first reference sheet.

We are going off up here where the main project facilities are and then quickly go down the transmission path to the Malin substation. This excerpt shows the upper reservoir access road. It comes off of the road just north of Derry. This entire area is a corporate timber farm it is crisscrossed with a maze of dirt roads and has been recently harvested over the last 10 years. The last time I was out there to visit a lot of manzanita is growing back in place and a few trees.

I expect they will not be harvesting again there for 10 to 20 years until those trees regrow. In the meantime we are looking to take this existing dirt road and to reinforce it with rock in its surface bed so we can be able to get our construction vehicles in adequately. That road continues here to the upper reservoir and so we have an upper reservoir as I showed in the schematic and a lower

reservoir and connecting these two is the penstock. That's that steel pipe. The penstock is only 4 meters in diameter. It is a large steel set of rings that are welded together.

It has approximately -- yes Perry?

MR. CHIOCKTOOT: Question off mic.

MR. EBERHARDT: Good question. So the rock that we intend to use for building these ring dams around the reservoirs is related to excavation within the actual pocket where the reservoirs are. So first off we located these reservoirs in a manner that they fit into bowls in the earth to minimize the amount of excavation that we have to do.

And then secondarily the rock that comes out of these reservoir locations will go into making the rock wall around that, the ring dam that supports and holds the water. This penstock as I was indicating is only about 4 meters in diameter. It runs for almost 2.2 kilometers all the way down to the powerhouse which I showed in the prior schematic and then connects up to the lower reservoir.

So we are flowing water from here to here to the upper reservoir and back down. Sure Frank?

QUESTION OFF MIC

MR. WINCHELL: So this is a reminder you guys when we talk, state your name and your affiliation first and then ask your question.

MR. CHOCKTOOT: Perry Chocktoot, Director of the

Culture and Heritage Department of Klamath Tribes. And what I was asking was the rock that you were talking about making the cribs was it going to be local rock or brought in rock and my concern was some of the rock features close could be mistaken for just a pile of rock and they actually are not and they could be disturbed.

While we are on the subject of rock I wanted to make sure that we understood that rock features are automatically eligible for the Federal Register. There's no investigation needed. They are automatically eligible because the rock features that we are talking about in the two reservoir areas in the transmission lines are on private property, the majority of them, they are covered under state law.

And there are two Oregon revised statutes to protect cultural sites on private property -- known cultural sites and they have been diagnosed by historical resource associates Brad Douton in that company. So I was kind of concerned about the rock when you rock, thank you.

MR. EBERHARDT: Certainly so the answer to that question -- I will repeat it is that we are using rock from this location we will not be bringing in any new rock, it is not anticipated. We actually will adjust the height of the reservoirs to adapt to the quality of the rock. So if we find that the rock quality is not so good, you can't get

large boulders out from the riprap that's needed to go around the ring dam we will end up actually sinking that reservoir further and further into the earth and thereby minimizing the amount of ring band that is required around it.

I kind of think of it as a swimming pool in your back yard. The current plan is for a dam, a ring dam that holds about half of that water volume above ground and about half below so it is a balanced approach to holding the water. If we don't find quite the quality of rock that we want in this area as opposed to importing rock, we will just dig a deeper hole and at worst we end up with an in-ground swimming pool. It is entirely at ground level and below.

Moving on here you can see the power house in the beginning of the transmission line that moves out. It continues on around the beginning of the ephemeral Swan Lake, this is all in our CS conservation lands, wetlands. And what you are going to find as I go through these maps I am going to speed up my conversation here a little bit is that we have tried to dodge and duck to go around pivot farms and other private property concerns as much as we can.

Unfortunately the line does have to bend and sometimes where it has to bend to get to where it is going it doesn't always fall in the most ideal place. So again we are wrapping around the ephemeral Swan Lake itself and most

of this area is a wetland when the area floods. The transmission line continues on -- as you will notice north orientates a little bit differently as we try to fit as much of this map onto each page as possible.

The light green here I should back up is all BLM land so we are looking at the key facilities this is where the bulk of the cost for the project is. We try to stay as much as we can off the BLM in this particular area and back from the Swan Lake rim realizing that there is cultural heritage related to the rim itself so bringing this facility back about 150 feet from the rim we are hoping helps with that to some regard and also the only aspect that we cross the rim at is with this 4 meter pipe. So the top of the rim is right here and about 2 kilometers down the bottom of the rim excuse me -- the bottom of the escarpment is right here. And this slope in between these two locations which is almost all BLM land would be equivalent to like a black diamond ski slope if you are familiar with skiing.

Here the transmission line follows the bottom of the escarpment again dodging pivot farms moving on out to where it crosses the highway to Derry, Derry is located here. We come across move back onto BLM land -- so we ended up with 40% of this project, the transmission part being on BLM land which I think has satisfied many of the private land owners by pushing it off of private lands as much as we

can.

This is the Harpold Dam area. Transmission line comes in down the ridge, each of these dots is a power pole. Notice there is a power pole here and there is a big gap that goes over here but this location will probably have a slightly higher power pole but this is also a valley so we will be able to jump across that and try to minimize our impact of poles in that location.

And finally we get down to the Malin substation which is this large cut-out within the BLM land area. We are going to connect to the south side of the Malin substation and at that point we will be on the main grid. Some folks asked well why didn't you connect to the grid a lot closer, there are a lot of other lines that are out there?

The reality is given the project size and the 230 KV line that we need to interconnect with -- we need to connect to a location, a substation that can support a 230 KV or greater transmission facility. We are not able to connect to the wooden poles or distribution lines that you commonly see around -- we have to connect into the next higher level of transmission grid.

In our FLA filing which you can find online on the FERC website there is a variety of KOPs these are our known observation points. Some of these were recommended by

different agencies like the BLM because they were interested in knowing what the view would look like, the view shed impact from the project and so we went out and took photographs of these various locations -- I believe there's about 25 of them altogether and did a computer mock-up of what the project elements in that view shed might look like.

In some cases it's just a transmission line. In the case of looking at northern Swan Lake Valley that's where the main facility is, you can get a better idea of what the reservoirs might look like as well as the power house. I have exerted one of these to include in this presentation with the before and after photo and what we are looking at here is the closest public vantage point to the main facilities.

This photo was selected for that purpose. At the Swan Lake Road that you see shown in the photograph we are looking across to the far hillside, the east side of Swan Lake Valley and we are looking at the penstock because it is only a 4 meter diameter pipe that runs down through the escarpment but it is a linear feature so it will stand out a little bit. We will try to camouflage that as best we can with various types of colored paint to blend into the escarpment natural colors as well as re-vegetating some of the area around it to try to reduce the visual impact.

The actual powerhouse sits here behind this hill,

this dark green object. This is Grizzly Butte and the reservoir for the lower part of the reservoir actually sits on this. The trees there are about 60 to 80 feet tall, the height of the reservoir is about 40 to 50 feet so we are well tucked underneath the trees so far as looking at the project from a side view.

The transmission line leaving the powerhouse runs out over Grizzly Butte's saddling down the valley floor and that 230 KV line is so small at this distance almost two miles across from the road to the escarpment that the transmission line is not visible at all, yes Perry?

MR. CHOCKTOOT: Now when you are talking about visual impact you also have to take into account that BLM properties on that rim -- the BLM properties are in fact public domain so Native American people up there doing vision quests will have an impact -- a visual impact from this project both from the top of the butte in the basin and the penstock up on top because BLM is all over the top of that rim.

So there is in fact a distinct visual impact for the religious traditional practitioners. Oh by the way I'm Perry Chocktoot from the Klamath Tribes.

MR. EBERHARDT: Thank you Perry. So I believe 2 of the 25 photo montages that were created are from the top of the Swan Lake rim and they purposely were mocked up to

give that idea what it might be like to stand at the top of the rim and look out across the valley. So I would encourage you to look to the FERC website in the FLA and get a better idea what those are.

They are about a 10 I think about a 10 megabyte file so you can extract the file and blow it up and kind of zoom in on different features and get a much better idea.

MR. CHOCKTOOT: I have in fact been on that rim above your project area. I couldn't tell you whether I could see your project or not because it is not in place yet but I have been in spots up there where I could in fact see the top of Grizzly Butte and where you propose to put this and this is out in areas that religious traditional practitioners would go to do their ceremony.

Our ceremonies take a few things as a pre-requisite. You have got to be in an area that is free of clutter to the eye, clutter to the brain, clutter to the mind and converse with our creator that is out on points, that's on the very edge. We have some vision quest sites that platelet sheer creates its own wind so some of our old holy men would actually lean out over the expanse because the wind would hold them up so it is an intense religious experience and it's going to be a definite impact to our religious practitioners to put something out there that has light, may or may not, we haven't got a clear picture on

that yet.

But the penstocks are definitely going to show up at the top of Grizzly Butte, you can see that anywhere on the top of that rim. Perry Chocktoot of Klamath Tribes.

MR. EBERHARDT: Thank you for the comment Perry. So now I am going to turn it over to Sandy Slayton with ERM. ERM is an environmental consulting firm they have assisted us with compiling many of our studies that have gone into the FLA. She's also helped with agency outreach in developing various mitigations and plans for management related to the project so Sandy?

MS. SLAYTON: So I'm going to talk to you about the protection mitigation and enhancement measures that we have developed for the project. There's a fairly extensive package of we call these PM&Es that have been developed and they are available in the final license application and they are also bulleted out in the scoping document that FERC put together. So I am not going to talk about all of them but I did want to go over some that aren't quite as straight-forward or aren't really spelled out in the bullets that are in the scoping document.

The PM&Es address potential impacts to water resources, recreation, land use, esthetics, cultural resources, soils and geology, botanical resources, health and safety and wildlife and as lot of these are contained in

some plans and programs some of which have been fully developed and some of which will be developed throughout the licensing process.

This includes a soil erosion control plan, a spill prevention and clean-up plan, water quality monitoring and management plan, traffic safety plan, a public safety plan and then a historic properties management plan. There's also some recreational PM&Es being developed including potential educational interpretative facility that would give tours of the Swan Lake Project.

There's a Revegetation and Noxious Weeds Management Plan that's been fairly well developed that's available in the final license application and this includes pre-construction, noxious weed surveys, weed control during construction and then re-seeding and planting and that's particularly relevant for the transmission line access roads because those will primarily be temporary and after construction the roads will be removed, regraded and then replanted with monitoring happening to make sure that the replanting is a success.

So those are contained in that Revegetation and Noxious Weed Management Plan and then additionally there is a wildlife plan that has been developed that has a suite of PM&Es to address potential impacts to wildlife some of which are duplicative of what is in the revegetation plan

obviously because wildlife habitat and revegetation are linked.

The wildlife plan also includes an avian and bat protection program and Ungulate Protection Program and then some additional measures that are sort of outside either one of those programs. The avian and bat protection focuses on the transmission line and also on the raptor nests that are located in the Swan Lake area, the one active raptor nest specifically.

There are pre-construction raptor surveys that will look to make sure that raptor nests that we think are active are active and that any new nests aren't found or any inactive nests aren't found to be active. We will do additional consultation where it is needed if anything is changed. Bird flight diverters are proposed and actually it is more like 5 locations and not 3 along the transmission line corridor and I will show you a map of those.

Those are sort of the pigtail shaped diverters that hang on the line and hopefully will avoid some collisions. We will minimize lighting around the project and install fencing around the reservoir. The reservoir isn't providing wildlife habitat so we want to keep everybody out of there.

And then also the monitoring of the transmission line for any collisions with animals as well as the fencing

to be sure that nobody is colliding with or getting entrained in the fencing. Ungulate Protection Program includes ongoing consultation, dust palliatives for vehicles during construction. We have control which is included in every vegetation management plan, the decommissioning and revegetating of access roads we talked about and then wildlife crossing opportunities on the penstock. When the penstock design was changed from being below ground to above ground it creates a linear feature on the landscape and so in order to provide -- to not interrupt wildlife movement across the escarpment we looked at where we could provide for a crossing both over or under that penstock and I have a figure that I will show you where that can occur.

Additional measures that are included in the Wildlife Plan are land acquisition for conservation. There are some big game water developments that BLM's recommendation there's two spots that will be helpful particularly during drought times for all of us to be able to access water, some road improvements and access for BLM so that they can get to some of their lands to do habitat improvement projects and then also assistance to BLM with their Juniper removal project that is included within their Bryant Mountain Program.

So the wildlife crossing opportunities that I was talking about -- this is the upper reservoir, lower

reservoir is down here and the penstock is color-coded to describe where wildlife can cross. The blue parts are completely buried so obviously that is not an impediment and then the green -- the dark green areas provide up to about 12 foot of clearance for animals to cross under between 8 and 12 feet actually and then the light green areas provided over 12 feet of clearance underneath the penstock so the animals can keep walking along the escarpment there, under the penstock.

We have also looked at some lands for potential acquisition for conservation. The yellow hashed areas are the ones we are looking at here. These are private lands that are held within the greenish pea colored that's the BLM land so those private lands could be acquired and then we have also looked at some additional lands that are not quite as adjacent to the project that can provide some additional habitat value as well, we looked at acquiring those.

This is a really, really busy figure but this shows all of the wildlife PM&Es that we could throw on a figure all at once. Some things that I could probably point out there, the bird flight diverters are proposed here off of Grizzly Butte, right here and there's another one there this is duplicated on this figure. And then Harpold Gap and on down near the Malin substantion there -- water guzzlers are proposed here and here and then all of the blue polygons

are areas that are included within BLM's Bryant Mountain Juniper Removal Program, all of those lands would be supported by a certain number of acres of them could be supported through this project depending on how the mitigation acreage shuffles out with the land acquisitions.

And in order to get to this point with all of these PM&Es we have done a number of studies some of which had started at the beginning of this project well before the draft license application so a quite a bit of work has gone on into this. We started with ground water and well capacity testing to look at utilizing the existing private water source to fill the reservoirs and then for make-up water and also some water quality monitoring and modeling.

We did wildlife habitat and vegetation surveys throughout the entire project area including the length of the transmission line. We did a visual impact analysis that Joe talked about earlier that involved at looking at 26 different key observation points around the project area and putting together panoramic photos for before and after views of the project development.

An economic impact analysis that Ben spoke about -- we looked at a variety of transmission route alternatives -- at least 5 or 6 alternatives and then there were some small you know changes within those alternatives as well. We did a local traffic study and then a cultural resources

study and a geo-technical study. Those last two studies have been completed, we are initially in the first phase of each of those was completed but we are doing additional work on both of those studies.

The cultural resources study information will be used to develop the historic properties management plan and additional geo-technical work will be used to develop the final project design. I'll give this back to Joe.

MR. EBERHARDT: Thank you Sandy. The last topic to touch on here is water. In Klamath County water is a key concern. I just wanted to re-emphasize that we are using ground water we are not using surface water for this project. The project will use 3,001 acre feet of initial water so we have to charge the system during that first year right before operations and then after that we will have to re-charge a small amount about 12% each year to make up for evaporation as well as for leakage related to the project.

Inside those rock filled dams, the ring dams is a geo-membrane that lines them and helps reduce the amount of leakage. We expect leakage to be pretty minimal, less than 2% per year. The geo-membrane you can think of is like the flat roof material where they have got the white or gray tarp-like material, it is all welded together to keep the flat commercial roof from leaking. This is a very similar material just a little bit thicker.

Make-up water would be 428 acre feet. We are going to get the water rights from a private land owner who has existing wells who has been using this water since the early 1970's for agricultural purposes. To go through WRD we will seek a water transfer temporarily for the 3,001 acre feet excuse me to the project that will take about 8 months for us to fill and then we will return those water rights to the land owners, they can continue on with their agricultural purposes.

We will retain 428 acre feet on a permanent basis for our annual needs for making up for evaporation losses. We have done water testing as Sandy had indicated with regards to these wells and all the neighboring wells around them. We ran a one week test at full flow to understand what the impacts might be and the impacts on the wells were either zero or a de minimis amount. It is a very stable water aquifer in general and we will be operating well within the existing maximum draw capability of these wells.

The next step for the projects -- a key next step is the issuance of the FERC license. It is a little bit out we have to go through an environmental review process so we talked about what is going to happen between now and then with regards to development of the project. In 2016 as Sandy indicated we will wrap up the field studies related to cultural activities in the area.

In 2017 we will do additional field studies related to geo-technical and that will help us inform our engineering design so we can advance the engineering design to the next stage and start heading toward our final schematics with regards to that aspect of the project. And then 2018 based on the tentative schedule that FERC has outlined that is when we anticipate that the FERC license will be issued for the project.

And as I indicated that's a critical next step that will help us gather the interest of a potential customer for the facility. With regards to private land owners versus public land we are working with the BLM on a right-of-way agreement for all the BLM access that we need both for the key project facilities in Swan Lake Valley as well as the transmission line.

For private land owners we are going to wait a bit to engage them fully on land agreements namely because we want to make sure that we are further along in the process with FERC and no red flags have popped up in their initial review of the project that can't be addressed. That seems like the prudent thing as we step through this rather long development process.

As we have showed in the slide mostly related to jobs -- the development window in this project is almost 9 years in length. It is not atypical -- that's very typical

for these kinds of projects there is a lot of studies that have to be done, there's a lot of process, there's a lot of review by agencies locally and at the federal level and then eventually you get to the construction window which is about a 5 year window.

So 14 years in the making from start to finish for this project. Once it is completed it will have potentially up to 100 year life span so it is definitely worth the investment both in time and effort in making sure the project is done right. So that's all I have for you today. The last slide is just contact information. I also have my business cards in the back and extra copies of this presentation you can pick up, I'll turn it back over to FERC at this time, Karen?

MS. SUGHRUE: Thanks Joe. So now I am going to cover the purpose of scoping. The National Environmental Policy Act, FERC regulations and other applicable laws require evaluation of the environmental effects of licensing or re-licensing of hydro-power projects. So this process scoping is a part of NEPA and it is used to identify issues and concerns to be addressed in a NEPA document with input from all the agencies, Indian tribes, non-governmental organizations and the public.

So we are here today to discuss existing environmental conditions, potential information needs and

the resource issues that we currently identified. So the resource issues that we have identified are these listed on this slide and I will go through each one individually and ask for comments so for geologic and soil resources we have identified or we plan to address effects from erosion of the exposed and disturbed soils and soil resources and proximate surface waters, effects of shallow landslides on soil resources by either construction disturbances or the placement of excavation of soils on steep slopes, the effects of penstock placement along the fault line and potential rupture resulting in large scale erosion or landslides on soil and surface water resources and the effects of project operation on reservoirs, shoreline, erosion and bank stability.

So given those are there any comments or additional information that we are missing here that we might need to focus on? No. Alright move on for water resources the effects of project construction and operation on the water quality from the potential release of contaminants, effects of project operation on ground water quantity in the project area, the effects of project construction and operation on drainage patterns affecting fisheries and aquatics in project area water bodies and the effects of project operation on the water quality in the two project reservoirs.

Do we have any comments or additional information? Can you state your name?

MR. MOORE: Bob Moore. What is the size of the aquifer where we are going to be pulling this initial water out of and what is going to be the impact on that? It is probably an old glacier bed even though it has been there a long time we haven't really pulled on it agriculturally.

MR. EBERHARDT: The details are in the water study which is part of the FLA application. What I can say is the anecdotal comment that was made yesterday by the land owner and that was that there's about 120,000 acres of surface area in that water shed that feeds that sub basin and provides a recharge that allows them to have a static water level that they have maintained for decades given the maximum draws that they take for agriculture.

So they have not had an issue and their expectation having been there for going on 40 years now is that they probably have a recharge rate that is 2 to 3 times what the actual draw is so the glacial water right versus more current water from run-off and from recharge most of the water is coming from the recharge from that Swan Lake Rim, Swan Lake Mountain and that higher plateau area where they get snow during the winter quite often.

MR. MOORE: But you're still going to be pulling off of a glacial aquifer but you have no idea of how large

that aquifer is?

MR. EBERHARDT: I don't know the answer to that off the top of my head. It has been studied by water hydrologists and reviewed by the state through OWRD.

MR. MOORE: I know this is all mapped but I didn't know how that was put into your program?

MR. EBERHARDT: Yeah.

MR. MOORE: And they have Owens Valley and all of these others where when we pulled on those and they are not good anymore.

MR. EBERHARDT: Exactly they have had draw-downs right, especially during the draught years.

MR. MOORE: And I mean we are pulling on just agriculture naturally the agricultural community isn't going to be pulling the same amount here that you would have for large amounts for your initial filling of these reservoirs. I have another question since you are up can I ask that?

MS. SUGHRUE: Sure.

MR. MOORE: What is the surface area of most of your reservoirs?

MR. EBERHARDT: So each reservoir is about 120 acres in surface area.

MR. MOORE: Both of them are about 120 acres?

MR. EBERHARDT: Yes we are moving the same quantity of water back and forth, so only really one of them

will be full at a given time or they will partially be full, the water will be split between the two of them.

MR. MOORE: I was just looking at evaporation.

MR. EBERHARDT: So the reservoirs given that the earth underneath them is a little different, they are not perfectly symmetrical in any regard. We tried to fit them into the topography as best we can. The lower ring dam I believe is about 45 to 50 feet tall and that's pretty consistent. The upper reservoir however since it sits on a slope, the back side, let me had this to you --

Basin and rain right so you have the valley that shifts, the ridgeline that rides up it is also tilted. So the back line of that slope looks like this so the ring dam on the back will have a higher side on the downhill side versus the uphill side. So the back side I think at its highest is maybe 90 feet and at the smallest or the upper reservoir -- I believe it is down to about 20 feet. It will be a level ring around the top.

MR. MOORE: I understand I was just looking at the evaporated quantity because that is going to be the biggest concern about new water going in and that's always going to be an ongoing --

MR. EBERHARDT: Let me go back to that first question though specifically. This aquifer has been identified by the state hydrologist as being a sub-basin

that is self-contained. So when you look at the -- where the rock filters the water underground there is actually a break between the north and the south part of Swan Lake and so from Grizzly Butte north that has a self-contained sub-basin and a lot of that recharge coming off of the escarpment and Swan Lake Mountain goes specifically into that basin.

The lower basin which feeds off into Poe Valley and the valley to the south that is a contiguous basin and so anything that would happen in that area would relate to the other draw-downs related to other wells but because the sub-basin we are in is self-contained it is kind of a micro watershed we won't have impacts on those other sub-basins.

MR. MOORE: Well that was what I was concerned about because your recharge is probably over millions of years to build that initially and if we pull heavy on it the recharge is not going to be that quick and we are in draught season and we have a lot of different things going on as our earth tends to change and we don't have our 3,000 foot of ice over us anymore to give us that support.

Maybe I'll let her have -- I have some more questions for you.

MR. EBERHARDT: Okay we can do more of a Q and A at the end maybe?

MS. SUGHRUE: If it applies to water resources

you know we are at that --

MR. MOORE: Some of these projects is in it --

MS. SUGHRUE: Alright we will go through the individual resources first and then we can address any additional questions at the end. Alright for terrestrial resources we have the effects of project construction and operation on this spread and control of noxious and invasive weeds, the effects of project transmission lines on raptors, water fowl or birds and other migratory birds and bats. The effect of permanent and temporary wildlife habitat loss due to construction project features, the effects of project facilities acting as a barrier to travel and migration of ungulates and other wildlife, the effect of noise and human presence occurring from project construction, operation and maintenance activities, and the wintering ungulates and breeding birds and the effects of projection construction operation and maintenance on special status species.

So are there any additional comments, any additional resources we need to address here? Issues?

For threatened and endangered species we are going to be looking at the effects of project construction and operation on short nose and long river suckers in the Swan Lake Basin. Okay recreation and land use -- effects of project construction and operation on recreation resources and recreational use in the vicinity of the project --

effects of project construction and operation on planned or existing parks, public land or access areas, dispersed recreation areas and trails in the vicinity of the project, the effect of project construction operation maintenance on agriculture, irrigation, residential and other land uses in the vicinity of the project.

Effects of construction traffic including dust and noise on land use and recreational use in the project area and effects of the transmission line on air traffic in the vicinity of the project. Does anyone wish to comment?

Esthetic resources -- the effects of project construction and operation on esthetic resources in the vicinity of the project, effects of light and glare from the construction and operation of the project on area residents, recreational use in the night sky in the vicinity of the project, the effects of construction and operation related noise surrounding uses including blasting for the reservoirs and powerhouse and the use of equipment and helicopters during construction.

No comments? For cultural resources we have the effects of construction and operation of the proposed project on historic archeological and traditional cultural resources that may be eligible for inclusion in the National Register of Historic Places.

No comments? Socio-economics -- effects of the

project on the local economy of Klamath County including conversion, productive farm land to energy development and the effects of the project on property values in the project area.

No comments? Air quality and noise -- the effects of project construction and operation on air quality and the effects of the project construction and operation on noise levels in the vicinity of the project -- still no comments? Okay.

Developmental resources -- the effects of timing on project pumping and generation cycles on the project generation, no comments?

For cumulative effects we have identified esthetic resources and the geographic scope for that is the Lost River Watershed and we will be looking into a 30 to 50 year time frame into the future. No comments?

So that was our list of resources we are going to be addressing. For the preparation of the EIS here is our preliminary schedule. So we are currently conducting our scoping meetings and based on the comments that we receive which are due in a month we may issue a second scoping document, scoping document 2.

And then in Spring of next year we expect to issue a Notice saying that the project is ready for environmental analysis and then we will have an additional

comment period after that and then by next Fall around October we hope to issue a Draft EIS with an additional comment period on that draft and then in March of 2018 around that time we expect to issue a Final EIS.

And so the type of information that we are requesting public comment on there's a complete list in the scoping document under Section 5. Here are some of our examples -- we wish to receive you know additional comments on significant environmental issues that should be addressed in this EIS or information or data describing past and present conditions of the project area, resource plans and future proposals in the project area and additional comprehensive plans and so for anyone representing an agency here please take a look at that list of comprehensive plans and if there is any additional plans that need to be included or any plans that need to be updated please submit those.

And then here's some information about our online resources. And you can essentially go to our FERC website at www.ferc.gov and down here in the corner you can find access to some of these additional websites to get to the project filing. So if anyone wishes to submit comments you can actually type in your comments under quick comments but that is just a shortened version. I think it has a limit of 6,000 characters so if you are planning to file extensive

comments you would use the e-filing system and that website should give you clear instructions on how to do that but we do have tech support that you can reach out to either by email at this web address here at the bottom as well as a phone number you can call.

Also if you want to read up on past filings on the project you can go to e-library and type in the project number and you can pull up everything that has already been filed to the project but if you want to receive future filing information you would go to our e-register web address and register your email address and so that way if anything new comes that is filed to the project you will get an email notification but you have to go and e-register first and then e-subscribe to the project and you would just subscribe to the project by again putting in the project number and just noting that, so that's all in the system and that's it for our presentation but if we have additional questions or comments we can go ahead and take those now.

MR. MOORE: Some of these are economic -- Bob Moore, some of these are economic or things more applicable to the developer.

MS. SUGHRUE: Okay.

MR. MOORE: Is this the appropriate place for that? Some of the things that I was concerned with Joe -- when we are dealing with the source for pumping the cost to

pump the water back up the hill you are looking at apparently some of the projects that you have for wind and solar or are you going to be working off the open market to buy the power that is available?

MR. EBERHARDT: Okay if I understand the question we will be working off of the open market to some degree but really it is going to be driven by who that utility off-taker is. So for example if Pacific Corp were to be the customer for the project they would be working with their resources, their wind farms, their solar farms, some of their fossil fuel facilities as well to move their energy around, to park it at this facility and then to take it back out later.

They also work in what we call open market purchases and sales so that means that they work with the open market to procure energy from other folks.

MR. MOORE: You have got quite a cost differential if we are working with Bonneville the hydro is going to be very cheap if you have access to that, I don't know if you do have access or what their allotments are but then if you are going to be dealing with wind and solar those are very expensive and if you are doing that at night as you are using this as your storage battery for your wind system and stuff like that how do these cost differentials work for you or have you got a model already and what it is

going to cost you to do your pump storage side of this.

MR. EBERHARDT: Sure so let me break that apart a little bit I think the first question about cheap Bonneville power was referring to what we call in the industry slice customers that have a preferential slice of the Bonneville federal dams. To the extent a customer of the project like in my example previously of Pacific Corp if they had slice power -- I'm not sure if they do or not, but if they did then that could be some of the energy going into this project.

But typically the slice powers I understand it falls to municipalities and to PUD's and to co-ops not to the independently owned utilities like Pacific Corp. This type of project typically will have customers who are independently owned utilities. In the Northwest we are talking customers like Pacific Corp, Portland General Electric, Puget Sound Energy, Avista Corp, Ida Corp. In the Southwest we are talking customers like Pacific Gas and Electric and Southern California Edison.

MR. MOORE: Okay but you still didn't quite answer -- I'm trying to get a cost factor out of you regarding --

MR. EBERHARDT: Sure, let me give you an example. So the project is likely to purchase power during off peak periods of when power is not needed on the grid. That cost

differential can be fairly substantial. At times of the year we might be able to procure power at $10.00 per megawatt hour, store it for a few hours and then return it to the grid at $40.00 per megawatt hour. That's a 4X increase in value.

MR. MOORE: Okay alright we are not getting quite where I am. What is your recharge time on the system?

MR. EBERHARDT: Okay so there are some technical specifics here. 400 megawatts average is the maximum capacity of the project. We pump a little faster than we can generate electricity. At most we will be generating electricity of 393 megawatts but we can pump at a rate of 415.

That differential allows us to pump up the entire reservoir amount, 3001 acre feet in about 9 and hours at full pumping speed. And similarly we can drain that upper reservoir and run it backwards through the system to generate electricity in about 9 and hours at the 3001 acre feet.

MR. MOORE: To load capacity?

MR. EBERHARDT: It does change with the height of the water, yep.

MR. MOORE: Back to here, your load capacity you are not going to always have 400 megawatt demand and you are going to govern those units I presume like you would a hydro

and so it is going to be whatever the system you are contracting with is determined at that time.

MR. EBERHARDT: Correct so the project will be dispatched by whoever the operator and owner and off-takers are kind of as a combined decision and so as that customer, as the utility has different demands, they are looking at a wide range of generation resources that they have at their disposal some of which are dispatchable like fossil fuel generation in the case of gas, natural gas facilities and some are less dispatchable like traditional hydro-power, you can hold water back behind the dam for only so long in that river and then you have to release it but there is a little bit of flexibility.

And then there are projects that are just not dispatchable at all such as your run of river hydro-projects as well as your solar and your wind farms. The only way to dispatch those is to turn them off. What we are trying to provide here is an alternative to turning off these green resources and finding a place to park that energy.

MR. MOORE: Maybe getting back to the wind what is your cost per megawatt on the wind power?

MR. EBERHARDT: So costs related to wind power vary by a number of factors one of which is location and just how windy it is. So for the same wind turbine that we would install at a particular windy location versus a less

windy location you could have easily a 20% difference in cost of the power related.

MR. MOORE: So once it goes on the grid it's whatever is on the grid but they have a contract for each of these wind farms and they are fairly lucrative and they do get quite a bit of money for the wind farms unless that has come down considerable and the same thing with the solar farms. I am just trying to get some comparison there because of the -- what I am looking at I guess is the net cost of you operating the power versus the recharging of your dam back and forth where the net costs coming out of a plant of this nature would be in this location.

MR. EBERHARDT: So this is a good location for this type of project. One thing I have to say is that -- that potential customer down the road, we haven't landed one yet. We don't have a contract with an off-taker and part of that is the result of market price forecast. What are the expectations of value related to this project?

What we are trying to do in this very long lead time in developing and then eventually constructing the project is deliver the project to the market kind of in a just in time fashion and what we are watching is the development or more and more renewables which is favorable and we are looking at restrictions on carbon production whether that is a carbon cap and trade or a carbon tax

coming out of California whatever the case may be as that legislative rolls through that frowns on fossil fuel generators again encourages more renewable energy to be developed.

And what we are trying to do with this project is look to deliver it to the market right at about the time when it is needed and I think that's critical so in looking at the value economics of the project at this point based on the current circumstances that argument is still being built, okay. So the future we are trying to target still is 7 or 8 years down the road and is a developing market and we still need a few things to go our way to make this a viable economic market.

MR. MOORE: But you are a peaking system -- are lines for a good portion of the year you mentioned they weren't but I don't know what they were pushing down them now they are not hitting the ground yet, probably about 3,000 megawatts of line but all three lines so we are talking about 5 to 9,000 of megawatts coming in from the north at the 500 KV level.

You are only going to be able to push so much, if we are coming through here you have already got an energy resource behind you feeding these lines elsewhere and you are in the lower end here for your peaking and you have to have room on the 300 to 500 KV lines going south and you are

probably looking at 2 PG&E lines after Malin to be able to get that power down to the customers and you have other stuff that is going to be building up on that as you keep going south.

I'm just looking trying to see how you are going to be able to fill your electrons into those lines during those increments on the load demands because we have a very bottleneck on those lines because they only have so much capacity and we have had problems with capacity on those lines for years.

MR. EBERHARDT: You're very informed on the electrical grid so this can be an interesting conversation. The quick answer --

MR. MOORE: Would it be better if you and I not tie up the meeting here for some of these questions?

MR. EBERHARDT: If you have ones that you don't want to have on record we can definitely have a deeper conversation off line but for comment periods I want to make sure that your comments --

MR. MOORE: Okay I just want to make sure that we are not tying up valuable time for the scoping here.

MR. EBERHARDT: I do have a short answer for this one and that is we will bump off other folks that are moving energy on that line. And that's a very simple economic concept. We are buying our energy during off-peak or low

load times and storing it so the same energy that moved from the John Day location all the way down to Malin and eventually down to California if it is say a $40.00 market during the day time they are trying to push $40.00 power it is like generating it in a $40.00 market and trying to move it to California.

We will have the evening before purchased our power during off peak at $10.00 let's say, stored it and when it comes to looking at Malin as a market traded energy company we will be able to offer our energy price anywhere from our purchase price of $10.00 up in this case in this example to the market price of 40 so if the guy up north at John Day who is delivering $40 power on the grid we just have to sell it at $38 and bump him off the line.

MR. MOORE: Okay let me get around to a couple of these others. I was looking you have 11 permanent jobs that are going to be here, what kind of wages -- everybody talks family wage but what kind of wages is your utility paying those type of people because you have varying -- I presume you are going to have like tenders or some type of an operating team?

MR. EBERHARDT: Yes we will be manned 24/7 at the project site.

MR. MOORE: Unless you operate those from a central location somewhere else in the nation.

MR. EBERHARDT: We will not have a -- we will have the capability for remote but that is a backup in case of terrorist event or something.

MR. MOORE: You are going to have hydro operators?

MR. EBERHARDT: We will have hydro operators also.

MR. MOORE: What kind of wages are we talking about per year for these type of people?

MR. EBERHARDT: So we had a study conducted by Ecklin Northwest, we had a third party economic analysis done and what they did in their modeling and forecasting for this was estimated the average wage of $60,000 in that study.

MR. MOORE: $60,000.

MR. EBERHARDT: Yeah.

MR. MOORE: For all 11 positions?

MR. EBERHARDT: That was the average.

MR. MOORE: So you are going to have some that will be closer to -- $38,000 or something --

MR. EBERHARDT: There will be supervisors.

MR. MOORE: So about 60K for them. Because we always talk you know market wage wages and all this family wage and that doesn't mean anything until you put a dollar sign.

MR. EBERHARDT: Until you put a number on it.

MR. MOORE: Okay that was what I was concerned. Those are permanent economic inputs from there but as you talked about you are leveraging through the system itself. A question, maybe not be pertinent here but over the last 20 years how many of these projects like this have you sold instead of operated yourself?

MR. EBERHARDT: Good question. So our business model is that we typically will build and then we will sell at the end of construction, roughly about half of the projects that we build and in that regard I am reflecting on our solar and our wind projects as well as hydro. When it comes to our French engineers and kind of their expertise where they have employed that around the world in many cases like in Laos we are building for the government, clearly it is their project.

And so in many of those locations around the world predominantly we have done mere of the technical advising and done the engineering for the project but had not been the owner of the facility. So we own everything in France.

MR. MOORE: You were just the builder?

MR. EBERHARDT: Yep.

MR. MOORE: Okay but in the United States --

MR. EBERHARDT: Well this is our first yeah I

should have clarified that. So we have a lot of experience throughout the world in developing and constructing pump storage facilities but one thing you may have noticed on that map it was not a world map, there was no North America or South America. This is our first foray in the United States and we are working with FERC in developing a pump structure.

MR. MOORE: So you don't have a pattern for that yet the history. In the investment side of things, public private monies on a project like this one here, what percentage is public money, what percentage is private money?

MR. EBERHARDT: So currently there are no investment tax credits or production tax credits associated with storage technology and for hydro storage technology which is what we are showing here so there are no public monies available.

MR. MOORE: So you are not getting any subsidy at all?

MR. EBERHARDT: At this time there are no subsidies available.

MR. MOORE: Well that's good to hear.

MR. EBERHARDT: It's all private money.

MR. MOORE: Well that's what I was concerned about because until you get into your solar and those are mostly

public monies.

MR. EBERHARDT: Which I think going back to your question about the economic value that's very important for us because it is 100% private money going into this project we want to make sure that eventually when the market develops for it that it pencils out and this is economically a feasible project for whoever that ultimate owner and operator is going to be. Whether that is us or whether that is a utility.

MR. MOORE: Now we have five other potential pump storage facilities in this area. Are you looking at any of those?

MR. EBERHARDT: Good question so even though this project is our first foray we acquired this development from a developer who had started it back in 2009 so we have been into the project for about 3 and years and stepping into a new market here in the U.S. our initial task was to sit down and review several others projects -- pump storage projects to determine which ones were the best and understand which ones we wanted to be involved with.

Clearly since this is the one that we are involved with we thought this was the most feasible and the highest quality -- I still think that's the case today.

MR. MOORE: We have three more in this county and a couple in Wade County that are smaller.

MR. EBERHARDT: I do believe that more than one pump storage project will get built in the west there is probably enough of a market for probably three to four in the next 20 years and we look forward to trying to find opportunities to partner with the other developers who are leading those projects to create more of a portfolio of hydro for us so we are not just a one project company.

MR. MOORE: Yeah because I am not familiar with how many we have on the west. I know we have a couple that would be qualified for that in California they have the Helm's Project and I think are available to state them, they can reverse and pump back and forth for the Rice waters and all that.

MR. EBERHARDT: So existing pump storage projects I believe there is about 6.

MR. MOORE: There are about 6 on the West Coast.

MR. EBERHARDT: 6 or 7 along the western states, mostly in California.

MR. MOORE: Yeah, Helms is the one I was familiar with mostly we had that with Diablo so. I think you have answered that and your net costs you -- I don't know have you modeled that out yet on what you are looking at on this type of project, it has to be making money for you wouldn't it, and it is all private money so that's even more involved.

MR. EBERHARDT: So making money is an interesting concept with what I call a capacity project. So there are two types of projects in the utilities base work providing electricity to the market. One is an energy project and that means it pretty much runs 24/7 or most of the hours right, this can be a run-over for hydro dams, it can be a coal facility. They run, you can dispatch them they can provide energy whenever you turn them on and not when you turn them off, those are energy projects.

The other class of projects are capacity projects. So capacity projects are ones that you probably don't use quite as often as 24/7 so it is a peaking dispatch plan so you turn it on for 4 hours a day or 6 hours a day to provide peak energy to the grid right when it is needed and it is turned off the rest of the time.

MR. MOORE: I kind of picture that's where you are.

MR. EBERHARDT: We fit into that category because we have got to pump water up before we can actually generate the electricity so we are a capacity project. If you take 9 and hours to pump water up, we are not supplying electricity to the grid during that time frame.

Then we turn around and provide 9 hours back.

MR. MOORE: That's powered in and that's probably going to be coming from the north anyway on the hydro.

MR. EBERHARDT: This is a capacity project and so the energy economics are a bit different than energy projects.

MR. MOORE: I think I probably talked enough on this part here and we are getting back to the FERC's people. I would like to talk a little bit more to you.

MR. WINCHELL: Is there anybody else? I would like to really make sure before anybody leaves for lunch that we have got everybody who wants to speak today so please we have got plenty of time still.

MR. HOMOLKA: I'm Ken Homolka, that's H-o-m-o-l-k-a hydro-power program leader for the Oregon Department of Fish and Wildlife. And we plan on filing written comments that will be much more detailed than what I have to say now but I just wanted to touch on a couple of high level observations from the scoping document.

And in the proposed project facilities there's mention of a 25 inch bottom outlet that would be used as a gravitational de-watering of the lower reservoir and I think it is important maybe to identify how frequently that would be used, how much water would be discharged and where it would be discharged and whether or not the project boundary has to adopt to that area of the discharge and whether or not there is any additives to the water that need to be considered in that.

And Section 3.2.3 in the environmental measures to paraphrase it says to protect and enhance environmental resources as Sandy mentioned FERC typically uses PM&Es protection mitigation and enhancement and I suggest adding back mitigation into that section. It is really -- it is kind of an important issue especially because this is a new project -- baseline conditions are no project and there will be habitat -- terrestrial habitat that will be converted to well it would be inundated and lost for the period of the entire project and that would need to be mitigated.

And 4.1.3 in the temporal scope the scoping documents suggest 30 to 50 years because that is the potential term of an original license. I think in the Federal Power Act the original license is up to 50 years with no minimum and it is a new license it has a minimum of 30 not to exceed 50 years so we suggest -- well actually based on our experience in Oregon we fully expect a 50 year license for this project and I think the scoping document should look out 50 years.

And Section 4.2.2 water resources -- there's one bullet that says effects of project operation on water quality in the two project reservoirs, that may be a good place to consider that drainage belt situation as far as water quality and any effects it may have in the environment outside of the closed loop system.

And last comment Joe you mentioned that the reservoirs surface area was about 125 acres, that's cumulative for both correct? Not just each?

MR. EBERHARDT: I believe that's for each I could be wrong. 64 -- it's 120 split between the two. I have to consult back with the engineering design on that to confirm.

MR. HOMOLKA: Okay and well thank you I think it is in the scoping document but that's all I have for now and thank you we will have more detailed comments coming.

MR. EBERHARDT: I can make a quick follow-up on the de-watering. The de-watering is an alternative to removing water from one of the reservoirs when it needs to be periodically inspected. The primary method by which we will de-water a reservoir is to move all of the water to the other reservoir so the de-watering pipe that you are referring to is an alternative or a back-up in case there is something wrong with the penstock that will require us maybe to during some type of an emergency to de-water that particular reservoir where we could not move the water to the other reservoir.

MR. HOMOLKA: Okay I think the comment is about refilling in the case that we drain some water out of the system that's not you know related to the evaporation so not the standard annual refilling but in the case you do your maintenance, de-water your system or some of that water what

is the procedure for refilling that as far as related to the water right. I mean do you have permission to use that water right to do the initial fill and for the evaporation in this case, how does that scenario work?

MR. EBERHARDT: So we will have the water right to use the water for the energy production purpose in whatever manner is needed. We are going to start out with 420 acre feet of extra water in the project so we will always be carrying one year forward so to the extent we have a hiccup where we need to de-water some and we also simultaneously have these maximum expected evaporation activities it is unlikely that we would lose the 420 that's stored in there plus the additional rights to draw another 420 within a one year period.

So we have quite a buffer in that regard but the 420 is kind of your expected high case scenario so if you do have a more evaporative year -- I wouldn't call it a drought, windy year, whatever the reasons are that is increasing the evaporation then that will put us higher toward the 420 cap that we have. We are capped at 420 so we would have to manage possibly if we do hit that cap of less water in our operating system until we get to the next year.

MR. HOMOLKA: Okay thank you.

MR. WINCHELL: Anyone else? This is your time to speak up. Okay just a few little quick closing remarks --

do not forget this deadline of September 9th for comments involving this scoping process, scoping document 1. And again as Karen was saying you can file them, e-file them or you can file them regular snail mail and of course the comments today are already recorded from our stenographer.

But again September 9th is the deadline to get these comments in based on scoping document 1. Okay well I don't think there's anything else to go through. I think we are done for this morning and again I really thank everybody to come out and show up and get involved with this project it is very, very good.

Okay thank you and we are adjourned.

(Whereupon the meeting was adjourned at 10:51 a.m.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceeding before the FEDERAL ENERGY REGULATORY COMMISSION in the Matter of:

Name of Proceeding:

SWAN LAKE NORTH PUMPED STORAGE PROJECT

Docket No.: P-13318

Place: KLAMATH FALLS, OR

Date: AUGUST 10, 2016

were held as herein appears, and that this is the original transcript thereof for the file of the Federal Energy Regulatory Commission, and is a full correct transcription of the proceedings.

Gaynell Catherine

Official Reporter