STATE OF MAINE

MAINE BOARD OF ENVIRONMENTAL PROTECTION
AND
DEPARTMENT OF ENVIRONMENTAL PROTECTION

IN THE MATTER OF
NORDIC AQUAFARMS, INC.

APPLICATIONS FOR ATLANTIC SALMON LAND-BASED AQUACULTURE FACILITY

HEARING - DAY 1
TUESDAY, FEBRUARY 11, 2020

PRESIDING OFFICER: ROBERT DUCHESNE

Reported by Robin J. Dostie, a Notary Public and court reporter in and for the State of Maine, on February 11, 2020, at the University of Maine Hutchinson Center, 80 Belmont Avenue, Belfast, Maine, commencing at 9:00 a.m.

BOARD MEMBERS PRESENT:
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SUSAN LESSARD
JAMES PARKER
STEVEN PELLETIER
ROBERT SANFORD

DEP & STAFF PRESENT:
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PEGGY BENSINGER, OFFICE OF THE MAINE ATTORNEY GENERAL
KEVIN MARTIN, OFFICE OF THE COMMISSIONER
BETH CALLAHAN, BUREAU OF LAND RESOURCES
DAWN HALLOWELL, BUREAU OF LAND RESOURCES
JOHN HOPECK, BUREAU OF WATER QUALITY
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INDEX PAGE

	PAGE
OPENING STATEMENT	
Nordic:	
Edward Cotter	20
Erik Heim	24
Exam By:	
Mr. Pelletier	30
Ms. Tourangeau	34
Brenda Chandler	34
Examination By:	
Ms. Racine	39
Mr. Reichard	51
Ms. Lessard	59,64
Mr. Draper	61
Mr. Sanford	62
Mr. Martin	65
Mr. Duchesne	67
Ms. Bertocci	69
Ms. Tourangeau	72
Upstream Watch:	
Ms. Racine	74,93
Martha Reeve	80
Examination By:	
Ms. Tourangeau	84,93
Ms. Daniels	87

INDEX PAGE

	PAGE
Lawrence Reichard	96,100
Examination By:	
Ms. Tourangeau	103
Mr. Martin	105
WATER USAGE PANEL	
Nordic:	
Edward Cotter	107,122
Michael Mobile	109
Thomas Neilson	114
Examination By:	
Mr. Reichard	124
Ms. Racine	134
Ms. Daniels	159
Mr. Draper	169
Mr. Martin	170
Mr. Hopeck	181,242
Mr. Parker	197
Mr. Sanford	203,220
Ms. Lessard	205,220
Mr. Pelletier	210
Mr. Livesay	215
Ms. Bensinger	224
Ms. Bertocci	232
Mr. Duchesne	232,252

INDEX PAGE

	PAGE
Upstream:	
Frederick Johnson	255
Examination By:	
Ms. Tourangeau	275
Mr. Martin	269
Mr. Duchesne	269
Ms. Racine	270
Ms. Daniels	271
Mr. Parker	274
Lawrence Reichard	279
Examination By:	
Ms. Tourangeau	287

TRANSCRIPT OF PROCEEDINGS

MR. DUCHESNE: Good morning. I now call to order this public hearing of the Maine Board of Environmental Protection on the applications by Nordic Aquafarms, Inc. for an Atlantic salmon land-based aquaculture facility proposed to be located in Belfast and Northport. This hearing is to gather evidence to evaluate the applications submitted by Nordic Aquafarms pursuant to the Department's requirements under the Natural Resources Protection Act, the Site Location of Development Act, the Protection and Improvement of Air Laws and the State's water Pollution Control Laws and rules.

Nordic's proposed project would be located on approximately 54-acres in Belfast. It would utilize salt water from Belfast Bay and fresh water from groundwater, the Belfast Water District and Belfast Reservoir Number 1 to raise and process up to approximately 33,000 metric tons per year of Atlantic salmon. In addition to a smolt building, grow-out modules, fish processing facility, gate house and visitor's center, the facility would include water intake pipes, a waste discharge pipe and a water treatment plant. At full build-out, the facility would discharge approximately 7.7 million gallons per

day of treated wastewater to Belfast Bay.

While Nordic's applications will ultimately be judged on whether it has demonstrated that all of the criteria of the DEP laws under which it has applied for permits, this hearing will focus on the following criteria and issues; under the -- number one, under the Natural Resources Protection Act and the Site Location of Development Act, which we call the Site Law, the hearing will focus on the evidence on financial capacity; water usage; impacts to wetlands, including streams, freshwater, wetlands and coastal wetlands; stormwater and erosion and sedimentation control; potential impacts to existing neighboring uses; and blasting and odor. Number two, the hearing will also focus on the evidence on Nordic's Air Emissions license application. Number three, and lastly, we will hear evidence on Nordic's application for a Waste Discharge license, including composition and characteristics of the proposed effluent; modeling of the waste discharge to Belfast Bay; potential impacts of the waste discharge on water quality, fisheries and other marine resources and other uses of the bay.

In the overall process, the DEP will evaluate whether Nordic has demonstrated that its

proposed project meets the remaining licensing criteria and comments and evidence on those criteria may be submitted to the DEP in writing until the close of the record. Handouts describing the review criteria that are being addressed at this week's hearing are available on the table in the back of the room.

My name is Robert Duchesne. I am a member of the Board of Environmental Protection and I am the Presiding Officer for this hearing. Other members of the Board here today are Mark Draper, Susan Lessard, James Parker, Steven Pelletier and Robert Sanford.

Other persons in attendance are Jerry Reid, Commissioner of the Department; Peggy Bensinger, Assistant Attorney General and Counsel to the Board; Cynthia Bertocci, Board Executive Analyst; Ruth Ann Burke, Board Administrative Assistant. Department staff, Nick Livesay, Director of the Land Bureau; and Dawn Hallowell; Beth Callahan with the Land Bureau, Coordinator Program Manager for this; and Kevin Martin from the Office of the Commissioner.

This public hearing is being recorded and it will be transcribed. Copies of the transcript will be available upon request once the transcript is completed. Our court reporter is Dostie Reporting

Service and sitting up with us today is Robin Dostie. Prior to presenting the summary of your direct testimony or cross-examining a witness, please state your name clearly and who you are affiliated with and which intervenor group you represent.

This week the audio of this entire proceeding will be live-streamed.

David Madore is the Department's Communications Director. I believe he is in the back of the room just in case any media needs to contact him for any reason whatsoever.

At this time, please silence all of your electronic devices, including cell phones, so there will be no interruptions. This is for two purposes, to maintain order and to silence cell phones.

There are emergency exits to this room. Please do not block doorways. Please note where the exits are. The restrooms are located just outside the main doorway there.

This hearing is being held pursuant to the Maine Administrative Procedure Act, Title 5, Sections 9051-9064 and Chapter 3 of the Department's Rules Governing the Conduct of Licensing.

Notice of this hearing was published three times in each of the following newspapers, the Bangor

Daily News, the Republican Journal, the Camden Herald and the Courier Gazette.

Notice was also sent to the parties, as well as those persons and/or entities required under Chapter 3 and all those who specifically requested notification, which would be the interested persons list.

During the daytime portion of this hearing, the Department will receive evidence from the applicant and the intervenors. Intervenors in this proceeding are Upstream Watch and Northport Village Corporation, Jeffrey Mabee and Judith Grace and Lobstering Representatives, Gulf of Maine Research Institute, University of New England, The Fish Are Okay, Lawrence Reichard, Eleanor Daniels and Donna Broderick.

Testimony of the parties was filed in writing in advance of the public hearing. That pre-filed testimony is part of the record and all parties have received copies.

The applicant and each intervenor group will have an opportunity to make an opening statement prior to the presentation of their first witness.

Today's hearing will begin with an overview of the proposed project from the applicant. The

applicant will then make its opening statement. We will then move to a summary of the testimony of the applicant's first witness panel. Cross-examination then will follow that. As you will see throughout this hearing, many witnesses have been grouped into panels to allow for efficiency of the hearing. Please note that Board members, counsel to the Board and Board staff may ask questions at any time, although the Board and staff will generally hold their questions until the completion of cross-examination.

A copy of the hearing schedule is located on the table in the back of the room. Times are approximate and the Board may move to take more or less time on any given topic based upon length of cross-examination and questioning of witnesses.

If there are any members of the public here today that would like to ask a question of a witness, something you believe has not been covered, you must submit your question in writing to me. Paper is available on the side table for this purpose. I will review the question, make a determination as to its relevance and ask the question as time permits. I will stress that last part. If I don't ask a question, it's no insult to the questioner how

quality it may have been, it may be part of the time management that's going to be necessary to accomplish our mission for this hearing.

The Board will hear testimony from the general public starting at 6:00 p.m. this evening.

All witnesses at this hearing will be sworn. The applications and pre-filed testimony will be available during the course of the public hearing for inspection by anyone who wishes to do so. Please speak with a representative of the Department if you wish to look at portions of the file. After the hearing, the project file will be available for public review by arrangement during regular business hours at the Department's Augusta Office. The project file is also available online at maine.gov/dep/projects.html.

At this time, I ask all persons planning to testify today to stand and raise their right hand. Do you swear or affirm that the testimony you are about to give is the whole truth and nothing but the truth?

(Witnesses affirm.)

MR. DUCHESNE: Thank you. All participants in the public hearing are expected to conduct themselves with courtesy and professionalism, both in

their dealings with the Board and with each other and with the general public throughout the proceedings. Cheering, booing and clapping are not permitted. If a party or a member of the general public is unable to conduct themselves professionally, I will take appropriate action, which may include excluding the individual from further participation in these proceedings.

In closing, the goal is a fair and productive public hearing. Please be aware of time constraints and adhere to the time allotted to you. Please be concise and keep testimony relevant to the hearing criteria set forth in the Board's Procedural Orders.

Board members and staff have read the pre-filed testimony. We are here to listen to and consider all the evidence. The purpose of this public hearing is to collect information as part of the license application process, for the Board to be able to, based upon the administrative record as a whole, make an informed decision based on the facts and statutory requirements. So I do thank you for your participation.

Before we get started, we have three matters that we need to address onto the record. The first

matter involves a PowerPoint presentation submitted at 3:47 yesterday afternoon by counsel for Mabee, Grace and the Lobstering Representatives for use by Paul Bernacki consisting of approximately 50 slides. The PowerPoint presentation may not be shown. In more than one pre-hearing conference in the Procedural Orders the parties were advised that all exhibits must be pre-filed with their testimony. Section 5C of the Board's Eighth Procedural Order states that exhibits may be enlarged for presentation purposes but must not otherwise be altered. In this case, there are a number of slides in the proposed PowerPoint presentation that do not comply with these directives. A number of slides in the proposed PowerPoint presentation do not comply and they appear to be new exhibits. In addition, a number of the slides in the PowerPoint presentation are excerpts from exhibits there are both authored and unlabeled. The requirements for demonstrative exhibits were discussed with the parties in more details at the most recent pre-taping -- pre-hearing conference in which Mabee-Grace and Lobstering Representatives did not participate. Given that Mr. Bernacki is not scheduled to testify until Wednesday afternoon, he may submit a different PowerPoint presentation by

close of business today for the Board's consideration Wednesday morning. Any new PowerPoint presentation must consist solely of pre-filed exhibits that are clearly identified by exhibit number and fully presented in an unaltered way. Excerpts from the applicable statutes and regulations may be included. So we are trying to give some leeway here to Mr. Bernacki to augment his presentation with those slides as appropriate.

The second matter involves an email at 4:02 yesterday afternoon by Attorney Tucker on behalf of the entity called The Friends of Harriet L. Hartley Conservation Area. This request made on the eve of this hearing it is denied. The deadline for intervention for this meeting was on or about July 12, 2019. While the Board has discretion to consider and allow invention after that date this entity has not established good cause to allow intervention in these proceedings at this late date.

And lastly, Ms. Daniels requested occasional questions and Ms. Daniels as one of our intervenors has not to this date asked for any time, presented any pre-filed testimony but wants to reserve the right to be able to ask questions during the proceeding. The Board found originally when agreeing

to make her an intervener that she had a particularized interest, was an abutter and still retains that status so we think it's appropriate and I, as Presiding Officer, believe it's appropriate that questions as time permits are certainly within the scope of her being an intervenor in this matter, so I will permit questions as time will allow and we will allow those occasional questions.

With that, the proceedings has started beginning with an overview of the project. And I remind everybody once again to silence your cell phones and anything that makes noise. Thank you.

EDWARD COTTER: Good morning. I have one exhibit to put up on the presentation if that's all right on the slide show.

MS. BENSINGER: While he's doing that, I'll mention that Ms. Burke is going to be running a clock on witnesses; is that correct? Our time keeper?

MS. BURKE: Yes.

MS. BENSINGER: Yes. And we will notify witnesses when their time has elapsed and we ask that you wrap up pretty quickly. I think there will be a -- is there going to be a little sound at the end of the time?

MS. BURKE: Yes.

MS. BENSINGER: Yes. Thank you.

EDWARD COTTER: Good morning, Presiding Officer Duchesne, Board Members, Commissioner Reid, staff members and guests. I am honored to be able to kick-off the testimony at these proceedings. Thank you for the opportunity to present our applications for your consideration.

My name is Edward Cotter. I have a Bachelor's Degree from the University of Rhode Island in Ocean Engineering. I have -- I have over 20 years of experience in project design, planning, permitting of institutional and commercial projects and large infrastructure. I have participated in the planning and management of nearly $1 million in projects. Currently, I fulfill the role of Senior Vice President of Projects East Coast Nordic Aquafarms.

Nordic Aquafarms Belfast project proposed for a site on the southern end of Belfast west of Route 1, as seen here in Exhibit 1, just north of the Belfast Water District and north of the Belfast water District Reservoir Number 1. The proposed facility is designed to provide significant portions of the northeast supply of fresh salmon reducing the need for airfreighted product.

As you can see on Exhibit 1 on the screen,

I've got a site plan presenting the overall project that I'd like to run through to provide key elements of the project. Access to the site is provided at the -- on the bottom right-hand corner at Route 1 at the existing Belfast Water District driveway. The existing water district includes approximately 14 acres of shoreland zoning -- shoreland zone that will be transferred to the city and kept as undeveloped land as resource protection and buffering. It includes an existing walkway to remain along with parking. This is shoreland zone along the northern edge of Belfast Water District Reservoir Number 1, also referred to as Lower Reservoir. That is a 250 foot shoreland zone.

There are 10 buildings identified on our site plans and I'll go through each one briefly. This should give you an idea of the intent for each building. Building Number 1 and Building Number 2 are very similar and are identical in purpose. They are grow-out modules for adult fish for approximately 12 months of the 24 months -- 22 to 24 months of the fish life cycle that will be in this building growing to full market size. Building Number 3 is called our smolt building. This is where the hatchery will be. This is where the egg quarantine will be. We propose

to grow the salmon for the first 10 or so months here until they get big enough to go into the full tanks. Building Number 4 is our processing building. This is where the final product will be crated and shipped from the facility. Building Number 5 is our central utility plant that includes emergency generation, water chilling, other typical mechanicals. Building Number 6 is our oxygen generation pad. We plan to generate oxygen here not only to use liquid oxygen, but in order to reduce shipments of liquid O2 we will be generating oxygen and creating it there. Building Number 7 is an administration as well as storage and maintenance building. Building Number 8 is our wastewater treatment plant or I should say our water treatment plant, both incoming water and wastewater. Building Number 9 is a very small gate house, about 100 square feet. 100 -- I think almost 200 square feet. And Building Number 10 is the existing Belfast Water District building, which I think if anybody has seen pictures of the site you're familiar with it. It's the red brick building that's existing. And that's proposed to be used as a information center and visitor center for the site.

Nordic proposes to build this site in two phases. Phase 1 will include portions of Building 3

to get started. It will include Building Number 1 and it will include all of the utility and central requirements such as the central utility plant, the processing, the oxygen, the switch yard and the water treatment plant.

Nordic Aquafarms submitted in May of 2019 applications for permits under the following regulations; Site Location of Development Act, Natural Resource Protection Act, Chapter 115 Minor Source Pollution License and Maine Pollution Discharge Elimination and Waste Discharge license.

These applications include the proposed use of generators for emergency back-up in order to provide reliable power at all times to maintain the water quality and filtration processes, significant wastewater treatment infrastructure beyond any other facility in the industry including the removal of nutrients not currently regulated is included in our applications. Other permits for this project include the City of Belfast Planning Board review, which is ongoing; the Maine Department of Agriculture, Conservation and Forestry; Bureau of Parks and Land, Submerged Lands Lease; Maine DACF, DMR Aquaculture license and the Army Corps Sections 10, Rivers and Harbors and 401 Clean Harbors -- Clean Water Act.

Thank you again for the opportunity to introduce this project and I look forward to answering any questions.

MR. DUCHESNE: Are there any questions in the opening remarks from the Board? For staff? Seeing none, we can proceed.

EDWARD COTTER: Thank you.

MR. DUCHESNE: Those not following along, this is the Nordic opening statement --

MS. TOURANGEAU: I'm sorry, both Ed and Eric are doing the opening statement and then I will -- for the project overview and then I will do the opening statement. Yup.

MR. DUCHESNE: Great. Thank you very much.

MS. TOURANGEAU: Yeah, sorry.

ERIK HEIM: Okay. Can you hear me? Yes. Good morning. My name is Erik Heim. I am the founder of Nordic Aquafarms and the President of North American operations and I have been Chairman of most of our subsidiaries in the company through the years.

So what I wanted to do after you got a brief product -- project introduction is just give a little bit of brief context who we are. And it's been about two years now since we announced in Maine the site of

the project after being welcomed by the city council, mayor and city manager to Belfast. And I guess we can say that we are a few million dollars poorer and a few thousand pages richer after these two years. It's been a large collaborative effort between our company and vendors in Maine and here we are.

As we all understand, what we are talking about is producing fish indoors in a protected environment and land-based, as we call it, is not new. If you look across America wild salmon populations have been sustained by land-based systems for many, many years on both coast lines, but what has happened in recent years is that the industry has been moving to also develop production for harvest size fish and that's what we are proposing here in this project.

So I stumbled into the industry here about 10 years ago and it's -- we've seen a tremendous development around this industry. I worked both on our projects and also external projects in this -- in a time line. And this all really started out with me as the first employee in 2013 and 2014. Today we are 60 people across seven offices across three countries, so we've come a long way. We are past the start-up phase and we are not quite yet a global

corporation, I would say somewhere along the way. And I -- what we are unique on is that we are one of two companies internationally that currently has a production capacity beyond 25,000 -- 2,500 metric tons of production. There is one other company that has reached that stage and that's a company called Atlantic Sapphire developing an even larger farm in Florida as we speak and they can farm -- the fish are good size in that farm already. So this is what we've been seeing is basically a number of players now scaling up.

So why are we here really? An interesting context is that the Food and Agriculture Organization and other leading institutions have pointed to the need to double the supply of seafood in the next two to three decades. In the U.S., predicted consumption of salmon this year is 600,000 metric tons. By 2030 it's predicted to be a million tons. This project is proposing 33,000 metric tons. Over 50 percent of the fish we consume is farmed today and given that the wild catch industry is not growing in volume all of the growth we're going to be seeing is coming from farming of fish. An additional dimension to that is climate change and warming oceans, which is a serious threat to the global ocean economy and we are already

seeing impacts on both U.S. coastlines for this. So this company was founded on the vision of first of all creating low impact systems for food production by also creating systems that are resilient to climate change and warming oceans.

And so we ended up in Maine after a long search. We see the opportunity to create a diverse seafood industry in Maine. It has a proud heritage of seafood and what we are looking to do is to contribute to diversify that. And I guess a question is why Maine? One of the things we saw is proximity to large consumer markets. Our strategy is to be close to the consumer. So we have 50 million consumers within one day's transport from the state. Maine has cold and clean water resources, which is critical for this type of production. And Maine has a number of strong academic institutions with strong marine science competencies, which is a great asset in the state. And finally, there is a regulatory system in Maine with experience with aquaculture. In my view, that's a key success factor for creating a best in class industry in the future.

So a couple comments about success in the segment. This is an emerging industry. I spent my first years debating the net pen industry in Norway

about the land-based farming. They did not want land-based farming in their backyard. It was a threat to the industry in Norway. We won and moved forward. Key conditions for success in this segment are capabilities and experience. That's one of the reasons we have invested in people in this company from the very, very beginning. Secondarily is scale. The whole industry is scaling up. That is the condition for sustainable business. And finally, a key point is capital strength and you're going to be hearing about that in -- from my colleague, Brenda, in a few minutes. We are a company -- our company is lucky enough to be founded in Norway, which has the largest stock exchange for salmon in the world.

Finally, the question is why Nordic Aquafarms? So we are what we call a production development company. That means our expertise is in designing and operating these facilities. Local expertise is always something we pull on in these projects as we move to new locations as we have done here. And we are currently the only company in the world operating three farms today in this specialized segment. We are the only company that is located on the west coast of the U.S. We were the first to announce in Maine that we were the first company to

build a large commercial scale facility in Norway and we operate and are majority owners in the largest yellowtail kingfish facility in the world in Denmark. So those are some of the accomplishments we have behind this. Also, we have received competitive environmental grants from the European Union, from the Danish government and from the Norwegian government. All of this has made us able to work with scientific institutions and furthering expertise and R&D in this area and it's really the sum of all of these things that we are leveraging as we come to Maine.

As for our track record, we have no major incidents in our track record, no major disease outbreaks, no escapes and that is a track record we are also leveraging as we come into Maine. And in the end, all that matters is what you produce, so today we are selling quality product across all of Europe. We brought the product twice here to New England, so many hundred people have tasted it. It's an awesome product. And that's also what we are set to do here in Maine.

Today, I'm going to close with just saying that we have today 10 staff in the U.S. for a single permit and that's because we invest in people. And

we have staff even from Denmark here today to participate in these proceedings. So we are looking forward to presenting a project we're excited about. I'm proud of the team that we've built in the last year-and-a-half here in the U.S. And right now, we are ready to really move into the financial piece, I believe, or Joanna to give the overview of the project. So thank you.

MR. DUCHESNE: Real quick, are there any questions from Board or staff? Yes, Mr. Pelletier.

MR. PELLETIER: Thanks. You've had the opportunity to -- my understanding is you've got three farms right now in Norway, but how do those compare, the land-based farms, how do those compare to what's being proposed here, you know, in terms of technologies, in terms of overall size, the amount of product that's being developed?

ERIK HEIM: Sure. So we probably have five or six years of track record now. As in any emerging industry, we have been going through a rapid learning curve. We've seen improvements as we got into production and developed those. We've made mistakes and learned from those and we really scaled our knowledge base based upon all of these things. So we have -- if you look at the capacity today the Phase 1

in Maine has about four times the current capacity we have compared to what other companies are doing that ratio is pretty low in terms of scaling ratio. So all our experience in terms of design, production and experience is really gone into the whole process of designing the Maine facility and that's what we're reaching here. In terms of what you're seeing in discharge, we've increased the standards significantly compared to the Nordic's and that -- and much of the rest of the industry and that's because much of our vision has been built on the environmental type of productions. I don't know if there is anything else you were hoping for.

MR. PELLETIER: I think we have plenty of time, so.

MR. DUCHESNE: Thank you. Seeing no more questions, we can go to the opening statement from Ms. Tourangeau.

MS. TOURANGEAU: Good morning, Presiding Officer Duchesne, Board members, Commissioner Reid, Department staff, Board staff. I am so excited to be here. It is so wonderful to be able to have this day finally here where we can sit down and the Nordic team can present this amazing project to the Board face-to-face.

Now, I know aquaculture. What's amazing about that? We're Mainers. Aren't we all lumberjacks or lobstermen? I mean, I'm an island girl from Downeast Maine. I was baiting traps before I was knee high to a grasshopper as my dad would say. Mainers know aquaculture. It's nothing new and amazing. We've been doing it for centuries.

It's our way of life, so what's all the fuss about with this project? 33,000 metric tons of salmon out of the water, it's a little different. State-of-the-art science and technology fused together to allow Nordic to farm wholesome, traceable Maine salmon on land. That's why we're here, take the fish out of the water and a whole host of environmental regulations apply that otherwise wouldn't. We know how to regulate construction and building. We've been doing that with our environmental standards for decades now, so now we're at the crux of it; the Site Location of Development Act, or SLODA, compliance with which here today and over the next three days we'll look at odor, blasting and storm water; the Natural Resources Protection Act, or NRPA, which will look at impacts to wetlands and water use; the Maine Pollutant Discharge Elimination System and Waste Discharge license, which

I'm just going to call MEPDES because I always say that wrong, which will look at the discharge to the bay and how it's being treated; and Chapter 115 Minor New Source Air licensure, which will look at the generators that the facility has for power outages in winter and for peak shaving on those August afternoons when our Bostonian neighbors are setting their AC to arctic blast. We will go through each of these hearing topics and in each over and over and over you will hear that Nordic selected a technology, an operational option or a mechanism that doesn't just meet the requirements of SLODA, NRPA, MEPDES and the air licensing rules. Instead, they've set a high bar for environmental stewardship. Every single substantive criterion is met. I've read all of the testimony. No one disagrees. Instead, they ask for an even higher bar or creation of a new standard for aquaculture on land. Over the past two years I've watched Nordic respond to this pressure, the iterative process with the Department has improved the project. It's ready to set the bar very high for aquaculture in Maine on land.

Thank you so much for all of your time and patient review and work on this project. It's so appreciated and I can't wait to have you hear about

this project over the next few days. Thank you.

MR. DUCHESNE: Any questions from Board or staff? Seeing none, thank you so much. We will move to financial capacity. We're doing great, we're only seven minutes behind.

BRENDA CHANDLER: Good morning, Chairman Duchesne, Board members. I'm happy to be here as well. My name is Brenda Chandler. I am the CFO of Nordic Aquafarms, Inc. I have been with the company since March 2019. Before that, I was the Senior Director and Assistant Treasurer for Fairchild Semiconductor. And then after that acquisition to ON Semiconductor, I became responsible for ON's global real estate.

During the five years as Fairchild's Assistant Treasurer, I successfully completed two bank deals, one in 2011 and one in 2014, both for $400 million, both were oversubscribed five year senior secured facilities.

Upon permits, NAF, Inc. will fund Phase 1 for the Belfast project with a combination of equity and debt. The NAF U.S. team here will collaborate closely with the NAF AS, our Norwegian parent, in pursuit of the financing. With permits in hand, we'll market and obtain the required financing for

Phase 1. Erik mentioned that this has been basically a two year process. It was important that we get this far before we approach the market for financing. We have to have permits in hand.

So taking a step back, and Erik has basically gone over this in his role for the U.S. subsidiary and the history, but it's important to emphasize that Nordic has built up already three farms already. So -- and they're both -- and all successful today. And also we have a sister company, Nordic Aquafarms Denmark, that is a best in class design firm for aquaculture facilities.

So for your reference that material actually was also available in the testimony, but to take a step back as far as how we're structured because that's an important piece when you talk about the equity funding. So Nordic Aquafarms, Inc., the U.S. entity, is the wholly owned subsidiary of Nordic Aquafarms AS, or Norwegian parent. So when we talk about equity, equity essentially would come through that Norwegian -- that would be raised by that Norwegian parent.

So taking a look at the cost of the project. In your material the overall project is $500 million broken up into two phases, the first phase being 270

million followed about a Phase 2 of 230 million. We broke up those major phases into partitioning into smaller tranches, which were reflective of major portions of the work and as well as an indication as to the pace in which we would have funding or the necessary funding.

In our application and subsequent information provided in our financial capacity section 3.0, we not only discussed the project cost phasing but we also talked about the successful capital raising that the company has done over the last years. And also we shared several indication letters from institutions that also was demonstrating support for this project as well. But, again, any -- any per typical -- any financial arrangement you have to kind of have the authorization to do so. So we have to have the permits, if you will, in conjunction with that effort. We want to approach the market with -- and say, look, here we are, we're ready to go and -- and, you know, and sell the value of the project to them.

Now, let me also talk about our existing shareholder base. That shareholder base has also been talked about in -- in letters from Carnegie, our investment bank, where they're basically saying, hey,

Nordic Aquafarms, you have built a very strong investor base from family offices and private investment companies. And the track record has not only positioned NAF as a strong name in this international aquaculture community, but it's basically anticipating for this Maine project. They're waiting for this Maine project to basically move forward. So once again, once permits are confirmed that is the step we can take. Our proof of concept is the fact that we already run farms. We already have three operational farms today.

Stepping back for a moment on debt. Carnegie Investment Bank also in their November 1 letter assesses that such a capital structure will be a good fit with the market for direct lenders and private debt funds. Carnegie is essentially indicating that we can do a mix of debt and equity. In a letter earlier, we had just talked about -- earlier in 2019 had talked about just equity and over time were introducing the concept of debt as well. So we fully expect that there would be a mix of both.

So the other -- the other thing in our -- in addition to our existing shareholders is the market essentially waiting, there is -- there is -- for other -- other investors are waiting to enter this as

well. So not only do we have interests from our current shareholders, we have interests from additional investors as well, so. And also we're positioned in Norway with our parent company in one of the largest salmon aquaculture investment communities there is. And Erik also mentioned that it also -- the Oslo market has the largest salmon stocked market or stock exchange in the world. So it's -- it's -- we are positioned from a very good point of strength in terms of finding investors, identifying investors, identifying those direct lenders who are interested. So that's why we are confident that the equity portion of the project will be -- will be placed.

But that's not all, in addition we already mentioned we've already exceeded an $8 million investment currently in Maine from our existing shareholder base. They've already invested in us in this project. Not to mention the fact that we've already raised just over $64 million for the companies at large as well. So not only do we have the optimism of finding additional investors and identifying those investors, in fact, that work is just now beginning, we have a track record. We've done it before. So over the course of our permitting

application process you also have seen some of those letters coming in of support and an indication that -- that we would be able to finance.

Note additionally, this isn't new. Debt isn't new for us as well. We already with those current operations have debt facilities and the process for that with our projects has initially started from equity like we are already doing, then in construction we introduce a mix of debt and equity and then when we're operating we have working capital lines. This model has worked for us in our prior operations and we fully expect that for Belfast as well. And, again, just to reiterate we're not new to debt. We have that already and Belfast is going to be similar to those other projects as well.

So to conclude, once permits are received, conditional or otherwise, we will launch financing and expect to not begin Phase 1 until such financing is demonstrated. Thank you.

MR. DUCHESNE: Thank you. I believe we can go right to cross. Unless there is anything with Board or staff, we'll hold our questions until after cross. You may proceed. Maybe you need to bang it on the table a few times.

MS. RACINE: All right. Thank you. My name

is Kristin Racine and I am with the Portland-based lawfirm Curtis Thaxter and I am here on behalf of Upstream Watch and the Northport Village Corporation.

And a few questions, Miss Chandler. As I'm sure you're aware at this point, to obtain a Site Location of Development permit the applicant must demonstrate the requisite financial capacity for the project, correct?

BRENDA CHANDLER: Mmm Hmm.

MS. RACINE: That's a yes?

BRENDA CHANDLER: That's a different -- and there is also additional -- in addition to that -- you are correct. In addition to that there are also criteria that anticipates that large projects actually also have other ways to demonstrate that capacity as well.

MS. RACINE: And to that end, Nordic submitted a letter from EKF, correct, I believe that's your Appendix 3-C to your application, your SLODA application that was January 2, 2019?

BRENDA CHANDLER: That's right.

MS. RACINE: And that letter states that we are pleased to inform you that EKF supports Danish exporters including Nordic Aquafarms DK ApS and their exports around the world. With this interest --

letter of interest, EKF would like to express interest in projects with the involvement of Nordic Aquafarms DK ApS and possible participation in the financing thereof. Did I read that correctly?

BRENDA CHANDLER: Yes.

MS. RACINE: In this letter does EKF commit to provide financing to Nordic Aquafarms, Inc?

BRENDA CHANDLER: I would look at the EKF interest in the project as a tool. As you know, as you're looking at a variety of -- of opportunities as to how to get financing you actually look at a number of those types of opportunities. The reason I explained a little bit about our structure -- our legal entity structure was to talk about and introduce the fact that we have a Danish operation. That Danish operation is actually key in our design and the purchase of equipment. So early in the process we had identified EKF as -- and as you saw in the letter of interest that -- that they were interested in the fact that there could be a considerable amount of funding required in coming out of Denmark because of the Denmark legal entity for that equipment.

MS. RACINE: Sure.

BRENDA CHANDLER: And so -- and so we

included that early on, but, again, that's a tool. Um --

MS. RACINE: Just to clarify, the letter doesn't mention Nordic Aquafarms, Inc.; is that correct?

BRENDA CHANDLER: No, it does not.

MS. RACINE: Okay.

BRENDA CHANDLER: So our inter-company agreements for NAS, Inc. and the NAS DK would actually address all of that.

MS. RACINE: Okay. Thank you. And a cash equity commitment in the SLODA instructions is actually defined for you. It's called -- it's cash equity commitment to the developer sufficient to demonstrate the applicant's ability to go forward and generally the Department will consider 20 percent equity of the total cost of the development as the, quote, normal equipment; is that right?

BRENDA CHANDLER: That's right.

MS. RACINE: And Nordic submitted as evidence of a cash equity commitment and that was Appendix 3-A, I believe, where you mentioned that. Does that sound right?

BRENDA CHANDLER: I did not say that we had 20 percent.

MS. RACINE: Right. And you actually said the figure 63.6 million; is that correct?

BRENDA CHANDLER: That was cash that we raised, yes.

MS. RACINE: Okay. And the total cost I believe you mentioned at the beginning of your statement was 500 million for the project; is that correct?

BRENDA CHANDLER: That's right.

MS. RACINE: 63.6 million is 12.7 percent of 500 million; is that correct?

BRENDA CHANDLER: That's correct.

MS. RACINE: And not all of the 63.6 million equity that you've identified in this application is irrevocably committed for this Belfast project; is that correct.

BRENDA CHANDLER: That's right. So $63.4 million is what the company has raised since 2014 on all of its operations. And the reason that was included in the information was a way of demonstrating that we have built three farms, have bought the design company in Denmark and have engaged in the U.S. operations to start this permitting process. It says, and strongly, that we have the ability to raise capital and that's why that was

included.

MS. RACINE: I'm glad you raised the three companies because I wanted to ask that -- you said equity was going to provide 40 percent of the building costs for the project, approximately a $200 million figure for the equity piece?

BRENDA CHANDLER: So -- so when we are -- we actually are petitioning the entire financing between Phase 1 and Phase 2.

MS. RACINE: Right.

BRENDA CHANDLER: Right.

MS. RACINE: So the equity would provide 40 percent of the building cost but you projected cash flow from operations as predicted to provide 10 percent of the building cost --

BRENDA CHANDLER: Right.

MS. RACINE: -- or approximately $50 million dollars?

BRENDA CHANDLER: Phase 2.

MS. RACINE: Okay. Oh, so only Phase 2 that's the -- cash flow for operations is only going to be for Phase 2 not for the building cost of the project -- building cost from Phase 2?

BRENDA CHANDLER: Right.

MS. RACINE: Mr. Heim, if you know or

somebody else on the panel wants to weigh in, when are operations set to begin for the Belfast project?

ERIK HEIM: When operation -- is this working? When operations are set to begin?

MS. RACINE: Yes.

ERIK HEIM: Obviously the project cannot proceed until permits are in place, that triggers the final financing steps and based upon that we can take steps into operations. And we have a two year construction project involved in this, halfway through that we will bring in eggs to start up hatchery operations?

MS. RACINE: In the Carnegie and Pareto memo that you submitted it says that NAF expects cash flow from Norwegian operations already from 2020/2021. What's the status of the cash flow?

ERIK HEIM: I can answer. So we have cash flow in Denmark already and cash flow starts this spring in Norway.

MS. RACINE: Starts this spring, okay. Ms. Chandler, as I mentioned, in cases where funding is required that there can be no commitment of money until approvals are received, which is I believe what you've been telling us --

BRENDA CHANDLER: Mmm Hmm.

MS. RACINE: -- an applicant may submit a letter of intent to fund from their corporate funding institution; is that correct?

BRENDA CHANDLER: So when we -- I think I was pretty clear that -- that permits in-hand we will begin our financing. We've already taken steps obviously, but in earnest we would approach the market. Typically how those -- those deals actually will function is that it will be a combination at the same time equity raised and so -- and I also want to say that our -- our investment bankers who are the experts in this area would help guide us towards what that actual percentage should be at the time. We -- it really -- it depends on the appetite in the market.

MS. RACINE: Am I correct though in reading what you submitted with your application that none of the letters submitted state any amount of funds to be provided or any particular --

BRENDA CHANDLER: I've been pretty clear that we will approach the market and fine tune that and show -- and demonstrate actually the proof of that upon permits and moving forward with the process.

MS. RACINE: Mr. Cotter, the regulations

provide that in cases where there is one or more limited liability corporation as part of an applicant's corporate structure, and this does pertain to financial capacity, evidence is supposed to be submitted describing the applicant's corporate structure and demonstrating that the proposed financing is clearly linked from the financing institution to the applicant. Am I correct that you work for Nordic Aquafarms AS?

EDWARD COTTER: No, I am an employee of Nordic Aquafarms, Inc.

MS. RACINE: Your are now. Are there -- how many employees are there of Nordic Aquafarms, Inc?

EDWARD COTTER: Ten.

MS. RACINE: Ten at the moment. And what is Nordic Aquafarms Maine, LLC?

BRENDA CHANDLER: So I can answer that for you.

MS. RACINE: Okay.

BRENDA CHANDLER: So in the application you'll see a corporate structure, a legal entity structure, which showed Nordic Aquafarms AS, our Norwegian parent, then you see the U.S. corporation Nordic Aquafarms, Inc. You'll also see at the time the application was submitted a California Investment

LLC. That California Investment, LLC has since changed its name just so you know to Nordic Aquafarms California as -- that was in conjunction of our -- our kicking-off our permitting process in California and that's an LLC structure. The next step that was to -- to also create a Maine, LLC, which at the moment is not operational, we've just done the corporate work to basically set it up. So ultimately in the end not to disturb any kind of procedural application or anything like that because the application is by Nordic Aquafarms, Inc., we envision in the future to have a two LLC structure that would comprise of a fully functioning California entity under the LLC and a fully functioning Maine entity as an LLC rolling out to a U.S. holding company, which is NAF, Inc. Those are future steps to take.

MS. RACINE: So Maine, LLC will be funded?

MS. TOURANGEAU: I'm going to object to this line of questioning. I allowed for Ms. Chandler to answer the first question, but the Maine, LLC is not the permit applicant nor is it even, as she just testified, an existing operational company and it was not discussed in the testimony at all.

MS. RACINE: That's fair. I believe that there was a Secretary of State filing on January 10,

2020 for the Maine, LLC, so given that it's within the purview of --

MS. TOURANGEAU: I'm objecting again that you're testifying into the record.

MS. RACINE: Okay. I'll wait for the Presiding Officer.

MS. BENSINGER: First, just a reminder to the parties, please direct your objections to the Presiding Officer. And if you would like to respond, that's fine.

MS. RACINE: Sure. I -- I think I've asked my question. I do think it is relevant given that the regulations specifically provide for that type of corporate structure to be disclosed in the application and I understand it wasn't in the testimony, but this was a recent Secretary of State filing just last month, so I do think it's relevant if the -- if the witness knows.

MR. DUCHESNE: As you can tell, you may go ahead and answer the question.

BRENDA CHANDLER: Okay.

MR. DUCHESNE: Please restate the question.

MS. RACINE: So to restate it, will the Maine, LLC be funded?

BRENDA CHANDLER: So the -- actually, Nordic

Aquafarms, Inc. will be funded and, as you may know, LLC structures are also looked at in aggregate for federal tax purposes so as a conglomerate of essentially the sister companies, but the Nordic Aquafarms, Inc. will be the entity that's funded.

MS. RACINE: And one last question with relation to the California, LLC you mentioned. Is the plan for that to -- operation to be similarly funded the way you described for the Maine operation? In other words, will you be relying on Nordic AS to also be providing --

MS. TOURANGEAU: Objection as to relevance to the Maine project.

MR. DUCHESNE: And I would agree that that permit and that corporate structure is not really part of this proceeding.

MS. RACINE: I would just say it could be relevant in terms of all of the equity that has been put forth as available for this project is coming from the parent company and we're told that the parent company will also have this wholly owned subsidiary out in California, so I guess with respect to my question I can rephrase and just ask is the $63.6 million of equity that's been identified in your project irrevocably comitted to the Belfast

project?

MR. DUCHESNE: You may answer that question. That's better put. Thank you.

BRENDA CHANDLER: Of the -- the $63 million has monies that have been raised from the existing shareholders and -- and that's basically gone into what also has been going on for the Maine permitting process and our salaries and our earnings cost, so, you know, it's a continual actual interaction with our shareholders on functioning. They are very anxious I -- I might say they're very anxious to fund the Maine project pending permits and moving forward.

MS. RACINE: Just, if I may, the $63.6 million will not all go into the Belfast project, that is not the plan?

BRENDA CHANDLER: No. No, it won't. It can't.

MS. RACINE: That's all my questions. Thank you.

MR. DUCHESNE: Thank you very much. Cross by Reichard. Mr. Reichard.

MR. REICHARD: Thank you. Before I start, I would like to point out a couple of inaccuracies that have already been stated here today.

MS. TOURANGEAU: Objection.

MR. REICHARD: Certainly, we want to know what's going on truthfully.

MR. DUCHESNE: The objection is sustained. This is an opportunity to ask questions of the panel, to cross-examine but not to testify.

MR. REICHARD: Okay. Sounds like a cover up to me, but in any event.

MS. TOURANGEAU: Objection.

MR. DUCHESNE: And I would also recommend being cautious with language. As I stated at the beginning, we do need to show everybody respect here and respect to the proceeding and thank you very much.

MR. REICHARD: Just stating the facts.

MS. TOURANGEAU: Objection.

MR. REICHARD: Mr. Heim, does your budget include the cleaning and slaughtering of fish, entire tankfuls of fish, the largest in the world, cleaning and refilling tanks when disease, virus and bacteria break out in those tanks that are the largest in the world?

ERIK HEIM: I'm not sure I understand the scenarios you're referring to. There is --

MR. REICHARD: Okay. When there is outbreak --

ERIK HEIM: -- we don't -- we don't have any cases of that.

MR. REICHARD: Yes, but other fish farms have, have they not? Actually, if that's true then why did a former employer of yours, Mr. Bent Urup, perhaps the world's foremost aquaculture expert, tell me that there had been outbreaks in your Maximus industrial fish factory in Hanstholm, Denmark?

ERIK HEIM: That's inaccurate because we have veterinary reports stating otherwise.

MR. REICHARD: It is not inaccurate. It --

ERIK HEIM: Yes, it is.

MS. TOURANGEAU: Objection. Objection as to relevance, objection as to the scope of the testimony --

MR. REICHARD: He has stated --

MS. TOURANGEAU: -- objection as to characterizing and testifying instead of asking questions.

MR. DUCHESNE: Objection is sustained. Counsel is correct. Can you continue asking questions, please?

ERIK HEIM: I can just add to that that we have protocols for any incidents in the facility. It's part of our quality -- quality framework.

MR. REICHARD: Why would you have protocols if it never happens?

MS. TOURANGEAU: Objection. These questions are not regarding financial capability.

MR. REICHARD: Yes, they are. I am trying to establish whether they have the financial capability for dealing with these outbreaks.

MR. DUCHESNE: I believe that's different than the financial capacity of being able to put this project on the landscape and get it done.

MR. REICHARD: Is their ability to keep the project running not relevant?

MR. DUCHESNE: That is -- that part is relevant, yes.

MR. REICHARD: Well, then I -- may I proceed?

MR. DUCHESNE: You may proceed --

MR. REICHARD: Thank you.

MR. DUCHESNE: -- providing that it's relevant.

MR. REICHARD: Okay. So why would you have -- why would you have that if this -- this never happens?

MS. TOURANGEAU: Objection, clarity. Can you clarify the question?

MR. REICHARD: I think we just had the objection overruled. Why -- why would you have protocols for dealing with this if it never happens? That has been approved by the Chair.

ERIK HEIM: I'm saying we have quality protocols dealing with all kinds of preemptive measures in the facility and the main focus to prevent these incidents and that's why we never have these incidents and we are no different than any other aquaculture company when it comes to this. So we have -- that's -- that's industry standards in terms of always working preemptively to always make sure that you never end up in these situations. So far our company has never been there.

MR. REICHARD: Are you -- are you -- okay. Are you aware that Mr. Urup said that your oblong design is likely to invite bacteria formation on the long sides of your design?

MS. TOURANGEAU: Objection as to relevance of financial capability.

MR. DUCHESNE: Agreed.

MR. REICHARD: He -- he must have the financial capability --

MR. DUCHESNE: I sustained the objection.

MS. BENSINGER: Mr. Reichard, there will be

other opportunities to ask questions on those types of topics, so I just encourage you to keep your --

MR. REICHARD: Well --

MS. BENSINGER: -- questions to the financial capacity.

MR. REICHARD: -- I had been doing that.

MS. BENSINGER: Thank you.

MR. REICHARD: I believe that it's relevant that the applicant had the financial capacity to keep this project running so that the citizens of Belfast are not saddled with the cost of --

MS. TOURANGEAU: Objection to testifying.

MS. BENSINGER: Go ahead and continue asking your questions, please.

MR. REICHARD: Thank you. Continue asking my questions. Do you think that the citizens of Belfast and the State of Maine should be saddled with the cost of taking away your building should you be financially incapable of maintaining this project?

ERIK HEIM: That, I see no reason why we should have to pass another -- we are following all of the --

MR. REICHARD: Would you please answer the question?

ERIK HEIM: Yes. We are following Maine

procedures currently to permitting and that's the basis that we are basing this application on.

MR. REICHARD: Would you -- would you please answer the question?

MS. TOURANGEAU: Objection. He answered your question.

MR. REICHARD: No, hasn't. Do you think the citizens of Belfast and the State of Maine should be saddled with the cost of carting away your building should you be able to -- unable to maintain your facility?

ERIK HEIM: We do not make legislation for investments in Maine and how they are dealt with in those scenarios. We follow the --

MR. REICHARD: Please answer the question.

ERIK HEIM: I am not the right person to answer the question.

MR. REICHARD: Would you please --

MR. DUCHESNE: The witness is trying to answer the question. What we're dealing with here and the relevance of the topic is under SLODA does the business have the financial capacity to get this project going and to finance it and operate it correctly. That is where we're trying to narrow our focus and if we can constrain ourselves to that that

would be wonderful. I also agree with counsel that there is going to be opportunity to talk about some of the other things in pre-filed testimony when we get to that portion of the hearing.

MR. REICHARD: Okay. Well, let's just assume that Nordic Aquafarms is a responsible citizen as you have said repeatedly in public information meetings. If that is the case then why have you repeatedly in public information meetings declined to say that you would take out insurance so that the citizens of Maine and Belfast are not saddled with the cost of carting away your building if you are unable to maintain your operations?

ERIK HEIM: We take out many insurances. We work with a global broker in insurance, so there will be numerous insurances related to this project.

MR. REICHARD: Is it not true that you have repeatedly in public information meetings declined to say that your company will take out such a bond?

ERIK HEIM: Are you talking about bonds? Okay. When it comes to bonds, we will follow laws and rules in Maine in terms of we expect to be treated the same as any other business in Maine and we will follow those rules.

MR. REICHARD: Do you think that any other

business in Maine should be allowed to build gargantuan buildings and then walk away and leave them?

MR. DUCHESNE: That question seems to be straying outside of bounds. If we can confine ourselves to the actual application in front of us.

MR. REICHARD: I believe I'm doing that.

MR. DUCHESNE: Could you do it better?

MR. REICHARD: Well, as a citizen of Belfast, I'm quite concerned about being saddled with the cost of this.

MR. DUCHESNE: Yes, I understand that and that's why we're going to focus on whether the company has the financial ability to carry out the standards of SLODA.

MR. REICHARD: I believe that's exactly what I'm doing.

MR. DUCHESNE: Great. That's what we're trying to do.

MR. REICHARD: Okay. That is all that I have for this time.

MR. DUCHESNE: Okay. Thank you. I now go to Board and staff for any questions. Questions from the Board. Ms. Lessard.

MS. LESSARD: Thank you. You've referenced

the three farms that Nordic has already created to put -- to give this some perspective, what was the cost of the establishment of those three farms?

ERIK HEIM: Okay. They have been developed in different phases and so it's -- you might call it incremental investment project and there is two aspects to that. One is your initial capital cost and the other one is your operational cost, so you need to break that down a bit. We -- as of today, we are probably, I don't have the exact figure in front of me, but we are probably somewhere in the range of $35 to $45 million in investment costs in those projects.

MS. LESSARD: And that's the capital cost similar to the 500 million capital cost that's established for this project?

ERIK HEIM: Yeah, so we have established a total of 2,500 plus metric tons, close to 3,000, and basically what we're proposing here is to scale that up into Phase 1 to about three to four times that scale that we already have established and with Phase 1 in operation the next step will be Phase 2, so it's a step-by-step process.

MS. LESSARD: So your initial step is a little less than the half of the 33,000 metric tons

that you're looking to raise?

ERIK HEIM: Yes. It's the phased expansion.

MS. LESSARD: Yes.

ERIK HEIM: Which you will basically see any company in this segment do and it's what we've done already. We started with 1,200 metric tons then added an additional two times that in next step and next step again is Phase 1 in Maine and the next step after that is Phase 2 in Maine.

MS. LESSARD: Thank you.

MR. DUCHESNE: Other questions from Board? Yes, Mr. Draper.

MR. DRAPER: So Ms. Chandler, in your pre-filed testimony you had a chart that describes the mix of equity and debt in different phases of the project and you mentioned it denotes, you know, that carrying into initial working capital. Is there any -- do you have any projection of how long that period lasts, the need for that working capital to the point where cash flow from the operation then takes over and supports the project?

BRENDA CHANDLER: So we fully -- so during Phase 1 our operation actually will -- will come online. If you notice the configuration of the building it's basically the infrastructure is built,

the water treatment plant, the central utilities, smolt and then the grow-out facilities are modular and so we fully expect actually to put eggs in smolt prior to the completion of Phase 1, so prior to actually completing all of construction for grow-out modules. So that gives us a bit of leg up to actually start eggs to fry and fry into -- ultimately into the first of the grow-out modules. So I don't have the exact like phasing, but conceptually what I'd like for you to kind of like -- what I'm saying is that we will be getting ourselves essentially to cash flow in the end of Phase 1, which starts to step up and give us a cash flow for into Phase 2.

MR. DUCHESNE: Thank you.

MS. BENSINGER: Could you pull the microphone a little closer to you so we can make sure the people in the back of the room hear you?

MR. DUCHESNE: Other questions from the Board?

MR. SANFORD: Yes.

MR. DUCHESNE: Mr. Sanford.

MR. SANFORD: In discussing the metric tonnage can you -- is there a sustainable harvest rate associated with that? Is that total biomass? What's the range for these kinds of projects in terms

of return on investment, for example?

ERIK HEIM: Okay. So my 10 years in this industry I've worked with probably a dozen or more projects and have seen the learning curve in this industry as well. Generally what we've seen is that in the past six or seven years companies have moved up in scale. The first steps there has really been to go to 1 to 2,000 metric tons. That's when you start approaching what I would call a critical scale where you can start turning a profit. But to really move into competitive space compared to net pens, for example, which are basically consolidating a scaling as well, these farms need to scale up. So typically what you're seeing our company we're looking at this location's given infrastructure, connectivity costs and everything that goes into looking at this business case, our assessment is that we need to be at the target levels to be fully competitive in the market. Other projects like Sapphire in Florida have a target of 220,000 metric tons, so it's much, much bigger than this project. So you will see a whole scale ranging from about 10,000 metric tons up to that level in the market right now. Most of the farms being proposed are 10,000 metric tons plus will be seen in developments now. The exception might be

more niche species, for example, Kingfish Zeeland who is also looking at a project in Jonesport. The market is much smaller. It's a niche production, so they're looking for a slightly smaller scale in that type of production. Salmon is a big market. It's a volume market and that's why facilities need scale to be competitive.

MR. DUCHESNE: Other questions from the Board or staff? Yes, I'll go to Ms. Lessard first.

MR. MARTIN: You first.

MS. LESSARD: Sorry, I didn't mean to butt in.

MR. DUCHESNE: I give deference to Board members because I can.

MS. LESSARD: Okay. Thank you. So the -- the funds that are going to -- that have been discussed are equity that -- et cetera. What kind or, if any, commitments do you have from the markets for your product that would indicate its long-term viability here?

ERIK HEIM: Okay. So basically we are sold out in Europe on the production there and ready to expand. Salmon is a commodity market, so it's one of the easiest products to sell because supply is not keeping up with demand and when you look at the

growth projections in the U.S. there is a growing demand/supply gap. Our position is this, we have no benefit of trying to lock down any sales agreements at this time and so because of that dynamic our position is that we are benefiting from keeping that position open as long as possible as it is today. And as that -- as time goes when we start getting into sales mode and delivery mode in let's say three years from today, the demand/supply gap would have grown additionally in terms of what we see in domestic production. That's why we all speak saying that Maine has room for a number of farms and obviously Bucksport has a farm project planned and the U.S. domestic supply of farm salmon is tiny compared to total domestic consumption. So what we're talking about is displacing imports and creating a local supply and I think you as consumers will be more than ready for that product.

MS. LESSARD: Okay.

MR. DUCHESNE: Mr. Martin.

MR. MARTIN: Sure. So I have a couple of questions about overseas facilities and kind of their similarity to this facility. Have they received similar funding at a similar time after receiving all of the permits? Can you speak to that?

ERIK HEIM: I guess I am most of the history man. So we've had a pretty consistent shareholder group actually for the last three or four years, which have done most of the funding in Norway and Denmark. They have received most of the funding up front, but there's been a step financing from shareholders along the way. We've also made various expansions at additional facilities along the way, which they have also funded. And an additional component to that funding has been about $4 million in environmental grants in Europe that has come in addition to the core funding from shareholders.

MR. MARTIN: Did that funding come after receiving the permits?

ERIK HEIM: Yes.

MR. MARTIN: Thank you. Are there -- and this is to Ms. Chandler. Are there any other contingencies besides receipt of permit that you view will be applicable here from some of this funding?

BRENDA CHANDLER: Well, of course the overall financing package would also have -- they would have to go -- thank you. So they would have to go hand-in-hand, so both the financing and the permitting as well.

MR. MARTIN: Okay. One other question. Are

any of the overseas facilities, have they reached the operations stage in terms of how much of those projects are funded by operations similar to this project where the second phase of it is proposed to be funded by operations, have they reached that phase?

BRENDA CHANDLER: Right. Yes, they have.

MR. MARTIN: Is the ratio or the time frames similar to the project on this?

BRENDA CHANDLER: Yes, I would say so.

MR. MARTIN: And have they met a -- I guess what needed to be funded at that period of time, have they met that portion of it?

BRENDA CHANDLER: They have.

MR. MARTIN: Okay. I have one final question. You had stated at that point in pre-filed testimony that you would -- if so conditioned, you would provide evidence at each subsequent stage, is that still the applicant's position?

BRENDA CHANDLER: Yes.

MR. MARTIN: Thank you. That's my final question.

MR. DUCHESNE: Okay. Other questions from the Board or staff because I have one. I guess just to the applicant, do you have confidence that you

have sufficient understanding from DEP staff during the application process that you know what the target would be on meeting the criteria and Site Law understanding how much equity they might require to prove that you have financial capacity --

BRENDA CHANDLER: Right.

MR. DUCHESNE: -- you feel comfortable?

BRENDA CHANDLER: Yes.

MR. DUCHESNE: So if we were to grill them later on in this process they'd know what we were talking about?

BRENDA CHANDLER: Yes. So what we -- this process, as you know, has taken quite some time and through that, you know, conditions change, you know, there is basically creating more confidence, the market is responding to these types of projects even more, you can see articles coming out on other financing and actually potentially even become political as we start on these types of projects. So the first part -- just to sort of reiterate, the first parts of our submitted information was really all saying that we're going to support it predominately with equity and then as time goes on the whole debt component has entered into it. I understand that the requirements of the -- of the

application and the different conditions that are required to demonstrate and that's why -- that's for the application. That's why basically we're stepping to I believe the ordinance is 2.4(C), something along those lines where a phased construction such is that you can actually demonstrate at different increments before you actually begin that phase, so that's essentially what I essentially expect to happen is that we'll identify a road map as to how we would demonstrate that and over time comply with that.

MR. DUCHESNE: Great. Anything else from the Board or staff? Ms. Bertocci.

MS. BERTOCCI: I am looking at your pre-filed testimony and the breakdown of the different estimated development costs for Phase 1 and Phase 2 and the total cost for Phase 1 is estimated at approximately 270,000 -- excuse me, 200 -- sorry, $270 million.

BRENDA CHANDLER: Million.

MS. BERTOCCI: And at what point -- and you've got it broken out by permitting, land acquisition, site clearing, site piping, can you give us some sense of the time line under which you were planning to raise this kind -- this amount of money and at what point you would -- you would start

seeking additional financing for your project because you're stepping it up, but it's -- it's a fair amount of money to raise over --

BRENDA CHANDLER: Right.

MS. BERTOCCI: -- a three year period or something like that.

BRENDA CHANDLER: So now that we're at this juncture and fully expecting that approval or some sort of condition, what we are actually proposing to do is we're launching to seek funding for the entire project for the entire first -- first half, so the 270 million. So let me sort of -- sort of lay that a little bit out for you. The tranches were identified originally to split in sort of major sections of the project, sort of initially getting all of the ground work, earthwork, site prep completed and although many of the environmental components as well, so that's the first 22 -- 21, 22 million. The second tranche was $188 million is then we're moving into building and process equipment inside the building. And then finally, it's the third module which is -- which is basically another module adding on essentially inside the building. But so we laid that out initially with the anticipation that there would be different funding as we go. So we fully expected

that the first tranche, the first 20 million to be covered by equity and then the next -- the next two tranches to be covered with a combination of equity and debt.

Now, what does that deal look like? So when we approach the market, as I mentioned before, it would be a combination of debt and equity so there would be at that point when we're working with our investment bankers we would be approaching that market and they would help us with that breakdown as to how much debt essentially or how much -- the other way around, how much equity would be required to take on this -- this piece of debt as well. So there would be essentially that mix that we would be advised on how to -- how sensitive, if you will, that we should be offering up more and more equity or not.

ERIK HEIM: I might add that there are shareholders that are not moving forward until 100 percent of Phase 1 is financed. That's their requirement, but we expect to be subjected to fair standards along -- seen with other companies here in the U.S. -- in Maine. And the one thing that they would like some flexibility, you know, on is the exchange rate movements we're seeing, which have been very significant between Norwegian krone and U.S.

dollar and that's why we would like to have some flexibility in there to manage those kind of movements.

EDWARD COTTER: Going back to Ms. Bertocci's question, one thing that I'd like to expand on is Ms. Chandler mentioned the first tranche, which includes site clearing, excavation and environmental controls. This ties -- when it gets to your question about the schedule it ties very closely with the ES drawings and our drawings, which is site clearing and phasing and what we identify as expenses such as storm water, silt control, erosion control measures that need to be fully in place and funded prior to the next step. So you'll see that a lot of that is tied to that phase and to make sure that the site is fully controlled before we move to the next phase.

MR. DUCHESNE: Are there any other questions? Seeing none, thank you. We can proceed to our redirect and then recross. Briefly. We're doing well. We're only 15 minutes behind schedule now.

MS. TOURANGEAU: One question, so -- which I'm hoping goes to Ms. Bertocci's question. If there was a condition on financing pursuant to Chapter 373, Subpart 2, Subpart C, Subpart 2 of the Department's

rules when you would want -- what would the time line for submission of full financial capability documentation be for Phase 1 and then for Phase 2?

ERIK HEIM: Okay. So the time line, it really depends on the time line of this process obviously. So we have been working with investment banks and Nordic. There will be another one joining us soon as well, this one is Carnegie. They are basically prepared to go. So we expect probably up to two months post-permit process to be able to document financing to move forward.

MS. TOURANGEAU: So you are saying in advance of construction?

ERIK HEIM: In advance of construction. This is what our shareholders want. I think they have the same goals and concerns as anybody here in Maine. They want predictability in terms of completing what we are starting. And as for Phase 2 that becomes a little bit of a timing issue. What we want to do is to make sure we have Phase 1 up and operating and at that time it's really a Board decision when to move forward to Phase 2.

MS. TOURANGEAU: But, again, you would be comfortable with that being in advance of construction?

ERIK HEIM: Yes.

MS. TOURANGEAU: Thank you.

MR. DUCHESNE: Okay. Yes, so are there any recross on the redirect questions?

MS. RACINE: No.

MR. DUCHESNE: Thank you very much. Okay. We will take a five minute break. In the meantime, Upstream can prepare for their opening statements and we'll proceed from there.

(Break.)

MR. DUCHESNE: Looking around the table, I believe Board and staff are ready to go. All of the parties seem to be settled in, so you may proceed.

MS. RACINE: Thank you. Well, good morning again. I'm Kristin Racine with the Portland-based lawfirm Curtis Thaxter and I represent the interveners Northport Village and Upstream Watch.

Northport Village Corporation is a small municipal corporation serving the needs of Northport residents who live in that northern part -- Northport that will be affected by the wastewater discharge treatment from this proposed facility. And Upstream Watch was formed by Belfast residents near the Little River who wanted to restore that river, its historic fishway and diverse and robust bird habitat.

I want to make clear that my clients are not anti-business and they're not an anti-aquaculture. They're here today primarily for three reasons. First, they feel strongly that this site is completely unsuitable for the project. Second, they also feel like the applicant's application is fatally incomplete in many respects. And third, they feel strongly that any determination on Nordic's application will set the bar for greenfield aquaculture sites here in Maine. By contrast, it's important to know that my clients did not oppose the brownfield Whole Oceans site in Bucksport.

The applicant, Nordic Aquafarms, Inc., has proposed a project of unprecedented magnitude here in Maine to build and operate one of the largest land-based salmon farms in the United States. The project will require building, among other things, a salmon farm, a fish processing facility and water treatment plant. It covers virtually 35 acres, the size of Gillette Stadium and Fenway Park combined, but the selected site is quite unsuitable for this project. The on-site soil consists of a spongy clay-like material incapable of supporting many of the structures that the applicant proposes to build. Consequently, the applicant would need to excavate

and remove some of these natural soils possibly to a depth of 20 to 50 feet over virtually the entire 35 acre constructed portion of the site. The applicant would replace these natural soils with some sort of gravel mix that has a greater potential for supporting these proposed structures. Upstream estimates the need for about 45,000 dump truck loads to accomplish this soil replacement. Added to this fact is that virtually the entire site is an old growth forest, which would need to be destroyed and Penobscot Bay is set to receive the applicant's wastewater of -- body of water slow which is slow moving and shallow, so it's clear that this site is unsuitable for this project and was a poor choice by the applicant.

But more than that and a part -- a big part of why we're here today is it's our position that the application is fatally incomplete. Upstream Watch and NVC have tracked the applicant's submissions against the statutory and regulatory requirements. Upstream and NVC believes that the applicant has failed to address critical material requirements of the statutes and regulations and it's our position that as of now that their application cannot be granted as a matter of law.

So the applicant proposes to remove almost 45,000 dump truck loads of natural soils, remove old growth forest, install both intake and discharge pipes in the Penobscot Bay and through that discharge pipe every single day discharge 7.7 million gallons of wastewater. So we need strict adherence to the statutes and regulations of the State of Maine that this Board on behalf of the Department of Environmental Protection is charged with enforcing. Certain criteria must be met in advance of the issuance of a permit or license and this is not the time for exception or more leniency.

Over the course of this hearing we will no doubt hear assurances, as we've heard throughout this process, assurances that certain scenarios are just possibilities or unlikely to be an issue, that we can figure it out with monitoring and testing and evaluating at a later date. Once the train has left the station and the project is already well under way that's when we can figure this all out, right? Well, wrong. The State of Maine is desirable to the applicant and many others for a good reason and this application sets the bar for all future aquaculture applications in the State of Maine. If the Board insists on complete and robust compliance with

applicable statutes and regulations and if the applicant meets the high standards set by the Board then aquaculture entrepreneurs worldwide will know that Maine welcomes aquaculture but aquaculture done right.

Should the Board allow this application to default to some lower standards the result will be lower quality aquaculture facilities constructed by those who come to Maine in search of lax regulations and enforcement. Nordic Aquafarms is not the only one lining up to propose a project like this one. There are already others and there will be many, many more. So this is the time, the one shot, our opportunity to get it right. Thank you.

MR. DUCHESNE: Thank you very much. We can proceed to the summary from Upstream. Who is conducting that? That will be Marty Reeves. I would say in the shuffle for the senior citizens on this Board that may be small print. I would include myself in that category.

MARTHA REEVE: It's actually material that you already have --

MR. DUCHESNE: Okay.

MARTHA REEVE: -- it's just the application form from the --

MR. DUCHESNE: Terrific. Thank you. We do have that.

MS. RACINE: Yup, Form D in the SLODA application.

MR. DUCHESNE: Great. Thank you. And just to make sure, can you see everything okay, Ms. Tourangeau?

MARTHA REEVE: I think it will be clear without really...

MS. RACINE: Do you want to come look at...

MS. TOURANGEAU: Yeah, why don't I.

MARTHA REEVE: Yeah, I'm sure you're familiar with it. It's that checklist at the beginning of the application.

MS. TOURANGEAU: Can I see the other ones while I'm up here?

MARTHA REEVE: Yeah.

MS. TOURANGEAU: Okay. So these are -- this is the only exhibit you're using?

MARTHA REEVE: No, there are --

MS. RACINE: Possibly referring to the photo section.

MARTHA REEVE: Which you'll recognize is just the SLODA application.

MS. TOURANGEAU: Yup.

MR. DUCHESNE: Yup, we're good.
MARTHA REEVE: Nothing new.
MR. DUCHESNE: Thank you so much.
MS. RACINE: Great. Thank you. Okay to proceed?
MR. DUCHESNE: (Indicating yes.)
MS. RACINE: And all of the witnesses have been pre sworn; is that correct?
MR. DUCHESNE: (Indicating yes.)
MS. RACINE: Okay. Thank you. Good morning, Miss Reeve. Would you please introduce yourself to the Board and staff members and everyone here?
MARTHA REEVE: Hi. My name is Martha Reeve. I am a retired certified public accountant. I was licensed in Maine and practiced in Bangor and Belfast for over 13 years. I'm affiliated with the group Upstream Watch.
MS. RACINE: And, Miss Reeve, have you reviewed Nordic Aquafarms application material for this project specifically with regard to financial capacity?
MARTHA REEVE: Yes, I have given my background and my experience advising small businesses. I was curious to see what the financials

would look for a very expensive sophisiticated project that Nordic has proposed for Belfast.

MS. RACINE: And would you be able to walk us through your assessment of the contents of the application?

MARTHA REEVE: Yes, I can. In the SLODA application Form D the submissions checklist, which I've put up here for my reference and yours, financial capacity Nordic has checked five boxes as completed.

First, they've checked A here, estimated costs. And the costs are listed in chart -- they've submitted costs listed in chart 10 -- excuse me. They've submitted a chart and they listed cost in the chart of 10 cost categories in two phases and they gave a paragraph of explanation. There is not much detail to help assess its feasibility, but a cost estimate of sorts has been provided.

Second, there is B-1 here and it's a letter of commitment to funds. It requires a letter from the funding agencies, quote, indicating the commitment to provide a specified amount of funds and specifying how those funds will be used. There is no such letter among the application materials.

Third, 3-A is down here is a cash equity

commitment. It requires a cash equity commitment to the development, typically 20 percent of the cost of the development. Over its entire history Nordic AS has raised just over $63,600,000 for all of their business ventures and including four subsidiaries in Norway and Denmark. This is about 12.7 percent, the cost of the Belfast development. There is no commitment, even conditional, that any funds will be dedicated specifically to the Belfast project beyond funding the permitting process or that the applicant, Nordic Aquafarms, Inc., as opposed to its parent company has the ability or intent to raise funds by equity.

Fourth, is that they've checked down here is 3-B, which is the financial plan. It requires a financial plan for the remaining financing. A financial plan is expected to supply enough detail to assess the potential for success. Citing -- despite citing cash flow as a source of approximately $50 million toward Phase 2 of the project, Nordic has not provided any cash flow, nor profit and loss, nor timing projections, nor even a breakeven analysis. Projected financial statements are an essential part of corporate financial plans. Nordic has not provided a financial plan.

Fifth is 3-C down here, a letter. It requires a letter from, quote, an appropriate financial institution indicating an intention to provide financing subject to reasonable conditions of acceptance. In my opinion, Nordic has not supplied such a letter.

MS. RACINE: So, Miss Reeve, in your opinion, did Nordic supply a complete application as financial capacity?

MARTHA REEVE: No, they did not.

MS. RACINE: Did you identify any additional concerns other than the application not being complete?

MARTHA REEVE: I have concerns that the Belfast project is only one of several businesses that Nordic AS proposes to finance at this time. They might concurrently need funding for the $400 million project they propose in California. It has not been made clear what funds will be devoted to the Belfast project only.

Also, all of the financial capacity documented in Nordic's application materials applied to Nordic Aquafarms AS, a Norwegian company. There is no statement whatsoever that the applicant, Nordic, Inc., has any financial capacity. Nordic,

Inc., a Delaware corporation, will depend on its parent company and full shareholder Nordic AS for funding. If the Belfast project does not go as planned, Nordic AS can abandon this project without any recourse beyond where it's already been purposely comitted.

I'd also like to say that financial capacity is supposed to be met for permitting not before construction. Once they have permits in hand they're in a different realm and financing is intended to be demonstrated up front.

MS. RACINE: And is that your reference to the regulations which --

MARTHA REEVE: They all require this as part of the initial application not as a condition of the permit.

MS. RACINE: Thank you.

MR. DUCHESNE: We can go right to cross, please.

MS. TOURANGEAU: Good morning, Miss Reeve.

MARTHA REEVE: Good morning.

MS. TOURANGEAU: How many development projects valued in the hundreds of million dollars have you been involved with financing?

MARTHA REEVE: I'd like to say that I have

not ever worked with a company anywhere near this size, but I've helped many small business clients produce more sophisticated financial information than what has been submitted here just in order to get bank loans or counseling from the Small Business Administration. This project will have electrical usage greater than the whole city of Belfast, wastewater effluent greater than the whole city of Belfast, fresh water usage greater than the whole city of Belfast. The largest aquaculture tanks in the world full of fresh water full of potentially harmful biological materials will be just across Route 1 from the bay.

MS. TOURANGEAU: Does that go to financial capability?

MARTHA REEVE: This is financial capability.

MS. TOURANGEAU: Okay.

MARTHA REEVE: Penobscot Bay, which is a Maine icon Robert McCloskey and others, money and readily available money is essential to keep these systems running responsibly. I don't understand why this large project should be held to a lower standard than my clients are.

MS. TOURANGEAU: Are you aware that the majority of leader development projects have

conditional approvals under Chapter 373 of the Department's rules?

MARTHA REEVE: I am not aware of that. I am aware that often equity offers and debt offers are made with conditions attached.

MS. TOURANGEAU: Are you aware of Chapter 373 of the Department's rules?

MARTHA REEVE: Yes, I am. I am -- I have looked at it briefly. I can't say that I actually know the content.

MS. TOURANGEAU: Are you aware of provision 2.C(2) about phased developments?

MARTHA REEVE: I am -- I can't bring that to mind right off the top of my head.

MS. TOURANGEAU: Are you aware that it specifically contemplates conditional approvals that require submission of detailed financial assurance documentation in advance at each phase of construction?

MARTHA REEVE: I was not aware of that. I am not sure I think it's appropriate in this case.

MS. TOURANGEAU: Thank you. But you understand that it's in the rules?

MARTHA REEVE: Yes.

MS. TOURANGEAU: Thank you.

MR. DUCHESNE: Great. Do we have questions from the Board or from staff? Seeing none, thank you very much.

MARTHA REEVE: Thank you.

MR. DUCHESNE: If you can wait just for a second, Ms. Reeve.

MARTHA REEVE: Oh, sure.

MR. DUCHESNE: We do have redirect if --

MARTHA REEVE: Oh, oh, I'm sorry.

MR. DUCHESNE: -- counsel wishes to prompt you further.

MARTHA REEVE: You're not letting me off the hook yet.

MR. DUCHESNE: And Ms. Daniels is going to want to ask questions too. Great. Thank you. In fact, in fact, we will have Ms. Daniels come up first to ask her question before we get to redirect. Thank you.

MS. DANIELS: Ms. Reeve, thank you for testifying here. I am wondering, you had talked about something in Nordic's testimony regarding cash flow that would be in existence before prior to Phase 2; is that correct?

MARTHA REEVE: Yes, that's correct.

MS. DANIELS: And that was cash flow from

operations?

MARTHA REEVE: That's what they've stated in their materials.

MS. DANIELS: And I'm personally aware that Whole Oceans provided cash flow as well as a plan for the sale of their product, contracts that go out numerous years, are you aware of that in the Whole Oceans plan?

MARTHA REEVE: I am not aware of -- I have not looked at the Whole Oceans --

MS. BENSINGER: Excuse me, Ms. Reeve, could you please use the microphone.

MARTHA REEVE: Oh, yeah. I'm sorry.

MS. BENSINGER: I just want to make sure everybody can hear.

MARTHA REEVE: Okay. I'm sorry. Thank you for pointing that out. No, I have not read Whole Oceans' application in depth.

MS. DANIELS: Could you explain to me in your experience what cash flow constitutes when it's given as a -- as a number on a financial plan? What -- what are they talking about?

MARTHA REEVE: Well, cash flow is liquid cash that's available for the -- for management to use as they see fit that's somehow freed up in the

process of operations. This -- the immediate thought is that it's from profit, which in the long run it needs to be. For instance, in their application Nordic has stated that their ongoing operations will be funded by cash flow, which is typical and that implies a profit. There would have to be a profit to have long-term cash flow. There can be shorter term cash flow in that they have been funded with debt and with equity that they don't have to pay back right away, so sometimes you have use of the money even though it's not really yours so you can be showing a loss and still have cash flow. It's money that's available to be used.

MS. DANIELS: I understand.

MARTHA REEVE: But that's generally for a short time and not --

MS. DANIELS: Right.

MARTHA REEVE: -- not generated by profits.

MS. DANIELS: Would you expect in your experience that cash flow would reflect some known number in terms of sales of product and profit for product production?

MARTHA REEVE: As an accountant when I prepared cash flow statements for my clients, yes, I would have to know where the -- where the revenue is

coming from and what the expenses are in order to predict what sort of cash flow they would have available what time.

MS. DANIELS: All right. I believe I heard Mr. Heim say earlier that he feels no benefit to having any purchase agreements in place prior to starting his operations, however, that, as a business person myself, that seems a little bit unusual. Would that in your mind provide a challenge to predicting cash flow that you were counting on towards the development of Phase 2 of a project such as this if you didn't have any purchase agreements in place?

MARTHA REEVE: I would think at the very least that you would have identified specific markets that you feel are quite dependable because you need to know exactly what the market is in order to know what kind of price you expect to get for your goods.

MS. DANIELS: Yes. Yes. I am -- my understanding of financial capacity and the standards here is that you're able to demonstrate capacity, but I'm just wondering if you have some idea how you demonstrate capacity without actually having a demonstratable plan for that financing and for any kind of a demonstratable basis for estimating cash

flow towards a second phase of a phased project?

MARTHA REEVE: So it's not at all unusual for a business to -- I mean, I hope Nordic has been through this project just in deciding whether it's worth building a facility in Maine. You sit down and you predict generally on a time line exactly, exactly what your costs are going to be, exactly what your potential revenue is and there is definitely information available. As they've said, there is an active stock exchange in Norway that deals with salmon issues, so there is a lot of information available so you're definitely making predictions that are not necessarily totally reliable but at least they're your best guess and we haven't been presented with a best guess here.

MS. DANIELS: You haven't seen those predictions in this application?

MARTHA REEVE: There is not enough data here, enough detail to begin to know what their assumptions are.

MS. DANIELS: And lastly --

MR. DUCHESNE: Can we -- lastly?

MS. DANIELS: Yes.

MR. DUCHESNE: I want to make sure that I give equal time to anyone who is doing cross and I

appreciate your brevity. Thank you.

MS. DANIELS: Thank you. Lastly, there has been reference to the largest salmon stock exchange in Oslo Norway, are you aware of how the stock exchange has -- the prevalent news for nearly the past year that I've been reading in the industry newsletters have been about low price of salmon, are you aware of that?

MARTHA REEVE: I am not aware of price in particular. I am -- what I have been hearing from a number of people is that none of these facilities has shown a profit yet.

MS. DANIELS: Okay. Thank you very much. Thank you.

MR. DUCHESNE: Thank you. And I would just like to compliment you. There was nice questions to a witness who has the expertise to answer them properly, so they were pertinent, to the point and to the right person, so thank you very much.

MS. DANIELS: Thank you, Mr. Chairman.

MR. DUCHESNE: We can go to redirect.

MS. RACINE: Thank you. Very briefly. Miss Reeve, I believe you were directed to a section of the regulations regarding phased development in which it is true that the regulations provide that in cases

of phased development that the Department could find that the applicant has demonstrated adequate financial capacity to comply with the Department requirements provided that the applicant has demonstrated financial capacity for the first or separate first phase. Is it -- in your opinion, has Nordic demonstrated for any phase of the project?

MARTHA REEVE: No, they have not.

MS. RACINE: And -- no further questions.

MARTHA REEVE: Thank you for clarifying that section.

MR. DUCHESNE: Thank you. And we still have one more recross from Ms. Tourangeau.

MS. BENSINGER: And the recross as you know must be limited to the questions asked --

MS. TOURANGEAU: Just that one question, yes. So you -- I know that you said you have only a passing familiarity with Chapter 373, but are you aware that the section that Ms. Racine just read to you is 2.B(4) phased development?

MARTHA REEVE: I'm sorry, I am not. This is all I see.

MS. TOURANGEAU: That's okay.

MARTHA REEVE: You all can refer to the regulations.

MS. TOURANGEAU: And the -- the section I was talking about --

MARTHA REEVE: It's not really a question for me.

MS. TOURANGEAU: -- is 2.C(2), which is for overall phasing. You're just not aware of the phasing requirements?

MARTHA REEVE: I am not, no. I don't know --

MS. TOURANGEAU: Thank you.

MARTHA REEVE: -- the rules by heart, I'm sorry.

MR. DUCHESNE: That's quite all right. I believe we are finished with this session. Thank you very much.

MARTHA REEVE: Thank you. Thanks a lot.

MR. DUCHESNE: We have been advised that this is being streamed on the internet and when people get too close to the microphone it blows out the audio for people listening online. And if there is anyone who is ever guilty of that say moi.

We have scheduled a 10 minute break, but I think we can accomplish this in five, so if you can line up for the bathroom according to need.

(Laughter.)

(Break.)

MR. DUCHESNE: Great. I believe we are ready to begin. Thank you again for your patience. Mr. Reichard is going to present his statement and just for the clarification for those in the room there has been some procedural orders and conference calls and we've been able to talk about this, so I'm sure he's up to speed on it, but every witness gets to make an opening statement which is broadly about anything that they wish to do and Mr. Reichard will have 10 minutes to do that.

MS. BENSINGER: Five.

MR. DUCHESNE: I beg your pardon, five minutes, and then will be able to present his summary of what he was just speaking to on the subject of financial capacity, which is what we're talking about here. So this will occur in two phases, his opening statement and then we'll be talking specifically about financial capacity. And with that, you may proceed. Thank you.

LAWRENCE REICHARD: Good morning. Oh. Good morning. Sorry, tv viewers. My name is Lawrence Reichard, as stated. I am a freelance journalist. I have lived in mid-coast Maine for most of the last 35 years. I have written extensively about Nordic

Aquafarms. In the fall of 2018, I traveled to Norway and Denmark to look into the operations of Nordic Aquafarms in those countries. And for four years I had an award winning column with the Republican Journal here in Belfast, Maine until I was fired under pressure from Nordic Aquafarms.

Before I get into the body of what I have, I wish to object to the exclusion of any of Mr. Bernacki's PowerPoint presentation. I think it should be noted that Mr. Bernacki has lived and been a hard worker and taxpayer in the State of Maine for decades and given the large amount of time that Nordic Aquafarms has been given in these proceedings, I think that some leeway should be given for someone who is not from 3,000 miles away. Thank you.

I would also like to correct a couple of -- wait, before I do that, as I said --

MS. BENSINGER: Excuse me.

LAWRENCE REICHARD: Yeah.

MS. BENSINGER: Before we get started, were you here when the Presiding Officer swore everyone in?

LAWRENCE REICHARD: Yes, I was.

MS. BENSINGER: Oh, you were. Okay.

LAWRENCE REICHARD: Yes.

MS. BENSINGER: And you were sworn in?
LAWRENCE REICHARD: Yes.
MS. BENSINGER: Great. All right. Thanks.
LAWRENCE REICHARD: Okay. You're very welcome.
As I said in a previous BEP meeting or hearing in Augusta, I think that all parties to this process here should be -- should use the word would and not will in reference to this project because it has not been approved and that's the very reason that we are here today.
I would also like to correct a couple of misstatements that were made earlier today. Mr. Pelletier asked Nordic Aquafarms whether it had three operations in Norway and Nordic Aquafarms did not correct that. There were two people from Nordic Aquafarms who responded to that and neither one corrected it. In point of fact, Nordic Aquafarms has only one operation in Norway. It was also stated by Nordic Aquafarms that it, quote, built up three fish farms in Denmark. That is false. Nordic Aquafarms purchased those fish farms. They did not build them. They did not design them.
And now to the body of my remarks. As -- excuse me just a moment. As stated, I'm a freelance

journalist. For two years I have been studying, researching, investigating and writing about Nordic Aquafarms and its proposal for an industrial fish factory in Belfast that would be highly polluting -- polluting -- would spew enormous amounts of carbon, fish feces, nitrogen and phosphorous into Belfast Bay, would devour vast amounts of fresh water, would destroy no less than 56 acres of beautiful mature forest, wetlands and wildlife habitat including the habitat of at least one threatened species, the bobolink bird. It would destroy a carbon sequestering -- a sequestering forest and would, as stated earlier, cart off 45,000 truck loads of carbon sequestering soil.

Let me also say that -- just a moment, let me skip down here, please. Let me also say that I have done and will continue to do anything and everything short of violence and property damage to protect and defend the mid-coast Maine community that I love and hold dearly and where I've lived for most of the last 35 years. And in protecting and defending my community I will bear no allegiance to any rules or regulations promulgated in edicts issued forth by persons, bodies or agency that in formulating such edicts has solicited and thus have

received precious little input from the good people of Belfast and Waldo County who will have to live with whatever decision this body makes. May any and all persons or corporations that seek to harm my community in these ways take note of and remember these words and I assure you that I am not alone. Any and all such persons and corporations seeking to exploit vast amounts of our water and destroy our environment would be well advised to take their investors' millions and go elsewhere.

As members of this body know, I asked to testify here today on matters of the proposed water use and financial capacity of the applicant Nordic Aquafarms and as you know you have received written testimony from me on these topic areas. Thus, there is no need to repeat that testimony, but I will say for the benefit of the public assembled here today that I have available copies of that testimony if they wish to see a copy of it. That's all I have for my opening remarks.

MR. DUCHESNE: Thank you. You may proceed right into your statements on financial capacity.

LAWRENCE REICHARD: In my submitted written testimony, I state that by Nordic's own admission it has raised only some $63 million, less than 13

percent of the $500 million it needs to complete its proposed Belfast industrial fish factory. And Nordic's ability to raise the remaining 87 percent of the funds it needs is in considerable doubt. Numerous global aquaculture trade journals have reported repeatedly and extensively on the considerable skepticism with which both insurance companies and banks view the new highly experimental and very risky business of land-based aquacultures -- aquaculture.

In a January 15, 2019 salmonbusiness.com article entitled Banks skeptical about financing land-based fish farms: Must have a better view of the overall risk. The article states Norwegian banks are still very skeptical about land-based aquaculture. Aquaculture manager at Norwegian Sparebank, Rune Sovdsnes, said that they, Sparebank, currently fund post-smolt facilities on shore but believe it's too early to contribute to funding for land-based facilities. Quote, full-scale farming of salmon on land is still a relatively -- in a relatively early phase. The biological risk is currently both significant and unresolved and we must remember that there are still major challenges for the post-smolt facilities that have been built. We

must see competitive land-based production is in the long-term competitive on both of cost and risk side before even consider financing this type of plant.

The article quotes Vegard Helland, Executive Vice President of Business Sparebank who says that developers, quote, must demonstrate extremely good expertise. I -- from my investigations of Nordic Aquafarms, I believe that Nordic Aquafarms falls willfully short in this category. I will get into that later if I have time and I am more than happy to entertain questions on that aspect.

Sparebank Executive Vice President Helland goes on to say, quote, farming is volatile stuff. If you start with larger projects on land and it works then we will see prices drop. Helland says Sparebank believes the lowest production cost still exists, quote, in the sea, unquote, as opposed to on land and Sparebank is uncertain whether land-based fish production in Norway will pay off at all. This is hardly a solid investment.

Insurance companies are equally leery. In a March 5, 2019 article, salmonbusiness.com quotes Geir Myre, the foremost aquaculture expert at XL Caitlin, the world's biggest aquaculture insurer is saying insurance for land-based aquaculture is, quote, a

money losing project, unquote. Myre goes on to say, quote, this has so far been a loss-making project for us, unquote. The article says, quote, Myre pointed to a number of risk factors related to water quality, biology, crew, technological risk, genetics and hydraulics. Hardly a sound investment.

And does Nordic Aquafarms even have insurance for its proposed Belfast project? Does it intend to get insurance? If so, where? Has it secured solid commitments for insurance coverage? If not, the above clearly demonstrates that Nordic Aquafarms may have considerable difficulty in obtaining such insurance. And what would happen if Nordic Aquafarms is unable to, unwilling to obtain insurance? Will the taxpayers of Belfast and the State of Maine be left to their own devices to clean up a huge and potentially contaminated industrial infrastructure and a potentially contaminated Belfast Bay? And what will happen if Nordic is unable to obtain enough financing to complete construction? Will Nordic Aquafarms cut and run after having destroyed dozens of acres of woods, wetlands and wildlife habitat?

Nordic Aquafarms has been repeatedly pressed in its public information meetings to secure a bond

to ensure that Belfast and Maine taxpayers will not be left holding the bag if something goes wrong with its proposed project, but so far the company has declined to make such a commitment. Nordic's apparent unwillingness to secure a bond indicates either a reckless disregard for the financial capacity of Belfast and State of Maine taxpayers or a weak financial capacity on its own part.

If banks and insurance companies are unwilling to touch many smaller land-based fish farms, why would they be willing to deal with a much bigger project, thus exposing themselves to much greater financial loss. That is all that I have on financial capacity.

MR. DUCHESNE: Thank you very much. I believe we can go right to cross by Nordic. Ms. Tourangeau.

MS. TOURANGEAU: Good morning, Mr. Reichard.

LAWRENCE REICHARD: Good morning.

MS. TOURANGEAU: Were the articles that you read in your testimony specific to Nordic?

LAWRENCE REICHARD: No, they were not. Clearly not. I did not say that they were. They were obviously clearly referring to the aquaculture -- the land-based aquaculture in general.

MS. TOURANGEAU: Are you aware that every time Nordic has sought capital it has been oversubscribed?

LAWRENCE REICHARD: That -- that -- I did not hear that -- oddly enough, I did not hear that stated earlier today. It seems to me that when Nordic's financial capacity has been under attack for a large part of this morning that someone would have said that on behalf of Nordic Aquafarms.

MS. TOURANGEAU: That every time they've gone out for investors it's been oversubscribed?

LAWRENCE REICHARD: That was your question and that's what I answered.

MS. TOURANGEAU: Are you aware that Nordic has insurance for all of its facilities and likewise will insure the Belfast facility?

LAWRENCE REICHARD: Well, I -- I fail to understand then why Mr. Heim earlier this morning would not answer the question of why they would not, in fact, take out or as he referred to it as a bond to ensure that Maine and Belfast taxpayers are not saddled with the cost of cleaning up their mess.

MS. TOURANGEAU: So do you think insurance and a bond are the same thing?

LAWRENCE REICHARD: As a resident of this

community who will have to live with the cost and abomination of having our environment destroyed then the difference between those is lost upon me.

MS. TOURANGEAU: Are there bonding requirements under SLODA or NRPA, the Site Location of Development Act or the Natural Resources Protection Act?

LAWRENCE REICHARD: As someone who loves this community and hikes on the Little River trail, I -- I find I struggle to care about the difference between those.

MS. TOURANGEAU: Thank you.

LAWRENCE REICHARD: You're welcome.

MR. DUCHESNE: I believe we can go to DEP Board questions. Any questions from the board? Any questions from staff? Mr. Martin.

MR. MARTIN: Mr. Reichard, so it's your position that the Department should be conditioning some sort of performance bond?

LAWRENCE REICHARD: Absolutely. As stated, I'm someone who very much loves to hike on the Little River trail and on -- and from their own depictions of their industrial fish factories that have been displayed for a considerable length of time here on the wall here today they will come within a few short

feet of the trail and will essentially destroy the trail as a wilderness experience and I would like to see someone come in and clean it up when they're gone, which by their own statements would be a maximum of 20 or 30 years and for the life of me, I can't figure out why the taxpayers of Belfast or Maine should be saddled with that cost.

MR. MARTIN: Thank you.

LAWRENCE REICHARD: You're welcome.

MR. DUCHESNE: Any other questions from the Board or staff? We can go to recross or redirect rather. Okay. Well, I guess there wouldn't be unless you'd like to ask yourself anything. And since there --

LAWRENCE REICHARD: Yeah. How are you doing? I'm doing fine. Thank you.

MR. DUCHESNE: Terrific. Thank you very much. I believe we can put an end to this portion. Thank you.

Congratulations, you're adhering to the schedule very well and it's been very respectful and I appreciate it. And I believe we can go right to water usage, which we had planned to start tackling in half an hour, so we are now ahead of schedule.

Before I begin, I would like to draw the

audience's attention to another celebrity who has joined our panel up here, a gentleman I have a whole lot of respect for, John Hopeck, but from Maine DEP staff. Thank you.

Is everyone all set? We can proceed to our next topic, which is water usage. And you may go.

EDWARD COTTER: Thank you, Presiding Officer. I'd like to summarize the project as it adheres to water usage. I will give you a summarization of the proposed operations and water supplies and then I also will hand it over to the rest of the panel to talk about more of the technicalities in detail.

Nordic utilizes recirculating aquaculture at their facilities. These are not flow-through systems, but they, in fact, recycle approximately 99 percent of the water that we bring into the system. That means that we reuse it over and over and clean it and process it through filters and other systems prior to eventual discharge of the 1 percent of the -- of the volume. The remainder -- the small exchange of water allows us to ensure the best water quality and fish welfare. This technology is leading technology in the industry for water scale facilities. As you'll hear from later testimony, NAF

water usage is the most efficient found in this segment. It is important to compare facilities based on quantity of output for production. When compared to other facilities as well as other food segments it is clear that the Nordic designs are a responsible and sustainable method of food production.

In addition to maintaining best in class water utilization, the selected site also allows for a series of four water supplies that allow for redundancy and resiliency. Those sources include salt water coming out of the Penobscot Bay, fresh water from a series of groundwater wells, as well as supply from the Belfast Water District, as well as a fourth supply which is the surface water at the Lower Reservoir. These are key to the proposed applications as they provide protection to the natural resources as well as for operation of critical infrastructure like water treatment and fish welfare systems. If one source is impeded for any reason reliance can be shifted more to the others. Additionally, there are many operational controls that can be utilized for the same purpose. The operations can be adjusted to operate on increased salinity should fresh water be influenced by outside impacts, feed rations can be reduced, therefore

reducing fresh water needs temporarily, and harvesting operations can be delayed or new cohorts in the hatchery can be held in quarantine postponing new tanks being brought on line or requiring water.

NAF proposes -- sorry, that's a repeat. So now, I'd like to pass the microphone to Dr. Mobile, who will talk about the investigation or the modeling of the water sources on site.

MICHAEL MOBILE: Can everyone hear me? Good morning, Presiding Officer Duchesne, Board members, Commissioner Reid and associated staff. I'd like to start by thanking you all for your time and attention to the matters being discussed here this week.

My name is Michael Mobile. I hold the position of managing partner of McDonald Morrissey and Associates. We use the acronym MMA, so if you hear me use that I'm referring to my company not the mixed martial arts. But a more descriptive technical title for me beyond managing partner would be groundwater hydrologist or a hydrogeologist. I hold three degrees, a Bachelor of Science degree in Hydrology from the University of New Hampshire, a Master's -- a Master of Science degree in Environmental Engineering from Virginia Tech and a Ph.D. in Civil Engineering from Virginia Tech.

My technical experience has been focused in the areas of quantitative hydrogeology and hydrology and in particular applications of models, so analytical and numerical modeling techniques to groundwater flow problems. It's terrifying for me to say this, but I'm approaching 20 years of experience in these areas and much of that has included the application and the creation of numerical models to assess large groundwater withdrawals throughout New England and beyond. Also relevant is the fact that I've lead professional seminars for private and state agency groups as well as taught the undergraduate and graduate level in terms of groundwater hydrology topics and marketable modeling techniques.

MMA as a company has a 30 year history, so they've operated since 1990. And throughout that operational period a vast majority of the work has involved numerical modeling of groundwater flow in some way, shape or form whether that's us constructing a model or reviewing work by others. Just a quick touch on MMA's role relative to Nordic's permit application or applications. We were retained to support the significant groundwater well permit process -- permit application process. Specifically our role was focused in the -- on the development of

a numerical groundwater flow model of the local aquifer system including the fractured bedrock aquifer from which Nordic's proposed wells would draw groundwater to support the water use plan.

The objectives of the modeling effort included assessing hydraulic responses within that aquifer system that's occurring below the proposed development under various pumping scenarios, so we're basically asking the question of what we created, what happens long-term if some rate of pumping occurs from some grouping of wells. So in other words, we're using a model that we've built using information and data gathered through a detailed site investigation that Tom will touch on in a moment to inform a robust modeling effort that we can then use in a scenario sense and make long-term estimates.

We've provided -- MMA has provided detail on the model in the form of a technical memorandum that accompanies the hydrogeologic investigation report as an appendix, Appendix F to be specific. And I've submitted written testimony prior to this hearing that also summarizes kind of the key aspects of MMA's modeling efforts and I just wanted to touch on a few takeaways from that work here today in my summary.

Number one is that the model was constructed

and applied using industry common techniques and the state-of-the-art modeling code as well as appropriate complimentary software. It's my professional opinion that the model is a reasonable representation of the subject groundwater system that has appropriately addressed the objectives that we set out to address.

Point number two is in applying the model we found that the results support a pumping scenario of 455 gallons per minute occurring from three bedrock supply wells. Support for that number comes in three forms, the first being what the model estimates in terms of the magnitudes of drawdown meaning the degree of change that can be attributed to pumping from static or average water levels. Second -- the second piece of support comes in the form of the model estimated rates of change meaning how long does the model estimate it will take for that drawdown to develop and stabilize. The third form of support comes in the form of a general model-based assessment of the primary sources of groundwater contributing to that -- that pumping that we're simulating within the model.

Item number three that I want to touch on is pertaining to uncertainty and of course we recognize that we are modeling and therefore

generalizing a complex environmental, complex natural system. Therefore, predictive uncertainty and limitations must be recognized when we interpret the results and we do that. We do that by making recommendations in our model that consist of collecting additional baseline data, monitoring conditions should pumping commence and developing a contingency plan to address unforeseen and unlikely events where conditions change outside of what the model is predicting.

So point number four now is that those recommendations in my opinion have been addressed in the form of a water resource monitoring plan and, again, Tom will describe here in a few moments what's been submitted by Nordic as a required component permit application package. I view that plan, which now is inclusive of refinements that have been made to address comments put forth through Maine DEP review, in particular two sets of comments presented to us by Dr. John Hopeck. So I view that plan now inclusive of those refinements as being thorough relative to our recommendations, but also having adaptability and as being protective relative to what's occurring in the area currently including the current use of other wells in the area.

So just to quickly summarize, detailed hydrogeologic investigation, a large volume of data, descriptive of site characteristics that informs what I view as a very robust and thorough modeling effort. The outcome of that model of course contains uncertainty and where we plan to address that uncertainty is in the form of a detailed and thorough water resource monitoring plan. Thank you.

THOMAS NEILSON: Can everybody hear me? All right. Good morning, Presiding Officer Duchesne, Members of the Board, Director Reid and staff -- or Commissioner Reid, I apologize. Thanks for your time and consideration today.

My name is Thomas Neilson and I've noticed my name is actually misspelled in the schedule, so I'd like to correct that just for the record. It's spelled N-E-I-L-S-O-N. I'm a geologist at Ransom Consulting where I work on hydrogeologic investigations throughout Maine and the northeast. I hold a Bachelor's degree in Geology from the Colorado College and a Master's of Science degree in Geology from the University of Vermont.

My professional experience has concentrated on hydrogeologic investigations in Maine and the rest of the northeast with a focus on water supply

exploration, development and monitoring. I have significant experience conducting hydrogeologic work in fractured crystal and bedrock, as we'll see this aquifer is here, sedimentary bedrock and sandy gravel systems. In addition, I've authored and co-authored several peer reviewed research articles. I've been a member of several research teams conducting cutting edge research and I've instructed college and high school level students in geology.

My role in the proposed Nordic Aquafarms development has been to identify, explore and assess the fresh water resources at the proposed development site that have the potential to supply Nordic's land-based aquaculture facility. My role is revolved around designing and implementing hydrogeologic investigations that Mike talked about briefly as well as to design a monitoring plan that will accompany the proposed extractions that is protective of natural resources and existing aquifer users at and surrounding the site.

The work we've completed on behalf of Nordic is detailed in two primary documents that we've included in Nordic's permit applications. Those are the hydrogeologic investigation report, which I'll often refer to as the HGI, and that details all of

the -- the field work that was conducted, all of the data that was collected as well as the water resources monitoring plan, which I'll sometimes refer to as the WRMP and Mike has already introduced that as well. And as Mike mentioned, the water resources monitoring plan has evolved over the course of this proceeding through comments from Dr. John Hopeck and so I view that document not as just what was submitted but what is also in the record regarding updates and revisions to that.

During our hydrogeologic investigation we identified two primary fresh water resources at the site, those are groundwater from the fractured bedrock aquifer beneath the site and surface water from the Lower Reservoir of the Little River, which has historically been used as a primary and back-up water supply for the Belfast Water District before they fully develop their groundwater supply in Goose River aquifer, which is some ways away. Groundwater would be withdrawn from a network of three production wells installed in the fractured bedrock -- bedrock aquifer and municipal water would be purchased from the Belfast Water District as a third source of fresh water.

So I'll take a few moments to describe each

of these three sources of refresh water. The proposed surface water withdrawal is based on the Department Chapter 587 rules for in-stream flow and an analysis of the estimated flow statistics for the Little River watershed. Based on our assessment the baseline withdrawal of 70 gallons per minute, which I'll refer to as GPM, was allowable from the Lower Reservoir under Chapter 587 rules. Because the Little River below the river dam is tidal the rules also allow for in-flows from the Little River into the Lower Reservoir to be withdrawn, so the maximum instantaneous withdrawal from the Lower Reservoir can be equal to the in-flow from the Little River plus that 70 GPM number. For the purpose of planning this project, we suggested using the 5 percent duration flow of the Little River, which is about 250 gallons per minute and that represents a conservative estimate of the reliable flow through the Little River. Just as a point of comparison, the estimated mean annual discharge from the Little River watershed is approximately 15,500 gallons per minute and the lowest estimated mean monthly discharge from the Little River is about 2,500 gallons per minute. So over most of the course of the year it's reasonable to expect that the Little River will be passing more

water through -- more fresh water through the Lower Reservoir than the entire project demand would require.

The proposed on-site groundwater withdrawal would come from three production wells installed in fractured bedrock aquifer. We conducted extensive hydrogeologic investigation which included drilling 13 bedrock test wells totaling over 3,700 feet of drilling and monitoring a network of 27 points, which included private wells, bedrock wells, overburden wells, the Little River and both reservoirs. We leveraged this -- this monitoring network to conduct a series of four pumping tests where we collected over a million individual measurements, which were ultimately used to create the groundwater model constructed by Dr. Mobile and his team at MMA. We arrived at the recommended groundwater withdrawal rate of 455 gallons per minute through analysis of our investigation findings and through predictive simulations using a model. This withdrawal is proposed to be distributed across a network of three wells located in the southeastern portion of the site and that network was specifically configured to minimize potential impacts to private wells in the area.

The third source of fresh water for Nordic's proposed facility would be purchased from the Belfast Water District. There is -- Nordic and the District have an agreement where Nordic would act as a customer of the district with the ability to purchase up to 500 gallons per minute through the existing Belfast Water District. The District has conducted an independent capacity evaluation and gone through the approval process with the Public Utilities Commission for that agreement. From a hydrologic perspective, I think it's important to note that the Belfast Water District's supply comes from the Goose River aquifer which is located in the Goose River watershed, which is independent of the Little River watershed located some miles away, but they're hydraulically or hydrologically independent of each other.

Considering all three fresh water sources together the proposed fresh water supply system for Nordic is resilient. It consists of two independent groundwater supplies and one surface water supply, so fresh water use can be optimized for each source as needed. And as Ed mentioned in his opening statement here, if an overall reduction in fresh water use is required Nordic can adjust their operations to make

that happen and reduce their total fresh water demand.

So that brings me to the monitoring plan. As Mike mentioned, with any subsurface investigation there is always a point of which you have to acknowledge the underlying uncertainty and come up with contingencies for how to monitor that and in order to mitigate against this uncertainty Nordic has proposed a water resources monitoring plan and is designed to protect existing groundwater users and sensitive resources from unexpected adverse impacts. The monitoring plan includes a proposed network of 50 monitoring points which includes private water supply wells, the upper and Lower Reservoirs of the Little River, the free-flowing reach of the Little River, wetlands and bedrock and overburden groundwater. So in order to satisfy the requirements of SLODA and city permits the goals of the water resource monitoring plan are, one, to continue baseline data collection to document the range of pre-development background conditions; two, to collect a robust dataset able to capture changes in conditions due to development, groundwater extraction and surface water withdrawal as well as natural variations that may occur; three, to evaluate a regularly updated dataset

to assess potential impacts to existing groundwater users, natural resources and waters of the state; four, to establish performance criteria and warning levels to serve as thresholds indicating increased potential risk of adverse impacts; and five, to trigger the implementation of an action plan to adjust operations should significant impacts be identified.

Through ongoing communication with the Department, Nordic has comitted to developing performance standards and thresholds that will allow for adverse impacts to be detected before they occur. If these performance standards are exceeded the water resources monitoring plan provides a road map for remedying the issue. This can include things like water system upgrades for a private well owner, making operational changes to their facility or even connecting private water users to public water supply.

So in summary, we've conducted a thorough and appropriate investigation of the fresh water resources available to Nordic in Belfast. From this we've developed a proposed fresh water supply system that achieves resiliency through its diversity of sources and Nordic's own operational flexibility. In

any investigation of this nature is a certain degree of uncertainty that remains, however, Nordic has proposed a robust monitoring plan that is protective of existing users and sensitive resources and we look forward to finalizing the details of this plan with input from the Department.

EDWARD COTTER: Prior to wrapping up, I do want to clarify one item that we've seen that is a factor or an area of confusion. So we talked about the resources and the monitoring and the modeling of those resources and I want to make sure that it's clear from us that what we have modeled is what we feel is the capacity of the resources and the amount of withdrawal that is responsible without any risk or with minimum risk of adverse impacts. What we have not stated is what our requirements are, so we find those to be very different and we want to make sure we understand what the capacity and the ability of the natural resources are and we shape or project to that. We have not stated the demands that we need because they're flexible, as I've noted. We have many different ways of reducing needs based on the environmental needs around us and so I just wanted to talk about that. And we look forward to any questions. Thank you.

MR. DUCHESNE: Thank you. At this point in our calendar schedule we were planning to break for lunch. It appears we can break a little early and then start a little early this afternoon. We had planned on a lunch break of 45 minutes. Would that be suitable? Not that I'm actually asking permission.

(Laughter.)

MR. DUCHESNE: All right. We will break for 45 minutes and we will resume at 12:30, it will be with cross-examination from Mr. Reichard.

(Luncheon recess.)

MR. DUCHESNE: Thank you for your patience. We are all reassembled. Before we get started there is a question about how do you access this online, which is going to be a mystery to anybody who is trying to find it online and can't hear it right now, but you go to maine.gov/dep/bep and at the bottom of that page there is a link that says DEP's virtual meeting room. So once again, that's maine.gov/dep/bep and you'll find the link at the bottom of the page called DEP's virtual meeting room.

And without further adieu, I think we are set to go ahead with cross-examination starting with Mr. Reichard.

LAWRENCE REICHARD: Well, as you can see, I'm not an engineer. Okay. I have a number of questions that I had previously, but before I get to those I would like to ask some questions that arose this morning. Mr. Heim said that -- that the production of this industrial fish factory will displace foreign imports. Mr. Heim, will Nordic Aquafarms not be importing the overwhelming majority of the ingredients of its fish meal?

MS. TOURANGEAU: Objection. This doesn't go to the water use panel.

MR. DUCHESNE: It -- I think that will be a topic, but we're on water usage right now.

LAWRENCE REICHARD: Okay.

MR. DUCHESNE: And that's what this panel is prepared to talk about.

LAWRENCE REICHARD: Okay. I just wanted to correct some misinformation that was spewed this morning.

Mr. Heim, if you are allowed to build this industrial fish factory that you propose, how much water would your individual fish tanks hold?

MR. DUCHESNE: You're going to have to share the mic.

ERIK HEIM: There are various sizes of tanks

in the facility.

LAWRENCE REICHARD: Okay. Does your estimate -- estimate of water usage include the water that would be needed to refill your tanks in the event of outbreak of disease, virus or bacteria?

ERIK HEIM: I think I've addressed that before. In general, every system is compartmentalized, so -- all the individual systems. And we have the capacity to fill up and empty tanks accordingly as we need to.

LAWRENCE REICHARD: Can you please answer the question? The question was does your estimate of water usage include the water that would be needed to refill your tanks in the event of an outbreak of disease, virus or bacteria?

ERIK HEIM: If that should happen, yes, we do.

LAWRENCE REICHARD: And that -- I -- you still haven't answered the question. Does your estimate of water usage include this?

ERIK HEIM: We take into account all scenarios as we always do in preemptive planning and we also take into account worst case scenarios including that, yes.

LAWRENCE REICHARD: Okay. In -- in light of

the enormous amount of water that will be needed to refill your tanks, which you have described as the biggest in the world, has your Maximus smolt factory in Hanstholm, Denmark ever had an outbreak of disease, virus or bacteria either before or after Nordic Aquafarms bought it?

MS. TOURANGEAU: Objection. This again goes to contamination issues and fish disease issues not water issues.

LAWRENCE REICHARD: And that's incorrect. It goes to their amount of overall water use as we have just discovered.

MR. DUCHESNE: Yeah, I'm inclined to agree with Mr. Reichard. I think -- yeah, the objection is noted, but I think what he's getting at is is there enough water to take care of emergencies and I think that's relevant.

MS. TOURANGEAU: Okay.

LAWRENCE REICHARD: Can you answer the question, please?

ERIK HEIM: Yes, we have full flexibility in terms of the ways we empty and fill up tanks. Sometimes they're taken out for maintenance and that is all built into the model.

LAWRENCE REICHARD: Okay. Perhaps you

didn't hear my question. Has your Maximus smolt factory in Hanstholm, Denmark ever had an outbreak of disease, virus or bacteria either before or after Nordic Aquafarms bought it?

MR. DUCHESNE: Okay. At this point it is straying off into the --

LAWRENCE REICHARD: It's the same question I asked before.

MR. DUCHESNE: -- health of the fish. So the -- if I understand correctly, and I will -- I have already ruled on this, the question is do you have the capacity to handle emergencies including fish disease outbreak and I think the answer is --

LAWRENCE REICHARD: Yes, and I'm trying to establish how common those problems are.

MR. DUCHESNE: And I believe his answer was yes and you may proceed.

LAWRENCE REICHARD: That is not what I heard. Do you -- do you have any idea why the world reknown Danish aquaculture expert Bent Urup told me in his office in Fredericia, Denmark in September of 2018 that your Maximus industrial fish factory in Hanstholm, Denmark had, in fact, suffered one or more such various unfortunate incidents?

MS. TOURANGEAU: Objection. Again, this

goes to fish health not to water use.

MR. DUCHESNE: Yes, sustained.

LAWRENCE REICHARD: Do you have any idea why a former Maximus employee told me in September of 2018 that Maximus, in fact, suffered calamities such as this on a regular basis?

MS. TOURANGEAU: Objection.

MR. DUCHESNE: It seems to me you're straying off into the same question over and over and what we need to focus on is water usage. Thank you.

LAWRENCE REICHARD: That's what I'm trying to get at. Bear with me a moment because it seems that all of my relevant questions are being shot down. Every time Nordic Aquafarms factory fish reach maturity and are slaughtered, will you have to clean and drain the industrial fish tanks in which the fish lived before they were slaughtered?

ERIK HEIM: So any fish farm when you transfer fish from one to another it totally depends on what phase you are in and --

LAWRENCE REICHARD: When you say transferred, do you mean slaughtered?

MS. TOURANGEAU: Objection. You need to allow the witness to answer the question.

MR. DUCHESNE: Yes, if the witness would go

ahead and finish your sentence.

ERIK HEIM: No, we did not clean out individual tanks when we move fish from one place to another.

LAWRENCE REICHARD: You do not?

ERIK HEIM: No, we do not. They're self-cleaning systems.

LAWRENCE REICHARD: Self-cleaning systems. Do those systems ever break down?

ERIK HEIM: In theory they can, that's why you compartmentalize them with different systems --

LAWRENCE REICHARD: Have any --

ERIK HEIM: -- so that if you have any problem in one place it doesn't affect the others.

LAWRENCE REICHARD: Have they ever broken down in your three industrial fish factories that you currently own?

ERIK HEIM: They have not.

LAWRENCE REICHARD: Is -- is the water usage that you may incur in refilling the tanks in the event -- when fish are slaughtered is that figured into your overall use -- the water use estimates.

ERIK HEIM: The water is recycled so when we empty one tank we can reuse that water, so --

LAWRENCE REICHARD: When --

ERIK HEIM: Yes.
LAWRENCE REICHARD: When you need to clean your tanks because you have suffered disease or bacteria or virus, what -- will you be using toxic chemicals to do so?
MS. TOURANGEAU: Objection. This doesn't go to water use.
LAWRENCE REICHARD: If you'll give me just a little bit of leeway here, I need to establish that they are using extra water in order to adequately clean out these toxic chemicals.
MR. DUCHESNE: I'll let it go just that far.
LAWRENCE REICHARD: Okay. Would you please answer the question?
ERIK HEIM: In terms of water use for cleaning, that's minimal.
LAWRENCE REICHARD: That's minimum. So you --
ERIK HEIM: Minimal, yes.
LAWRENCE REICHARD: So you may use a minimal amount of water to clean away toxic chemicals, do I understand you correctly?
ERIK HEIM: We don't use toxic chemicals.
LAWRENCE REICHARD: You do not use toxic chemicals?

ERIK HEIM: No.

LAWRENCE REICHARD: Would you call Vircon S a toxic chemical?

ERIK HEIM: We are all -- everything we're using is --

MR. DUCHESNE: Once again, if I may, and before counsel objects as well, we're on water usage. And I -- I mean no disrespect, but what I'm saying is the panel here -- the panel of experts and the pre-filed testimony all deals with water usage, that's the questions they're prepared to answer --

LAWRENCE REICHARD: Yes, sir.

MR. DUCHESNE: -- and so I would like you to be focused on that if you can.

LAWRENCE REICHARD: Okay. I certainly understand that, but --

MR. DUCHESNE: Okay.

LAWRENCE REICHARD: -- I believe that this goes directly to that. Mr. Heim has just said that they do not use toxic chemicals therefore they do not need to use extra water in order to disperse and clean away those toxic chemicals. Mr. -- Nordic Aquafarms submitted a list with dozens of chemicals on it, some of which are highly toxic.

ERIK HEIM: They're all approved in the U.S.

for aquaculture.

LAWRENCE REICHARD: Well -- okay. Will you be using Vircon S, I believe that was on your list?

ERIK HEIM: It has nothing to do with water use.

LAWRENCE REICHARD: Will you be using Vircon S?

ERIK HEIM: That's for the other experts on our team to answer and describe.

LAWRENCE REICHARD: Are you not familiar with the list that your own company submitted?

ERIK HEIM: I think when you want comments on specific compounds that should be answered by experts.

LAWRENCE REICHARD: Okay. Then I ask your experts, will Nordic Aquafarms be using the chemical Vircon S?

MR. DUCHESNE: Begging your pardon, we don't have those experts here. This is the water usage panel, which is why we're trying to focus the questions on that. Again, thank you.

LAWRENCE REICHARD: Okay. Well, I take it then that you are not familiar with the list that your own company submitted. Okay.

MS. TOURANGEAU: Objection. You can't

summarize an answer. That was -- there was no question. That was just testimony.

LAWRENCE REICHARD: Will the --

MS. TOURANGEAU: Move to strike.

MR. DUCHESNE: Sustained.

LAWRENCE REICHARD: Will the chemical -- the toxic chemicals that Nordic Aquafarms uses end up in Belfast Bay?

MS. TOURANGEAU: Objection. Again, that doesn't go to water usage.

LAWRENCE REICHARD: That goes directly to water usage.

MR. DUCHESNE: That goes to water treatment and, again, we're not on that panel. Thank you.

LAWRENCE REICHARD: If a -- if a worker were to suffer an eye injury from handling a chemical such as Vircon S, which is extremely dangerous to eyes or from handling the chemical without protective eyewear, could that result in an accident such as spilling an excessive amount of that chemical or other chemicals which would then result in Nordic Aquafarms having to use more water in order to clean away that excessive amount of toxic chemicals?

MS. TOURANGEAU: Objection.

MR. DUCHESNE: Sustained. Once again, this

is water usage, not chemical usage, not toxicology, it's on water usage.

LAWRENCE REICHARD: I believe that goes directly to water usage. As I have established earlier if they use toxic chemicals --

MR. DUCHESNE: As the Presiding Officer, I'm going to maintain that it doesn't and we need to focus on the question. Thank you.

LAWRENCE REICHARD: Well, having so many of my legitimate questions regarding water usage shot down that is all that I have. I'm more than happy to answer any questions that the panel might have and I invite anyone -- everyone on the panel and here today to read my writings on this matter.

MR. DUCHESNE: Thank you very much. We can now move to cross-examination by Upstream Watch.

MS. RACINE: Just a quick point of clarification before I begin, Dr. Mobile, am I pronouncing your name correctly?

MICHAEL MOBILE: Mobile.

MS. RACINE: Mobile.

MICHAEL MOBILE: Mobile like the city in Alabama.

MS. RACINE: Thank you so much.

MICHAEL MOBILE: You're welcome.

MS. RACINE: And it's Neilson, correct?
THOMAS NEILSON: Correct.
MS. RACINE: Okay. Thank you for that clarification. Dr. Mobile, in your direct testimony you were asked I believe it was in September 2018 to support an assessment of the local groundwater system in the vicinity of the proposed Belfast, Maine project, is that your recollection?
MICHAEL MOBILE: That's correct.
MS. RACINE: And you provided support to Nordic in the form of modeling on-site subsurface water and the effects of pumping that subsurface water for use by Nordic, right?
MICHAEL MOBILE: By producing a model to assess those conditions, yes.
MS. RACINE: And -- right. You constructed that model for them?
MICHAEL MOBILE: That's correct.
MS. RACINE: And to construct your model I understand you used both public and private data derived from others; is that correct?
MICHAEL MOBILE: That's accurate.
MS. RACINE: You didn't derive the groundwater data from the site yourself, I take it?
MICHAEL MOBILE: I, myself, did not collect

those data, no.

MS. RACINE: So you accepted data provided to you by both Nordic and Ransom Consulting; is that correct?

MICHAEL MOBILE: That's accurate.

MS. RACINE: And I assume to perform your model you assumed that the data provided to you was reasonably accurate?

MICHAEL MOBILE: That's correct.

MS. RACINE: In Paragraph 12 of your pre-filed direct testimony you observed that recharge from rain water represents, quote, the major source of water to the modeled groundwater system with supplemental water from the reservoir/pond leakage. Did I read that correctly?

MICHAEL MOBILE: Can you refer me to the specific section of my testimony?

MS. RACINE: Sure. Paragraph 12.

MICHAEL MOBILE: The item number 12?

MS. RACINE: Yes.

MICHAEL MOBILE: Okay.

MS. RACINE: And once you have it I can read it again.

MICHAEL MOBILE: I'm there.

MS. RACINE: Okay. You stated that recharge

from precipitation, or rain water, represents the major source of water to the modeled groundwater system with supplemental volume being provided from the reservoir/pond leakage. Did I read that correctly?

MICHAEL MOBILE: You did.

MS. RACINE: Okay. And you then -- you modeled what you called the local groundwater system under several different projected pumping regimens; is that correct?

MICHAEL MOBILE: Yes, we call them scenarios, but, yes, locations, pumping locations.

MS. RACINE: Different scenarios.

MICHAEL MOBILE: Correct.

MS. RACINE: And you concluded from looking at those scenarios that 455 gallons per minute could safely be extracted from the subsurface without negatively impacting private water supply wells located west of the proposed facility; is that right?

MICHAEL MOBILE: That is correct, yet I will add the caveat that we made recommendations at the end of our technical memorandum that were to be addressed in order to make that statement accurate.

MS. RACINE: Did that include the water resource monitoring plan?

MICHAEL MOBILE: The recommendations flowed into actions that are proposed within the water resource monitoring plan, that's -- that's --

MS. RACINE: That's accurate?

MICHAEL MOBILE: -- correct. Yes.

MS. RACINE: As well as a contingency plan for changes attributed to the effects of site-related pumping?

MICHAEL MOBILE: I'd like to refer to my technical memorandum to make sure that that's an accurate description.

MS. RACINE: Sure. Take your time.

MICHAEL MOBILE: I apologize. I'm not organized like Tom is.

MS. RACINE: That's okay. I believe if you look at Page 5 Paragraph 15 of your direct, the statement you -- you recommend developing contingencies to address...

MICHAEL MOBILE: Okay. I've -- I've got that in front of me.

MS. RACINE: Okay. So the question was you recommended contingency plans for changes attributed to the effects of site-related pumping.

MICHAEL MOBILE: So where I'm struggling there is the plan, the word plan is not used. We are

suggesting to develop contingencies to address cases where current use changes, for example reduced well yield, can be attributed effects caused by site-related pumping. That's the quote.

MS. RACINE: And so you're recommending to Nordic that they should develop these contingencies.

MICHAEL MOBILE: Yes, in our memo, yes.

MS. RACINE: Okay. Is what I've asked you so far collectively a reasonably good description of what you were asked to do and what you have done for Nordic?

MICHAEL MOBILE: There are pieces of it, yes. I think we did a lot more than your description summarizes.

MS. RACINE: I'm sure -- I am sure I am oversimplifying them a bit considering your expertise, but in general what you were asked to do and what you produced?

MICHAEL MOBILE: Effectively, yes.

MS. RACINE: Okay.

MICHAEL MOBILE: What you said is accurate.

MS. RACINE: Are you also familiar with the work from Maureen McGlone from Ransom for certain stormwater management on the proposed site?

MICHAEL MOBILE: Not specifically, no.

MS. RACINE: Okay. Well, Miss McGlone has proposed a plan to install perimeter drains around the entire site collecting water running onto the site from upgradient locations and discharging that water to the Little River below the Lower Dam. She's proposed to collect also the stormwater from all of the impervious surfaces on the site into a series of detention basins, which then discharge to the same perimeter drains and ultimately to the Little River just below the Lower Dam. So would it be fair to say that following construction most of the 35 acres of the project that will be developed will be covered with impervious surfaces?

MICHAEL MOBILE: Well, or it will be handled with the stormwater management, so not --

MS. RACINE: So it will either be the perimeter drains --

MICHAEL MOBILE: -- necessarily impervious surfaces.

MS. RACINE: -- or it will be covered with impervious surfaces?

MICHAEL MOBILE: Stormwater will be managed.

MS. RACINE: Okay. So post-construction the

water that currently flows onto the site from the upgradient and the water that currently just falls directory on the site is going to be collected and discharged to the Little River below the Lower Dam?

MICHAEL MOBILE: Some of that water.

MS. TOURANGEAU: Objection. This goes to the stormwater system. This is outside the scope of Dr. Mobile's...

MR. DUCHESNE: Thank you. I note the objection, but I'm going to allow the question because I think I know where counsel is going with this, so.

MS. RACINE: Thank you. I'm almost there. So the only recharge remaining on the site then according to the conclusion of your report about the recharge would then be the leakage from the bottom of Reservoir Number 1?

EDWARD COTTER: If I could step in also. There are several systems of stormwater on the site, some do discharge to the Little River, others do discharge after treatment into the surface. So I don't think it's accurate to characterize all stormwater as being discharged off-site.

MS. RACINE: Would it be accurate to say that it at least reduces the recharge for which Dr.

Mobile says would be the source of recharge; in other words, it would cause a reduction?

EDWARD COTTER: It's accurate to state that there is a reduction of recharge on the site itself within our 35 acres.

MICHAEL MOBILE: And I'll add to this too. The area of the site is generally currently as it stands mostly covered by a deposit known as the Penobscot Formation that's a very tight silton clay glacial marine deposit that has a very significant limiting effect on the amount of recharge on the process that you're alluding to that was direct precipitation falling on the surface infiltrating and making its way directly down to groundwater. So we've already recognized that within the model that that's a low recharge condition. We've also run the model and reduced the recharge condition on top of that to see if there is a significant sensitivity to a reduction in recharge and we did not see a significant reduction -- or a significant sensitivity there. So the --

MS. RACINE: Did you specifically take this consideration about the stormwater system into consideration when you were making those determinations?

MICHAEL MOBILE: We did not run the specific scenario --

MS. RACINE: You didn't run that specific scenario.

MICHAEL MOBILE: -- about that, no.

MS. RACINE: Okay. Have you reviewed the subsequent -- oh, in your pre-filed direct testimony, excuse me, you state that the comments presented to Nordic by the state application reviewer Dr. John Hopeck resulted in, quote, proposed refinements to the WRMP that are detailed within the response letter provided as Nordic Exhibit 5; is that correct?

MICHAEL MOBILE: I did say that, yes.

MS. RACINE: Have you actually reviewed the subsequent review memorandum authored by Dr. Hopeck dated January 14 and revised January 27?

MICHAEL MOBILE: I have.

MS. RACINE: As to water supply on Section 5-A, the memorandum states that, quote, there are reasons to believe that model submitted underestimates the potential for loss of surface water to the fractured bedrock aquifer and the applicant does not explicitly address this in the response. Do you have a response to that statement at this time?

MICHAEL MOBILE: I do. Can you please direct me to where that is in that letter, please.

MS. RACINE: Sure. It's Paragraph 5, Section 5-A in the revised January 27 revised memorandum.

MICHAEL MOBILE: Yes. So what Dr. Hopeck is referring to there is the manner in which we represent the region of the Little River that stretches between the upper and Lower Reservoirs. So when we develop our three dimensional model we make decisions about how we represent the geology and the layering of the geology in the model domain and we in constructing that model represent the unconsolidated segments are referring to the Presumpscot formation and the results of the amount of glacial soil present within the model domain, so we use the upper layer of the model to represent those features. We use a second layer in three dimensions, the second layer of the model to represent the upper portion of the bedrock aquifer that's more highly weathered than the more competent portion and then we use a third layer to represent the deeper fracture bedrock aquifer.

In the vicinity of that stretch of the Little River there is based on some of the figures included in our technical memorandum you can

distinguish that that weathered bedrock layer is apparent in the vicinity of the Little River, so what Dr. Hopeck is alluding to is a representation of, you know, this weathered bedrock zone and the possibility that that zone is limiting the amount of connection between the deepest portion of the model, that third layer, and the superficial layer that we represent in the model.

Now, I would present it just slightly different. I -- I fully respect Dr. Hopeck and have appreciated his insight on these things, but I think what this really begs the question of is does the model prediction from leakage of that feature is it entirely accurate and that remains to be determined. We have additional data to be collected through the water resource monitoring plan to fully evaluate that condition. I think it is a reasonable representation based on the data we have. We certainly have testing data that show hydrology on-site pumping across that river which would go more along the lines of that representation -- current representation is probably appropriate. I'll also note that below the section that you selectively read Dr. Hopeck notes that, however, the Department considers that, in general, the residence time of water in the reach of the

Little River between the two reservoirs, which is also the reach in which the effects of greatest drawdown in the bedrock aquifer will occur and which is largely exposed bedrock, will be small.

MS. RACINE: Yes, I -- I read that as well, but I'm hearing you say that there would be additional data that you would need to update your model to be more accurate in response to this comment.

MICHAEL MOBILE: Not necessarily update the model but further assess the natural environment.

MS. RACINE: Which is not data that you currently have?

MICHAEL MOBILE: That's right, we don't have that.

MS. RACINE: Okay. And as part of your model of your groundwater withdrawal, did you model or predict the effects of salt water dilution, did you do that?

MICHAEL MOBILE: No, the model is a hydraulic model. It represents a single density, fresh water density, it's not a variable density model or a soluble transfer model.

MS. RACINE: So you didn't evaluate salt water intrusion in your model?

MICHAEL MOBILE: Not explicitly.
MS. RACINE: Okay. And does your modeling predict what would occur to groundwater supply if the reservoir was non-existent?
MICHAEL MOBILE: Non-existent, no.
MS. RACINE: Okay.
MICHAEL MOBILE: We did run a simulation that generally assessed the sensitivity of the hydraulics to a reduction in reservoir stage, so a reduction of 2 feet in the Lower Reservoir to see how sensitive, again, our predictions of drawdowns were to that condition and we saw limited sensitivity there as well.
MS. RACINE: But the model doesn't reflect a scenario in which the reservoir does not exist?
MICHAEL MOBILE: No, we did not run that scenario.
MS. RACINE: Dr. Neilson, you were asked to identify, explore and assess fresh water resources needed for this project as well; is that correct?
THOMAS NEILSON: I was. I'd just like to clarify I don't have a Ph.D.
MS. RACINE: Oh, I'm sorry, Mr. Neilson. Thank you for the clarification.
THOMAS NEILSON: That's all right.

MS. RACINE: You identified three sources for the project; is that correct?

THOMAS NEILSON: That's correct.

MS. RACINE: On-site bedrock wells drilled to 500 feet are estimated to provide the 455 gallons per minute; is that correct?

THOMAS NEILSON: Yeah. Is that a quote or?

MS. RACINE: I -- as far as I understand it's --

THOMAS NEILSON: Yes.

MS. RACINE: -- the 455 was the -- was the amount determined by Dr. Mobile.

THOMAS NEILSON: Yes. Yeah, 455 gallons per minute is what we recommend as a withdrawal.

MS. RACINE: Okay. And 250 gallons per minute will be extracted from the Lower Reservoir and that's the plan?

THOMAS NEILSON: The -- the recommendations for the surface water withdrawal, 250 gallons per minute represents a planning flow not the recommended withdrawal, so as I discussed in my verbal testimony earlier the recommended surface water withdrawal takes into account the Chapter 587 rules, which state that based on seasonality you can drawdown the reservoir a certain amount, that works out to about

70 gallons per minute plus inflows to the reservoir, so we chose 250 gallons per minute as a planning flow because it conservatively estimates the flow of the Little River into the Lower Reservoir.

MS. RACINE: But as I understand it based on your recommendations Nordic is planning on having 250 gallons per minute available to it from the reservoir?

THOMAS NEILSON: It -- I think generally they are planning on having surface water available to them. They're -- the 250 gallons per minute is not what we actually proposed as the permitted withdrawal rate, so what we propose is the permitted withdrawal rate is 70 gallons per minute plus inflows that are demonstrated to have occurred into the reservoir.

MS. RACINE: So the 250 gallons per minute wouldn't be a constant figure, it would be variable?

THOMAS NEILSON: It would be dependent on the flow of the Little River into the Lower Reservoir.

MS. RACINE: In fact, in your rebuttal you don't dispute that a failure of the Lower Dam has a potential to impair Nordic's ability to withdraw up to 250 gallons per minute?

THOMAS NEILSON: With regard to the Lower Dam, the current scenario is based on the Lower Dam existing and it's based on the assumption of the Lower Dam continuing to exist, but I would like to add that everything that we have seen in terms of inspections of the dam indicate that the dam is still very serviceable with regular maintenance and upkeep it is -- there is no question as to the stability of the dam as far as I understand the reports that have been conducted.

MS. RACINE: Yes. And I understand you -- you did indicate that it is dependent on the Lower Dam and that's -- that can continue to be so long as it's safely repaired and maintained as you just stated. I guess this could be to the entire panel, has there been any indication who will be safely repairing or maintaining the dam?

EDWARD COTTER: The Lower Dam or the Upper Dam for that matter are not currently included in our project. They are -- the Lower Dam is an option to purchase, but it is not something we have decided on. The 250 gallons that has been discussed as a planning figure for the reservoir has been used by Nordic Aquafarms in our planning as a potential for resiliency and redundancy. We do not rely solely on

that amount. If changes occurred in the environment around us to such that that 250 gallons were not available, we would have to at just our operations we would have to adjust our operations, we would have to adjust our planning, but as of right now there is no foreseeable future that we see where that dam is not in service.

MS. RACINE: Yes, you brought that up. I heard that earlier that -- that if for some reason one of these three fresh water sources wasn't available in the quantity or perhaps at all that there would be -- you had the ability to shift to using additional amounts of salt water, for example. What would the introduction of that additional salinity do to the efficiency of your treatment systems and how much time would it take Nordic to adjust?

EDWARD COTTER: We plan our operations on the best situation for fish growth and fish welfare as well as operation of our filtration and treatment system. If we need to make adjustments due to upcoming shifts that we see whether it be weather phenomenon where we think there is a drought situation or whether it is a Belfast Water District where they're doing some service on a pipeline and

they need to take us off right away, we can make a number of shifts and adjustments in our operation both long-term and short-term.

MS. RACINE: I mean, surely, and we're talking about 455 gallons per minute from the ground up to 250 gallons per minute from the -- from the surface water, if one of those were to possibly quite suddenly not be available, I imagine the introduction of the replacement of that water with a much higher salinity would require quite the overhaul and how much time would that take?

ERIK HEIM: Okay. I'd just like to make clear we're exchanging 1 percent of the water continuously, which means that if you raise the salinity level it takes quite a bit of time before you get a material rating increase in your tanks. And we are well within increasing or decreasing salinity by several PPT without any complications. If you were to increase them by like 10 PPT then you might run into having complications, but that would not happen as a consequence of that.

MS. RACINE: Why not just start with more salt water if there are going to be uncertainties built into these fresh water sources?

ERIK HEIM: Like Ed said, these are

redundancies that we have available for the system. We prefer to have a certain number of fresh water for a number of reasons.

MS. RACINE: Why do you prefer?

ERIK HEIM: Again, because in our experience the fish perform better with the approach that we have. That doesn't mean that we cannot operate with other salinities, it's just a preference we have in our production.

MS. RACINE: Any concerns about using surface water and turbidity and how would you manage the turbidity with the use of the surface water?

ERIK HEIM: Okay. We have surface water use in other locations as well, so we have some experience with this. The same is the case in the California project we're working on, so this comes down to water treatment technology and this is a small quantity of water in the big picture, so.

MS. RACINE: When you say water treatment, are you referring to your filtration system and UV system, UV --

ERIK HEIM: We treat all of the incoming water, yes, regardless of the source.

MS. RACINE: And those are the two methods you're referring to?

ERIK HEIM: Huh?
MS. RACINE: The filter system and the UV treatment system are what you're referring to when you're saying you treat all water that comes in?
ERIK HEIM: All incoming water is treated regardless of source, yes.
MS. RACINE: And that -- those two treatments that I cited would address the turbidity?
ERIK HEIM: We can remove the turbidity from water, yes.
MS. RACINE: Dr. Neilson, sorry, Mr. Neilson, in fact, I wanted to ask you about the regulations, which I don't know if you're familiar, did you look at Section 375 of the Department's rules at all when you were making your assessment for the Site Location of Development Act?
THOMAS NEILSON: I'm not familiar with the specific sections --
MS. RACINE: Okay.
THOMAS NEILSON: -- and section names for the Site Location of Development Act, but we did review the site location.
MS. RACINE: You did review it in the course of... Okay. So applications for approval of proposed development here in Maine shall include

evidence that affirmatively demonstrates there will be no unreasonable adverse effect on groundwater quantity including information, which in areas where there is salt water intrusion the lowering of the groundwater level can be reasonably expected to be a problem a report by a duly qualified person addressing the potential effects of the groundwater use by the groundwater development. So salt water intrusion is one of those potential effects that the regulations require the applicant address in their application about groundwater. You stated that the hydrological investigation that was performed on Nordic's behalf suggested limited existing salt water intrusion at certain locations on the subject property; is that correct?

THOMAS NEILSON: That is correct.

MS. RACINE: You acknowledge that there is an inherent uncertainty associated with estimating condition changes within the complex fracture of bedroom aquifer; is that correct?

THOMAS NEILSON: Yes, that is correct.

MS. RACINe: And therefore a significant monitoring program has been developed and submitted as a required component of Nordic's permit application; is that correct?

THOMAS NEILSON: Yes, that would be the water resources monitoring plan.

MS. RACINe: So Nordic's SLODA application does not address the consequences of anticipated salt water intrusion; is that correct?

THOMAS NEILSON: We addressed the issue of salt water intrusion in a couple of ways. Salt water intrusion is a difficult topic to -- or a difficult process to model as Mike described, but in this case there is also considerable uncertainty in terms of how water actually moves through the rock. So it's fractured rock, water only moves through the fractures that are connected to the well that's withdrawing the water. So in this case, you would reasonably expect salt water intrusion to occur only in those fractures that are connected to a pumping well and the bay. In the way that we consider salt water intrusion we looked primarily or we looked firstly at how that might pose a threat to private water supply wells that would be impacted by salt water intrusion and we found that risk to be relatively low based on our understanding of the geology. And then the salt water intrusion that was already observed to occur, we put into the water resources monitoring plan a program to monitor that

salinity or we actually monitor conductivity as a surrogate salinity.

MS. RACINE: But am I correct in reading your submission as the salt water intrusion piece, you've said that will be under this monitoring plan but that the predictions were not actually presented in the application, that this is something you've -- that Nordic is comitted to monitoring in the future.

THOMAS NEILSON: No, there is significant limitations to predicting salt water intrusion in --

MS. RACINE: So there would be limitations, but is it possible?

MS. TOURANGEAU: Objection. You need to let the witness answer the question.

MICHAEL MOBILE: I can speak to the -- the ability to predict salt water intrusion having some experience in that area. I'll mention that the model is a fresh water only model. The practicality of trying to simulate water chemistry changes in a complex network of interconnected fractures within a fractured bedrock aquifer really it's -- it's a very, very, very difficult task to achieve especially when the data are not there to support that rigorous of a modeling effort. So the practical approach to assessing this condition going forward is to monitor

for salinity changes, as Tom alluded to, using surrogates. Those are appropriate and monitor the condition, set appropriate thresholds that may be indicative of trends in the direction of an adverse effect that are conservative and have actions in place to address those occurrences should those triggers be there.

MS. RACINE: So should those things happen, but -- and you say it's difficult to look at groundwater chemistry, it's not impossible.

MICHAEL MOBILE: It's extremely difficult to model variable density flow, density dependent flow where you have a migrating salt water/fresh water interface through discreet -- again, a network of discreet fractures that we've only really characterized that core whole level at select locations, so it's quite impractical to conduct a modeling effort like that for a site like this and provide meaningful projections that can be relied upon. What can be relied on is what we get from the model currently and what we get from the site from the hydrogeologic investigation, which gives us an indication that is something that we need to pay attention to and we're doing that just from the monitoring resources plan.

MS. RACINE: Okay. I don't think I have any further questions at this time.

MR. DUCHESNE: Great. I have received a signal from Ms. Daniels that you have a couple questions to ask. We would ask to you keep it brief and look forward to your remarks.

MS. DANIELS: Thank you. Very short microphone. Mr. Neilson, I wonder, are you aware that the Nordic requirements for fresh water exceed the total amount of water that's extracted from the three largest Nestle bottling facilities in Maine?

THOMAS NEILSON: I'm not specifically familiar with what the water requirements are of the three largest Nestle bottling facilities.

MS. DANIELS: Perhaps, Mr. Cotter, I'll ask you this. If yellowfin was grown in this facility as opposed to salmon is it actually true that it would require no fresh water to grow the fish as opposed to 20 percent fresh or 15 percent?

ERIK HEIM: Well, the best salinity to produce yellowfin kingfish is about 20 PPT, so we use fresh water and seawater. And the important point there is that yellowtail kingfish is a warm water fish so you are a much higher discharge temperature on that production.

MS. DANIELS: Higher discharge temperature --

ERIK HEIM: Yes.

MS. DANIELS: -- and less fresh water?

ERIK HEIM: We use about -- we have a higher salinity in the proposed farm here than we do in our Danish yellowtail kingfish facility.

MS. DANIELS: Okay.

ERIK HEIM: And the discharge temperature is because it's a warm water tropical fish.

MS. DANIELS: Okay. Mr. Neilson again, there are three wells on-site that were talked about in the southeast corner of the site and my understanding and perhaps you can tell me whether it's true that at least one of these wells is already known to be experiencing saline intrusion?

THOMAS NEILSON: Yes, the -- the well that we called GWW-103 already has a salt water signature in the chemistry of that water.

MS. DANIELS: Right. And when I was out on the site visit, I was somewhat surprised to find that all three of the wells that were pointed out were down in that area closest to the mouth of the Little River.

THOMAS NEILSON: The -- the wells extend

sort of roughly up along one of the streams that runs along the eastern side of the site, so they -- I wouldn't characterize them all as being down close to the Little River or towards the mouth of the Little River, but they are further towards the southeastern side of the side than the western side of the site, correct.

MS. DANIELS: Okay. Thank you. Thank you. Could you describe or any of you on the panel, you know, perhaps Dr. Mobile, could you describe what the longer term effects are of saline intrusion on both the aquifer and also on neighboring wells? What are the longer term -- I grew up on Cape Cod, so I'm really familiar with...

MICHAEL MOBILE: Well, again, as I mentioned earlier the modeling that we performed was a single density representation salt water intrusion was not specifically or explicitly represented in our modeling effort.

MS. DANIELS: Yes, I understand you didn't model for this.

MICHAEL MOBILE: Right.

MS. DANIELS: But I'm asking just the question as citizen what would the long-term effect on people's wells and/or the aquifer if you are

having a situation where saline is being drawn across these fractures and it's found already in one of the wells?

MICHAEL MOBILE: Well, again, you know, we don't -- we can't make predictions that are accurate at this point for this site because that will be really dependent upon what we see from the monitoring program that will be conducted. If you want me to speak generally --

MS. DANIELS: Yes, please.

MICHAEL MOBILE: -- about coastal Maine, that can be highly variable in fractured bedrock environments. I know of studies in the area and I'm thinking of a study that Bradford Caswell performed in the late 1970s looking at the Harpswell area where there were a significant number of bedrock wells that experienced no salt water intrusion despite being located quite close to the coast. There were a handful that did and it was mostly a function of some unique geology that contributed to that condition, so it can -- it can vary quite significantly. Bedrock is a fickle thing to deal with in some ways, so I can't give you a specific answer.

MS. DANIELS: Okay. Well, I know that, Mr. Heim, you have said to citizens and people in

that neighborhood that part of town that if there is a problem of insufficient water in their well that Nordic will help citizens to address that, but if there were a problem of saline in people's wells that also falls into a similar classification of affecting the potability of the water and I'm just wondering what Nordic thinks about that potential problem?

ERIK HEIM: I think we made a commitment that -- to maintain water quality for those who have wells and if there is any reason to believe that that water quality is impacted in the future that we have a guarantee that we step up and I think it was touched upon earlier to make sure we remedy that situation, which the situation is to give them clean water.

MS. DANIELS: What form did your guarantee take? I know that Maine has very old water laws, very -- they're one of three with the most antiquated water laws in the country actually and that the burden falls on the consumer, the individual well owner as opposed to the corporation or the industry to press suit -- to have the resources press suit or to pursue remediation of their well. What are your guarantees?

ERIK HEIM: Well, I think -- Ed, go ahead.

EDWARD COTTER: I think the resource monitoring plan that we've been discussing lays out our promise to the citizens quite clearly. It does talk about quantity. It also does address issues that might come up with quality and how we plan to address those in the future should that happen. Now, again, this is ignoring the fact that we have warning markers established in there to ensure that any changes are monitored and noted prior to impacts to neighbors.

MS. DANIELS: I am aware that you have identified a number of wells where you have some quantity monitoring equipment already in place to the north and northwest of the proposed location. Do you have any wells found in the south/southeast area of the proposed site that have any monitoring equipment in place?

THOMAS NEILSON: Yes, we -- we have monitoring equipment in place in the closest wells toward -- to the southeastern portion of the site and it's also worth noting that the water resources monitoring plan includes a proposal to collect water quality samples on a regular basis from all private wells that are in the water resources monitoring program and that goes in as part of the permit

requirements, so a failure to make good on the water resources monitoring plan represents a violation of the permit conditions.

MS. DANIELS: And who actually overseas the fulfillment of the water monitoring plan? I am unclear about that. Is that a function of the DEP?

THOMAS NEILSON: The DEP is responsible for reviewing everything that is done under the water resources monitoring plan and approving the key components of it.

MS. DANIELS: Mmm hmm. Approving the components of it. The monitors and -- and --

THOMAS NEILSON: The actual work that would be undertaken would be done by a qualified professional.

MS. DANIELS: Okay. I'm still not clear about if a consumer had a well problem, a problem with sufficient quantity or potability of their water who would they turn to?

THOMAS NEILSON: The issue of -- I guess, could you clarify sort of the hypothetical in -- in this case I think, you know, with the water resources monitoring plan somebody that Nordic contracted with, a qualified professional in the eyes of the state, would be conducting those water quality samples, but

are you asking if somebody notices it on their own who would they go to?

MS. DANIELS: Yes.

THOMAS NEILSON: I think that's maybe a question better directed to Ed or Erik, but my understanding is the third-party that's contracted by Nordic or to Nordic themselves, but I'll let them...

EDWARD COTTER: Our -- our plan lays out existing monitoring locations where we have contacted citizens and actually contacted citizens all over the area. Some have declined to be part of it, some have taken the advantage -- taken the opportunity to become part of it. We are currently finalizing that list and we will always be adding more as requests come in and are evaluated. So that the first thing is that if the person that -- in this hypothetical is included in the monitoring plan. The professional that's taking that data would know more about the water quality and quantity issues than the resident would long before and then that would be in our reports to the DEP. If it's somebody that is not on the plan, it comes down to them contacting us and letting us know about issues that they perceive, we would then use our third-party qualified contractor to review the situation and understand it and work

with the DEP if that were the -- the correct course to address it.

MS. DANIELS: Okay. Okay. My last area of questions here. Mr. Heim, have you discussed with the Belfast Water District the issues that I understand are probably going to arise if you are going to sustainably be purchasing 263 million gallons of water a year from the water district from the Goose River aquifer? I was at the public meeting where the Belfast Water District indicated that they were going to bring the Jackson Pit Well online and that there is some kind of problem that I can't really describe myself not being a hydrogeologist, but where two of the wells up in the aquifer impinge on each other and that some remediations have to happen to it. And also I also wanted to ask whether it had been discussed what would potentially happen now that you are planning to draw 4 or 500 gallons per minute over four miles of 100 year old pipes, four miles being from Goose River down to your proposed facility. So the night of that planning board meeting it was said that the increase in the sale of water to Nordic would cover those issues that needed beefing up or repair or rebuilding, however, when I did the math I came out with $750,000 in water

purchase versus $2 million is what the Belfast Water District said that they needed in order to get that amount of water down to your facility.

EDWARD COTTER: I'm going to answer that because I've been in more touch recently with the parties in this. In general, we note that the Belfast Water District has received approval from the state to sell this water to us as proposed in our agreements. When it comes to the infrastructure upgrades that you mentioned the thing you need to realize is that the two and a half million or whatever that number is that might need to be spent would be a bonded infrastructure upgrade that would be spent and reimbursed to the state over 30 years, 40 years, the life of the upgrades. That 750,000 I think you quoted that we would be paying for that water is every year. So obviously that amount of money would greatly surpass the amount of the debt service that is required for those upgrades.

MS. DANIELS: Okay. Thank you.

MR. DUCHESNE: Thank you very much. Good line of questioning. I believe we can proceed to DEP and Board questions, so who wants to go first? Mr. Hopeck, would you like to --

DR. HOPECK: Unless the Board wishes to go

first.

MR. DRAPER: I do have one.

MR. DUCHESNE: Well, okay, we'll go to Mr. Draper first.

MR. DRAPER: Dr. Mobile, and maybe I'm just asking for clarification. I think I understood that you said that the entire volume of fresh water that would be needed for this project could be -- could be supplied by surface water by the -- by the lower impoundment; is that correct?

MICHAEL MOBILE: I'm going to refer you to Mr. Neilson, he's the one --

MR. DRAPER: Maybe I have the wrong -- the other doctor.

(Laughter.)

MICHAEL MOBILE: The posing Dr. Neilson.

THOMAS NEILSON: So what I -- what I intended to say and I think what I didn't say was that during much of the year the Little -- the flow of the Little River is equal to or exceeds the total fresh water demand of the project. The challenge with using a surface water supply as your sole source would be surface water rises and drops very quickly. It -- it is not necessarily a consistent supply and so it would be challenging to rely on it from a

quantity point of view and it does present some additional treatment that needs to be done relative to groundwater. So it is very useful and a very important component from a balance perspective in terms of the fresh water supply system, but it is not well-suited to being the -- the sole supply.

MR. DRAPER: So you answered my follow-up question is why the other source, so thank you very much.

MR. DUCHESNE: I'll go to Mr. Martin.

MR. MARTIN: Thank you. I've got a feeling Dr. Neilson might be going more into the weeds than I am, so I'm going to try to keep it a little more summary surface level to start. So from my understanding is that the plan is providing somewhat of a prediction here and the water resource monitoring plan is meant to confirm those -- that analysis; is that correct?

MICHAEL MOBILE: The model?

MR. MARTIN: Yes, the model.

MICHAEL MOBILE: Yes, so the model is providing that estimate and, yes, the water resource monitoring plan -- packing up that estimate with monitoring to basically verify the prediction.

MR. MARTIN: Sure. So to confirm, which is

following up a little bit on Ms. Racine's questioning, but getting back to the standard, can you describe kind of your analysis under that unreasonable risk to groundwater quantity standard under the Site Law, how is that process done and kind of connect that into a summary of the model?

MICHAEL MOBILE: Sure. So relative to quantity what the model has done is, again, I -- in my summary I described how the model has sort of these three pieces of support, right, the model estimated quantity of drawdown or a change in water level, the rates at which those drawdowns develop and stabilize and then this general assessment of where the water -- where the groundwater is coming from. So going back to those first two points that's where we see the real quantity evidence coming in in terms of the model. So what we see is that when we simulate that 455 gallon per minute scenario from the three site wells, we do predict some drawdown, but that amount of drawdown is relatively small and mostly focused on the site. When you get off-site in the positions of wells, private wells that are in current use, that amount of predicted drawdown is not something we feel would -- would put those wells in a challenging position. Of course we need to monitor

that, right, and understand that indeed if those changes start trending in a direction that's different from what the model is predicting then there needs to be action taken. But effectively that's how we look at, you know, the model simulation is being an assessment of water availability, you know, pretty specifically to the -- or one particular area of interest is the private wells in the area.

MR. MARTIN: Sure. Is it -- is it accurate to say that the value that you've come up with, is that a maximum amount that can be or is that --

MICHAEL MOBILE: No.

MR. MARTIN: -- safely?

MICHAEL MOBILE: No, I think there is -- it's sort of a gray area. What we do see is that we're using wells with that -- that particular scenario and I want to step back for a moment. So when we simulate these different scenarios, we're picking groups of wells and rates that align with specific periods of data collection within the hydrogeologic investigation. I mean, there were -- there were four independent pumping tests were conducted as part of this current image that were a really pretty amazingly extensive effort. And one of those final tests we had stages where the pumping was

ramped up, initial wells were put online, but at one stage we had the three wells that we're proposing pumping at a rate of 455 gallons per minute. So we have a chunk of data that represents the actual pumping conditions. There is a short period of time we have some data there. We ramped it up and we added other wells on. We started seeing effects that weren't particularly attractive that were things we wanted to avoid, for instance, pumping from the northern part of the site, we did start seeing hydraulic effects that were extending on the other side of the river, we wanted to avoid that to not put the wells in that -- the private wells in that area, you know, a potential area of competition with the site pumping. So we've used a substantial amount of data to sort of verify this model and produce simulated results for a bunch of different scenarios. We see different effects in each, but it's not that 455 gallons is going to hit some hard wall. It's the quantity of drawdown that we see in that particular scenario, which we think is manageable and we also think that the conditions are relatively easy to monitor, you know, in association with that pumping scenario.

MR. MARTIN: Okay. So would it be accurate,

I guess, to define those numbers and say that that does not cause any sort of unreasonable risk, is that where you're coming from with that -- with that particular number? That's what I am trying to get at is does that --

MICHAEL MOBILE: Yeah.

MR. MARTIN: -- what you're saying there?

MICHAEL MOBILE: Yeah, in terms -- what the model is suggesting is that that pumping rate, again, it's many pieces that flow into it, right, it's our -- what I view as a conservative representation of the recharge rates within the system, it's the model as a whole, but what we see is that, yes, under that particular pumping scenario long-term drawdown is slow to develop, can be monitored and we don't see quantities of drawdown that present an obvious issue or obvious adverse effect to private supply wells. Of course, it all has to be proven through monitoring, right, but that's effectively where we sit, yes.

MR. MARTIN: Correct. That's -- I understand that portion. I guess what I'm trying to get at is before you can prove that the modeling is -- the monitoring is going to -- what is proving? Is it proving that the model says this is unreasonable,

that's what I'm trying to get at.

MICHAEL MOBILE: That's an accurate description.

MR. MARTIN: Okay. Briefly, and this might be to you or Mr. Neilson, we've referenced elements of the plan and, sure, the model and salt water intrusion, is it -- can you speak to what elements were meant to kind of summarize whether there is an unreasonable impact due to salt water intrusion? Can you just -- and I know that wasn't particularly part of the model, but I guess what is there in this model that is touching on this issue?

MICHAEL MOBILE: Right. So from a modeling perspective, again, just to remind everyone that as you know the model is a fresh water model only. It does balance the sources of groundwater within the system versus the losses or the avenues for sinks -- avenues for loss of groundwater. We simulated the model without pumping, then we add the pumping in and those sources and sinks rebalance and that rebalanced environment what the model shows is that what we're representing is the coastal boundaries, the interface between the fresh water system, the fresh water aquifer and the coastal system, the saline condition. We see that the passage boundary that we use there

actually does produce some inflow to the model where it wasn't in the non-pumping condition. Again, this model is a simplification not only of the bedrock system that is a fractured system, we don't explicitly represent the fractures that we have a significant control on avenues of salt water migration inland. But for the moment, we're not simulating water chemistry changes explicitly, so any indication from the model of that water balance is that this is, again, as I put it earlier this is something we should keep our eye on. This is something that's relevant in this particular case, but from the modeling perspective there is no, you know, explicit evidence that salt water intrusion will occur and I think Tom can talk about also what we see in terms of data that reflected during the hydrogeological investigation.

THOMAS NEILSON: Yeah, so with regard to the salt water intrusion what we see in the data as we turn on the pump in the well that already has the salt water signature in it, depending on the time of year you'll see a different response in the kind of activity in that water, so in times of the year where there is it significant recharge to the aquifer you'll be getting more fresh water coming down

towards that coastal boundary and you don't really see a change in connectivity of the water in that well when it's being pumped versus in dryer times of year when there is less fresh water coming down through the aquifer you have a little bit of a rise of conductivity during the pumping. You know, from -- from what we can infer from the data that we have the -- the salt water intrusion -- or salt water intrusion if it's to occur is likely to be pretty limited in area. It would be limited to the fractures connected -- that connect that well GWW-103 with the coast. We don't see any hydraulic responses between that well and private wells, so there is no indication that there would be a salt water condition developing in any of the private wells that we were monitoring. So from -- in that aspect we -- we have -- do have some idea of what to expect from salt water or potential for salt water intrusion, but -- and it doesn't indicate a risk to private water users.

MR. MARTIN: Sure. And one last question and I'm happy to send this also to tomorrow to the stormwater experts, but can you briefly kind of describe to what extent the diversion on the northern part of the property would affect your model or it --

it obviously wasn't considered in the model, but I guess I'm trying to get a take on how that's going to affect groundwater south of that diversion and what you did model?

MICHAEL MOBILE: Referring to the stormwater management would occur?

MR. MARTIN: Yes.

MICHAEL MOBILE: Yes. Yes, I can comment on that. First and foremost, the area contributing recharge to the proposed supply wells is much greater than the area being disturbed under construction, so I don't think it's fair to just look at, you know, the site area and changes there as having a definite direct influence on the recharge that these wells currently have. Beyond that, again, the nature of the current deposits is such that the amount of recharge occurring directly in that site vicinity is relatively low. When I say that recharge is recurrent in our technical memorandum when I say that recharge is the primary source of groundwater to these wells it's not just the water that's raining on top raining down onto the site, it's coming from other areas that may be diverted from what was, you know, discharging in previous simulations without pumping to surface water featured ultimately making

its way to these -- its way to these wells in the pumping scenarios, so. And the other factor too I want to mention is that we did, again, test sensitivity to the amount of recharge that we're applying to the model even in the site area by doing a reduced recharge scenario and we saw limited sensitivity. So we have an assessment that says there isn't a huge amount of sensitivity to that particular condition.

MR. MARTIN: Okay. And that factors in, I guess, what I'm talking about more is not necessarily impact from impervious surfaces on the site, but my understanding of the groundwater in -- in the area generally is flow is from north of the site towards the Little River; is that correct, or is that...

MICHAEL MOBILE: Yeah, I think locally that's accurate.

MR. MARTIN: So would any sort of diversion from stormwater impact -- it's obviously going to have to travel through the site, is there any impact there that's what I'm trying to get at.

MICHAEL MOBILE: I would have to think about that question a little bit more. I am not sure -- I mean, I recall that the wells that are being proposed are drawing from the fracture of bedrock aquifer,

that north to south flow condition is more descriptive of the shallow groundwater system that, yeah, I'd have to -- I think I'd have to put a little more thought into that question to give an accurate answer.

EDWARD COTTER: One of the items that was mentioned earlier was the fact that there is a diversion at the north end of the site that takes stormwater from north of the site into roads that are on the site to different locations where it's discharged. That's not unlike what's happening right now. At this time, the water north of the site ends up in drainages and other places where it ends up flowing into the Little River the way we propose it. So it's not to say that we're stealing groundwater, this is surface water that mostly remains surface water. The other thing is the diversion is not preventing water from that -- that stormwater from going into the ground the way it would anyway. It simply takes whatever doesn't go into the ground and diverts it around the site and through structures.

MR. MARTIN: Thank you. That's very helpful.

MR. DUCHESNE: Dr. Hopeck, you probably have a good opportunity to ask questions that we might

have thought of but couldn't put in the best words possible, so we'll put the pressure on.

DR. HOPECK: What I guess I'll start with doing is some questions that we probably both know the answer to but may just elucidate things a little bit for the Board that a model by its nature is it's finite, you can't capture everything. And so if I look at -- at the boundaries that you have and I'm going to try to summarize some things and please just jump in if I'm oversimplifying or leaving something out.

MICHAEL MOBILE: Okay.

DR. HOPECK: That if we look at the model you have for the on land parts you have essentially put a no flow boundary at more or less the topographic divide of the watershed, correct?

MICHAEL MOBILE: Exactly.

DR. HOPECK: And would it be correct to say that that is for the purposes of the model, and again things behave differently, but for the purposes of the model it's essentially an impermeable wall.

MICHAEL MOBILE: That's accurate, yeah, no groundwater in model space can flow across those boundaries, that's right.

DR. HOPECK: Okay. So on the ocean side

then you do have a section that allows some leakage from the marine environment back into the --

MICHAEL MOBILE: That's right. In the uppermost layer of the model we simulate a passing condition called a constant head boundary where we called -- we defined the head condition in that layer as a fresh water adjustment.

DR. HOPECK: So the idea would be that that is a reservoir essentially and if the water level within the adjacent parts of the model drops below that water will then flow across that boundary into the modeled area; is that correct?

MICHAEL MOBILE: That's accurate. Yeah, so in the non-pumping condition water flows out to it is how our condition is above it with potential going out towards the ocean. The opposite happens to a small degree in the pumping scenarios and pulls it back in.

DR. HOPECK: So that is really the only boundary that we could have water coming into the model from outside?

MICHAEL MOBILE: No.

DR. HOPECK: I mean, we have precipitation on the top.

MICHAEL MOBILE: Right. And the way to

represent the reservoirs, yes, there are other internal representations that can provide groundwater to the system.

DR. HOPECK: Okay. I'm thinking in terms of the box -- the big box being --

MICHAEL MOBILE: Peripheral boundaries, you're right, yes.

DR. HOPECK: So then we have precipitation onto the model surface that leaks down to groundwater or becomes variably surface water in some form and remains a surface water and flows in and out of the groundwater system --

MICHAEL MOBILE: Correct.

DR. HOPECK: -- at some point. So that's really our two sources of water for this simulation or whatever leaks across that marine boundary and the precipitation onto the surface.

MICHAEL MOBILE: Well, again, those internal sources or sinks of water have some influence. We do induce some leakage from the reservoirs, for example, when we run the simulations it's not a huge component of the volumetric balance but those, you know, those features are able to provide groundwater to the wells, for example.

DR. HOPECK: Right. But before we get down

to that granular point --

MICHAEL MOBILE: Okay.

DR. HOPECK: -- that we had the -- is the no-flow boundary is the topographic boundary, right?

MICHAEL MOBILE: Right.

DR. HOPECK: And simplifying the assumption that precipitation that falls on there stays within that boundary --

MR. DUCHESNE: If I may just interrupt briefly --

DR. HOPECK: Yes.

MR. DUCHESNE: -- I can see some difficulty hearing in the back --

DR. HOPECK: Okay.

MR. DUCHESNE: -- so if you can pull the microphone a little closer and speak up.

DR. HOPECK: How is that?

MR. DUCHESNE: Great. I apologize.

MICHAEL MOBILE: Am I quiet too?

MR. DUCHESNE: Yeah. Just to make all those people back there happy.

DR. HOPECK: Okay. Is that good for people? Okay. So once we get that then we have a series of -- we have water that flows straight through the system out to the ocean, we have water that sinks

down to the deeper part of the bedrock aquifer, we have water that may go in and out of the overburden --

MICHAEL MOBILE: Correct.

DR. HOPECK: -- sometimes going into surface water, sometimes going out, but it's basically a box with a finite sum of -- a finite flow of water through it.

MICHAEL MOBILE: (Indicating yes.)

DR. HOPECK: And so I guess what the -- the a point I'm sort of trying to clarify to the Board is that what we're looking at here is how that volume of water is distributed within the system. That is to say that water which would stay in surface water the whole way and that water which would flow in and out of shallow groundwater systems to surface water back to groundwater and so on and so forth, that water which was -- in cases where the water level -- and, again, please jump in if I am oversimplifying here -- in cases where the water table is relatively high might stay wetland, but if the water table is lower it might sink through the bottom of that but given the overburden here we're dealing probably in a case where a lot of these wetland systems are perched, but just in general.

MICHAEL MOBILE: That was one clarification I did want to make was, you know, the nature of the -- the unconsolidated surficial deposits in the vicinity of the site definitely does tend to produce perched conditions in local areas, so that's -- that's not to be unexpected that you might have a perched wetland.

MR. DUCHESNE: Could you just explain for everybody, including me, what perched wetland is?

DR. HOPECK: Well, I'll --

MS. BENSINGER: Actually, the witness should testify, not Mr. Hopeck.

MICHAEL MOBILE: I'm happy to do so. Effectively, it's where you have a water feature that is disconnected from the water table or the saturated groundwater system and so you think of a high and dry wetland where the water table is not meeting that wetland in a hydraulic connection in that situation that would be a perched condition.

MR. DUCHESNE: You may continue with your questions.

DR. HOPECK: Sure. And so then the -- so to tie back to that then, the places then where we would have potential for losing water from surface water resources such as streams and wetlands for -- you

know, from sort of an interflow system where the water goes back and forth, those would be the areas where we would be looking at drawdown being significantly below the present pre-pumping water table.

MICHAEL MOBILE: The hydraulic condition is drawn down, yes, on-site within the fractured bedrock aquifer, yes.

DR. HOPECK: Okay. And that -- that area occurs under the Little River and in this case that molten is the area underneath the Little River near the facility and also out into the intertidal zone.

MICHAEL MOBILE: That's correct.

DR. HOPECK: Okay. So I think something that I'm worrying, I guess, about this process is that your -- at all stages of the life of the fish they can tolerate, did I hear, up to 20 percent part per thousand salinity?

ERIK HEIM: Salmon is produced up to pure seawater level, so 35 PPT.

DR. HOPECK: For the adults, but that's just for --

ERIK HEIM: Well, yeah, most of them are farmed in the ocean, so they can produce in pure seawater. We prefer lower levels in our systems, but

there is a range that you can produce them in.

DR. HOPECK: Okay. So I guess we've been looking at numbers at this 455 and 500 so far as maximum members, is that correct?

MICHAEL MOBILE: In terms of aquifer groundwater yield, yes --

DR. HOPECK: Yes.

MICHAEL MOBILE: -- that's right.

DR. HOPECK: And from what I've heard you say so far that it's possible to operate with substantially -- not substantially, that's not correct, but with lower volumes of water demand?

ERIK HEIM: Yes, we prefer to keep the PPT range lower. There is a lot of benefits in production, but we have some leeway and flexibility in terms of increasing or decreasing salinity levels in the system. So what we are doing is targeting what we believe is the optimal range and that's basically the basis for the water mix that we are proposing in the project.

DR. HOPECK: And so do you have an idea -- a ballpark idea at this point of what percentage of that maximum you might be talking about at full build-out operational normal condition?

ERIK HEIM: We -- we are targeting for this

project an upward boundary of about mid-20s in PPT in production. Some of the fresh water is exclusively going to production while some of the seawater is going to cooling systems and other things, so we have some ability to regulate this and the water mix in different parts of the system. But we'd like to be no higher than the mid-20s of PPT if we can.

DR. HOPECK: And in volume in gallons per minute, what are we talking about?

ERIK HEIM: For what?

DR. HOPECK: For -- well, I'm saying if you don't need to use -- if you can operate with less than the 455 gallons per minute from a well, less than the 500 gallons from the water district, less than the 70 from the reservoir, what -- what kind of is the more normal operating condition number?

ERIK HEIM: So the point of having multiple water resources is to have redundancies, right. So if there is a complete increase in all water sources then we have to do some reconfiguring of the system to -- to account for higher salinity levels, but at this time we're not accounting for every water source being reduced. At least some will be able to produce what has been predicted and if there is an impact of one of them we have some redundancies to be able to

adjust.

EDWARD COTTER: I think our normal operating status is not to run at a maximum on all three sources at once. We expect to run a much lower source -- much lower capacities on certain sources knowing that those are there as our back-up. As Mr. Heim was just noting, the switch over to higher salinities can certainly happen for certain systems, whereas other systems maybe we wouldn't -- if we knew that we had a long-term situation we would not be starting new fresh water fish processes until that situation was resolved.

DR. HOPECK: Do you have an idea of what that number would be in gallons per minute?

EDWARD COTTER: I don't have those calculations in front of me and the engineering that looks at that has looked at all those situations. They're very familiar with our limitations on the site and our capacities on the site and I can say with confidence I've had those conversations that the production team and engineering team understand those and have designed the system as such and I do not personally know the gallons per minute of different situations. You know, it is a biology situation where we don't have machines that put out 60 widgets

per minute. It's a very highly variable situation, so there are hundreds of different situations and that's why the flexibility and resiliency is so important.

DR. HOPECK: Okay. So that -- so we could anticipate an operating condition that would be less than the full posed maximum yield, but you don't know how much yet?

EDWARD COTTER: Correct.

DR. HOPECK: Okay. And from what I'm hearing is it true that you would be able -- during the pumping test we saw some increase in conductivity in that 103 well you could tolerate up to about how much?

EDWARD COTTER: We could certainly tolerate an increase in conductivity or salinity in that well. It's not a concern for our operations, but it's going to be more of a concern of monitoring the situation and making sure that none of the limitations or limits in our monitoring plant are being exceeded.

DR. HOPECK: Okay. So I think that gets us -- that gets us to the monitoring plan, which is sort of the hinge of this whole thing and there are a lot of issues --

MR. DUCHESNE: Once again, I'm getting

signals to up the volume.

DR. HOPECK: Okay. The monitoring plan I think we would agree is sort of critical to the whole principle --

MICHAEL MOBILE: Absolutely.

DR. HOPECK: -- and you have a fair bit of work to do on that yet. Do you have based on the recent information you have or do you have an idea when in the future you might be submitting a revised monitoring plan?

MICHAEL MOBILE: Tom?

THOMAS NEILSON: I -- I'll -- I think this is sort of -- yeah, maybe you're better off answering it.

EDWARD COTTER: The understanding we have right now is that we are actively talking with residents that want to be on this monitoring plan that aren't currently, so Mr. Neilson is maintaining a list of potential add-ins to that plan. It was our understanding or our intention to understand what the requirements are from the Department where we may have -- maybe don't have something listed that's important. We know that we've had recent correspondence from you that indicates additional frequency and we're certainly looking forward to

having a set of conditions that would satisfy those requirements that you have added recently.

DR. HOPECK: Okay. So the -- sorry.

EDWARD COTTER: Oh, what we would look to do is to start monitoring as soon as those conditions are established so that we can set up a very robust pre-condition analysis and that way we have a good baseline. Construction as it was mentioned in earlier testimony, the first phase has about two years of construction. Somewhere in there we're going to be starting some low level operations, so that gives us at least 12 months of monitoring data plus the monitoring that we have been doing for certain parameters over the last year or plus since we started this operation. And then we have a ramp-up condition where we're going to propose to start our operations with our smolt facility. It uses a very small portion of the overall water profile so that gives us a nice ramp-up monitoring to check reactions against the model. So we're looking at two years plus of data before we even hit full operation for just Phase 1.

DR. HOPECK: So looking at, again, going back to where -- where the water comes from on the site, some of it critical resources would be surface

waters --

EDWARD COTTER: Mmm Hmm.

DR. HOPECK: -- and we don't at the moment have -- is it true we don't at the moment have continuous data recording from any on-site surface waters?

THOMAS NEILSON: That's correct. We have continuous data recording in on-site groundwater wells, but we don't have continuous data recording occurring in the surface water. We are positioned to begin that more or less immediately, but we are not currently doing that.

DR. HOPECK: Okay. And with regard to the water from the Belfast Water District, that's up to 500 gallons per minute or roughly 1 point something CFS, I think?

EDWARD COTTER: Yes, 500 GPM is what they have indicated is their capacity for us.

DR. HOPECK: Okay. And given the connection between the Goose River and the aquifer, do we -- it's mentioned that there are data from the Goose River that we don't have a sense yet of what the minimum flows in the Goose River would be?

THOMAS NEILSON: So we -- we have -- we'd like to discuss, I guess, more with the water

district to get them on board with whatever current monitoring they're doing and how additional monitoring if it -- if the Department sees that as necessary would take place. So we -- we are very open to having further discussions about how that might look and what that would require in terms of monitoring for the Goose River as well.

DR. HOPECK: And for the wetland systems, again, to get this back to the idea that we have broached before to the extent to which these wetlands might be perched there is or is not in place at the moment something continuously monitoring shallow groundwater levels?

THOMAS NEILSON: I believe that we currently have transducers set and a couple of shallow piezometers, but I would have to double-check that list of equipment that's been left in place on the site, but we do -- we do currently have shallow piezometers that you may or may not recall from the report a couple of them are installed in the Presumpscot in the -- in the weathered bedrock fill beneath that and if I remember correctly at least one of those pairs has transducers in it currently.

DR. HOPECK: Okay. So those have remained in place.

THOMAS NEILSON: Yeah, all of the -- all of the monitoring points that we used during the hydrogeologic assessment are still in place. There has been -- I think the only instance of damage was the gauge we used in the Little River, the free-flowing reach where ice took out the distilling well for the transducer.

DR. HOPECK: And you are working with people on bedrock -- on getting the bedrock -- certain bedrock wells into the program as well?

THOMAS NEILSON: Yes. There is -- there is a plan to install I believe it's two additional bedrock wells, if I remember correctly, from the water resources monitoring plan. That would be sort of background bedrock wells and the -- along the southern border of the site.

DR. HOPECK: Okay. That's all I've got right now.

MR. DUCHESNE: Thank you very much. I believe Mr. Parker buzzed in first.

MR. PARKER: Most of what I was going to ask I think you've hit on one way or another and I just want to follow-up a little bit. First of all, as I understand it, the Belfast Water District had some wells on-site and one of them has shown some fallacy

for intrusion in the past; is that right?

THOMAS NEILSON: I'm not aware of any wells that predated our investigation the site.

MR. PARKER: Okay. It may be -- it may be an off-site that you were talking about were you've seen some intrusion.

THOMAS NEILSON: There is -- there is a well that we installed on the site as part of this investigation that does show some indications of a currently existing -- some extent of currently existing salt water intrusion, yes.

MR. PARKER: How -- how hard was that well pumped?

THOMAS NEILSON: During our pumping test that well was pumped at 175 gallons per minute, which is similar to the proposed withdrawal under the, um...

MR. PARKER: Okay. Now, you have some other wells proposed on-site, do you need that well to meet your underground water or do you have enough other wells away from that particular well to provide your groundwater?

THOMAS NEILSON: The -- the groundwater from that well is important for the total mix. What we -- in the course of the investigation we found that, as

Mike talked about a little bit, pumping from the northern part of the site tended to create a condition that had a potentially negative effect on private wells. It was in a different fracture set and so what we've done is we've shifted the proposed wells toward the south which includes this well specifically to avoid having any -- specifically to avoid the risk of adverse impacts to private wells, so this -- this well is an important part of the groundwater mix, correct.

MR. PARKER: Okay. Now, one of the other things that I'm having trouble understanding, I guess, is you take from the Little River source and you go to 10 percent of the drought flow and you've got roughly 250 gallons a minute available. You've got 455 gallons a minute available from wells on-site presumably and we'll draw into the safe factor and you've got 500 gallons available from the water district, but no one has ever said how much water you actually think you need. Do you have a number of what you need at build-out?

EDWARD COTTER: Our -- our goal is to understand the conditions of the site, understand what a -- the safe withdrawal limits are and that's what we're targeting towards hitting with our

operations. So we need -- we plan to go at this to look at what is available and we design our systems around that and we operate our systems around that rather than simply stating what we need and then figuring out if we have it. So we target our operations to meet -- to stay below these proposed limits and that's how much we have available to use. At different times we'll be using different amounts. Mr. Heim mentioned that there is a target salinity we would like to maintain and at most times we think that we will be able to maintain that based on what's available through the numbers that you just mentioned. Other times we'll use less if that's what the -- what the resources indicate.

MR. PARKER: Okay. I guess I'm still as confused as I was. The amount of water that you're going to use in your facility is going to depend on the amount of water you can find, is that what you're saying basically?

EDWARD COTTER: Well, it's based on the balance between salt water and fresh water. So the salt water at this site greatly --

MR. PARKER: I'm talking just groundwater or fresh water right now.

EDWARD COTTER: No, I understand that, but

the way we're operating the salt water greatly dwarfs any fresh water requirements and that's -- that's the basis for our operation is the salt water. The fresh water requirements are simply added to bring the water salinity to a mix that's -- that's right for us for our operations, so that's why if -- if we needed to use less fresh water for certain periods that is available because we're still operating on the salt water.

MR. PARKER: Okay. If you did run short on salt water or fresh water, I see you've got an agreement for 500 gallons a minute from the water district, have you discussed potentially more from them if you need it?

ERIK HEIM: So I guess this might be helpful to just clarify. So the smolt phase of salmon is all fresh water and that's a fairly moderate use, the fresh water that goes into that. And then you go on to the so-called grow-out phase and that's where we have more flexibility on salinity levels. So what we really set is sort of a range of salinity levels that we'd like to be able to operate within and that's also what gives us some operational flexibility. So the fresh water target gives us sufficient water to be very comfortable to be operating within the range

which also means that we can potentially reduce that in the future if we -- if we see that -- that operations can proceed with a lower or higher salinity level without problems, but we would -- we don't want to try and start at that point. This is optimization of the systems over time and that's why there are buffers in there that we need to be comfortable in addition to the sort of redundancies that we have on water sources so we can shift use between them if we see an impact one place that we don't want. As for the water district, just one comment, so this property and the agreement was conditioned on agreement with the water district. So they wouldn't actually sell us the property without this water agreement.

MR. PARKER: Understood.

ERIK HEIM: So I say what happens, you know, down the road if we don't need this water, well, you know, that's part of the agreement. That's -- that's how this started. We did not ask for this agreement. So I just want to make that clear this was a condition from Belfast put upon us, okay. So what we've done basically is that we -- we went into the agreement and the water district has written I think a quite extensive paper -- a memo on this issue

explaining how traditionally it uses quite higher levels of water than they currently do with our agreement, so they have been clear that they have excess capacity well beyond us as well. So what we have done is we have actually gone down on the initial assumptions on groundwater and shifted some of that over to the water district. That means more revenue from the water district and more funds for them to upgrade infrastructure.

MR. PARKER: Okay. So you do have a real back-up position if you need it?

ERIK HEIM: Yes.

MR. PARKER: Would there be a tendency during high seasonal flows and stuff or would pre-treatment preclude that of drawing more of the surface water in through the well water or would you have more pre-treatment to acclimate the water?

EDWARD COTTER: It would be more pre-treatment. We plan to built the infrastructure to be able to do that when needed, but it's a design -- it's not the most desirable operation for us, but we do understand that it's an important element in our plan to be ready for that.

MR. PARKER: Okay. Thank you.

MR. DUCHESNE: Thank you, Mr. Parker. I'll

probably just go around the corner unless there is a really pressing question, but I can go to Mr. Sanford. Because I'm willing to auction off the next question --

(Laughter.)

MR. SANFORD: Too late.

MR. DUCHESNE: -- with bidding at $1.

MR. SANFORD: Too late, it's right here. So in doing these models for groundwater, these mathematical models, they assume generally historic conditions and geologic stability and although I understand there can be some topographic changes, but there are some climatic factors and given that some climatic factors appear -- we appear to be in a state of more robust change for that and I understand that you've got monitoring and that you've got a certain amount of robustness, but do those also contemplate a change in the water regime as a result of climatic factors changing?

MICHAEL MOBILE: Yeah, so the way we chose to handle that particular situation was to run the sensitivity test that I mentioned earlier. We specified the amount of recharge that comes into the model that's basically water that occurs at the surface and infiltrates and becomes ground water. We

formed the model initially based on studies of Maine -- studies conducted in Maine that pertain specifically to the types of deposits that occur within this model domain. We took the average of the ranges from those studies and then we halved those recharge rates, we cut them in half and ran another scenario, four looking scenarios, so we were able to assess the general sensitivity of the model predictions to a reduction in that recharge as a way of a conservative look at potential climatic shifts if there were to be less recharge available. That's not to say that that's necessarily consistent with what literature says that climate change is going to bring to this region, but it's a way to look at conservatively what happens if, you know, one of the biggest sources of groundwater does change in a way that isn't particularly favorable.

MR. SANFORD: Okay. Thank you.

MICHAEL MOBILE: You're welcome.

MR. DUCHESNE: I'm going to go to Ms. Lessard next.

MS. LESSARD: A couple questions. First, Mr. Neilson, in your -- in some of your testimony you stated that the existing fresh water demand of the facility could be satisfied by surface water for

extended periods of time. How long is an extended period of time and under what circumstances might that be necessary?

THOMAS NEILSON: So I think it's not necessarily extended periods of time that it would be satisfied for. It's for a large portion of a given year. The Little River would flow at a rate that is higher than all of the other fresh water sources combined. So surface water flows can increase quickly, you know, if you use a flood as an example flood waters may rise very quickly and recede very quickly, so it's not necessarily that that -- that the Little River could be relied upon to flow at some given number for a certain period of time. It's that if you look at the sort of hydrologic characteristics and the statistics of discharge from that watershed generally you can expect a large portion of the year for that flow to exceed the demand of the -- of the facility. And so what that means from a -- from sort of a surface water intake perspective is all that extra water coming down the river does what it normally does now instead of being diverted into an intake pipe at the dam it would flow right over the dam and into the bay.

MS. LESSARD: Okay. Thank you. And I am

assuming that there is some hierarchy of preferred water use here. You didn't -- weren't going to buy it from the District except it's part of the deal and there is groundwater and then there is the surface water, I would imagine there is a hierarchy in how you're going to approach use of that water in your system because sort of trying to mix all three I would think would create some chemistry problems in treatment.

EDWARD COTTER: There is. There is a hierarchy in our preference. There is also several different systems in the proposed facility, so we know that we're going to use Belfast Water District the way every other facility does, that we're going to flush our toilets with their water, we're going to use their water in our processing facility, we plan to use their water in other more standard operations. That water has chlorine that needs to be treated in order for us to use it with fish operations. We have some operations such as, you know, the early life stages that are more sensitive so we would prefer not to use that dechlorinated there because it's not the best profile. Groundwater is the preference. We like groundwater, it's clean, it does not have chlorine in it, it doesn't have high silt or

turbidity, so that's our preference to use for most of the fish rearing operations, but we would prioritize that towards the early life stage cycles in the smolt building. And then the -- the Little River, we've mentioned it's a little bit unpredictable. It also has high turbidity and biological components that we will need to treat -- that that takes time, it costs money, so that would be our third preference. It's all systems that we're able to use, but you're right, there is definitely a preference.

MS. LESSARD: So for the fish rearing piece --

EDWARD COTTER: Mmm Hmm.

MS. LESSARD: -- it's primarily your first preference is groundwater and seawater --

EDWARD COTTER: Correct.

MS. LESSARD: -- obviously from --

EDWARD COTTER: From the bay, yes.

MS. LESSARD: -- the intake. So I guess the question is because there has been a discussion here of how much and it -- I would assume you know the salinity level of the water that's going to be coming in from the bay?

EDWARD COTTER: Yes.

MS. LESSARD: And what that mix needs to be with groundwater in order to know how much of that you would need to get to what I think was referred to your optimum salinity.

EDWARD COTTER: Mmm Hmm.

MS. LESSARD: The wells that have been identified -- because I'm trying to understand how much you need. You must have some idea and I've -- you've said, well, it depends on how we -- there must be a baseline to get to the appropriate salinity level in there -- in combination with the smolt, which don't need any at all. So I guess what most people want to know is what's the number? I'm sorry, I just...

ERIK HEIM: Can I just comment, Sue?

MS. LESSARD: Sure.

ERIK HEIM: So that's -- you're bringing up another important -- in the salinity levels in the bay does raise it too and that's yet another variable that we put into the mix here, right. So there is a lot of variables that are being monitored in our production will be we want to be able to make adjustments to maintain a stable salinity in the short-term. In the long-term it can vary. So -- so our sort of baseline is somewhere around 1,000

gallons per minute. We might be able to go lower than that, we might want to be able to go over that a little bit, but we're operating in that area somewhere but we need some of that flexibility in that space as we develop our operations. And this is all really about optimizing production, having some of that flexibility to optimize as we go along.

MS. LESSARD: And my last question for right now is -- don't laugh, Bob -- is what's the impact of the fish if you have to switch between these sources?

ERIK HEIM: Again, our fish people are coming on later on so you can probably interrogate them, but I'd like to repeat that we only exchange 1 percent of the water at a time, so if you suddenly increase the salinity level or decrease it on your exchange it takes quite a bit of time before you see any dramatic changes in the actual fish tanks. So this is typically something that, you know, our staff that you will be speaking to later has a lot of expertise in. So fish are not keen on a rapid change in salinity, so if we have a flow-through system and suddenly increased the salinity by 10 PPT they would not be happy. But we have this firewall because we're recycling water and adjust the -- that means we can take a few PPT difference on the water we take in

without any dramatic impact on the production because the salinity change would be more gradual and slower.

MS. LESSARD: Thank you.

MR. DUCHESNE: Mr. Pelletier.

MR. PELLETIER: Thanks. I'm following on Mr. Sanford's questions here and it relates, you know, to issues about climate change and the models and I appreciate that quite a bit of work has been done over the last-year-and-a-half and you've based that and my understanding is you've basically done a series of aquifer tests, three of them and then you did a fourth test to verify or to calibrate that and maybe not calibrate that, but.

MICHAEL MOBILE: You've described it generally, yeah.

MR. PELLETIER: And so there is quite a bit of work that has gone into that effort. But, you know, the -- and there is also testimony here about how we expect that this particular region is going to be getting a lot more precipitation, a lot more rainfall on average. That's a projection, but with climate change issues and the variability of that and the drought periods that come and go and probably an opportunity to see more of that, I wonder about how this model might reflect a three to four months

drought period such as we saw a back in '47 or something like this, would we be still seeing those same type of results?

MICHAEL MOBILE: Yeah, it's a good question and I can say that the model is a reasonable testing ground. I think Dr. Hopeck's comments were very insightful in describing the model as a good conceptual demonstration of the proposed pumping that's been part of Nordic's applications. There is always the difficulty in trying to generate a scenario or thinking about climate change -- climate change, generate a series of scenarios that sort of encompass all of the possibilities, right, it's an endeavor that you could spend years of study on. What I'll fall back on -- well, first, let me mention we did look at the general sensitivity long-term to reduce -- to reduce free charges as I mentioned before, but I think the fall back here that we all need to remind ourselves of is the water resource monitoring plan, right, that holds the -- that is the key to holding the -- holding Nordic accountable to the permit, right, so we're monitoring conditions going forwards. There are thresholds -- hydraulic thresholds that need to be maintained. If a drought does start making a major change in the system that

is unforeseen that's where the monitoring plan becomes really powerful because it will protect against the sort of unforeseen issues if there is a, you know, a rapid decline in water level that the model simply could not predict because it was, you know, not captured by data that were available. So I understand what you're saying, I think there are, you know, many scenarios that you could come up with different, you know, forms of climate change impacts that are at least within the realm of possibility. We tried to approach it in a parsimonious way, you know, a simple way of looking at the reduction in the main source of water as we represented it within the model and then of course the monitoring plan is really the -- the check.

MR. PELLETIER: And I suppose that would be the same type of response, Mr. Neilson, your work -- one of the tools you were using was, what did you call it, StreamStats. It's a USGS tool and I assume that goes back on rainfall data that goes way back of watershed flow data that goes way, way back?

THOMAS NEILSON: Yeah, so StreamStats is the -- you're correct, that is a tool we were using that's a U.S. Geological Survey tool developed to try and estimate sort of the flow characteristics of the

watershed in a given region. And there is a lot that goes into that model that they run in order to generate the statistics that we used, but rainfall and historic rainfall is one of those components. So they take into account regional rainfall and that's explicitly listed in their -- in the output from that model which we included as an appendix to the hydrogeologic report. I believe the rainfall that they estimated in the StreamStats tool is very similar to what the 86 year average rainfall -- annual rainfall is for the Belfast station, although we have seen over the past 30 years about 5 inches on average more on annual precipitation in Belfast in the past 10 years than over the 86 year record. So there is a trend currently in the data that suggests we're seeing some increased precipitation on an annual basis.

MR. PELLETIER: And finally, just operationally should you start seeing things go south here and greater water needs for longer periods of time, is this something that in terms of the operations it's -- how quickly are you able to adapt to something that say all of a sudden for whatever reason you lose access to a -- your Belfast Water District water all of a sudden for some particular

reason, is that -- can you shut off parts of your system and...

EDWARD COTTER: I think the Belfast Water District is a good example because that's the one that's most susceptible to an immediate shut-off because of the infrastructure that's out of our control. And in that case, we're using most of that, as I mentioned, for non-fishery operations, so it's no different than if another business lost water all of a sudden. In general, our procedure would be that we would reduce feeding of the fish immediately and that very quickly within a couple hours reduces our water needs considerably. The fish stop growing as much. They stop producing feces, which then -- so then you've got less to clean. You've got less food particles in the water so you've got less cleaning operations that need to be done and filtering operations, therefore you don't need to replace as much of that water. Other systems such as the bioreactors and systems we'll get into later of water treatment are not as stressed once that feeding stops and the fish process slows down. We can maintain that for weeks on a low feed, low ration situation if needed.

MR. PELLETIER: Thank you very much.

MR. DUCHESNE: I have three questions unless anybody else from the Board or staff does. Yes, Mr. Livesay.

MR. LIVESAY: Thank you. Assuming you're operating under optimal conditions and you've got the salinity that you want, what's the relationship between the amount of water used in Phase 1 versus Phase 2. In other words, I'm guessing it's not sort of a doubling when you go from Phase 1 to Phase 2 because there is some baseline water to Phase 1. What's their relationship?

EDWARD COTTER: The -- just sticking strictly to fresh water --

MR. LIVESAY: Right.

EDWARD COTTER: -- the operation would be -- it's pretty much a linear increase. We would like to -- we propose to get the limits established so that we have the flexibility to test all of the systems and be able to use maybe just groundwater for a little while until you make sure that, you know, the reactions are what we expect based on that monitoring plan. But, yes, the fresh water alone is relatively linear as we expand the facilities we get up towards the needed increases.

MR. LIVESAY: So it's basically Phase 1 is

half of the optimal amount --

EDWARD COTTER: Yup.

MR. LIVESAY: -- and Phase 2 is roughly the second?

EDWARD COTTER: Yeah. You know, the operation and the -- when we bring cohorts online at the smolt building make a bigger difference because then all of a sudden we're using the same amount of fresh water we would use in Phase 2 and there is less elsewhere, so the ratios are a little bit different, but overall, yes.

MR. LIVESAY: Yeah. So one of the -- well, can you just refresh my memory on the overlap between Phase 1 and Phase 2? And the premise for asking is I'm trying to get a handle on if we're monitoring during Phase 1 how long a monitoring run are we going to have to begin to understand sort of what Phase 2 might look like or how we faired on Phase 1, so can you refresh my memory sort of how the build-up is going to propose?

EDWARD COTTER: The schedule is a little bit variable depending on the start of construction and winter seasons and so forth, but our base model is approximately three years of construction for Phase 1. At that point, we put in our schedule that's in

our application a varied period of assessment and review which would include reviewing water monitoring before Phase 2 starts.

MR. LIVESAY: So before Phase -- you have to build Phase 2 as well, so we'll have the smolt phase done and will we have the more mature fish that are in the -- I'm assuming they're bigger tanks because they're bigger fish, but with sort of the fresh and salt water blend --

EDWARD COTTER: Mmm Hmm.

MR. LIVESAY: -- will we have a handle on the full operation of Phase 1 before we enter Phase 2?

EDWARD COTTER: Yes.

ERIK HEIM: I might add that we are surely also testing Phase 2 levels in Phase 1, so we will also work with those levels and pump those levels. It's easy for us to increase exchange and while doing such testing so that we have stress test Phase 2 levels before we start construction of Phase 2 as well.

MR. LIVESAY: Okay. That's helpful. So one of the -- I guess one of the things I've heard in at least one, two, three, maybe four people's questions is sort of the gallon per minute calculation and I

can certainly appreciate that you folks want to preserve maximum flexibility for a host of reasons, you talked about the changing salinity in the bay and you wanted to be respectful of the resource and having some flexibility with the salinity in the tanks and then -- so I -- I can certainly appreciate that and I'm hoping that you can appreciate that we're faced with and the Board is faced with sort of knowing what we're permitting. And so I guess my question is are you willing and able to provide us with some more information on the amount of water that will be used, gallons per minute, factoring in these reasonable presumptions?

EDWARD COTTER: Yeah, I think we can certainly open up those design books with you in conversations, bring in the right part of our team that has better understanding of those and set parameters to the permit that makes sense for everybody.

MS. BENSINGER: I think the Department is seeking the answer to that question today right here.

MR. LIVESAY: Well, if you have it today that would be great. I mean --

EDWARD COTTER: Yeah, well, those people are in the room but they're not on this panel right now,

so I'm not the person to tell you that answer and I don't think Erik is either.

MS. BENSINGER: But this is the panel on water usage, right?

MS. TOURANGEAU: If -- can I interject? The -- am I correct that the permit application has a number in it?

EDWARD COTTER: Yes.

ERIK HEIM: Yes, the water sources are defined and those combined are sort of the upper and the mid of what we feel comfortable with and we may be able push it down a bit.

MS. BENSINGER: And what are the numbers that the permit application uses?

EDWARD COTTER: 455 GPM groundwater, 500 GPM from the Belfast Water District and 250 GPN surface water.

MR. LIVESAY: And so my understanding is that's based on sort of the modeling that was done to reflect for the -- an upward bound that you're saying you'll operate below?

EDWARD COTTER: Yes.

MR. LIVESAY: And then there is the separate question which is how much water are you actually going to use?

EDWARD COTTER: We -- we expect to -- we've designed the system to be able to operate at full efficiency using -- using no more than those numbers. So that's -- we understood that that's the limitations of the site and we've made sure to design the facility to operate within those parameters, so that's the proposed parameters that we've put in the application.

MS. LESSARD: Now, I have a question. It's his fault.

MR. DUCHESNE: Okay. I'll go to Ms. Lessard and I have three in the queue here, Ms. Bertocci, Ms. Bensinger and --

MS. LESSARD: So if the total is the amount of those three sources, but it's not the intent of the applicant to utilize all three sources as part of that, what is the amount that or at least that was the answer I thought I got a while back was that there was a hierarchy in terms of how water would be used that if -- if the total is the combination of the three but you're not going to use all three in that capacity, what's the number that it is going to be required of in particular the groundwater in order to operate this facility?

ERIK HEIM: I think what it comes back to

again is redundancy. So, for example, if the water monitoring program were to show that, you know, a few years from now we might want to reduce to 400 gallons a minute we would have the redundancy, for example, in surface water to draw on that as an option. And that's -- to put it this way, to build a business without any redundancy is a risk, so that's why there is not exact science in saying exactly what we need because there are so many variables that could impact it, but what we can say is that the total amount listed in the application is something we're very comfortable with. We may end up going close to that, but it also may happen that we end up at 900. It's -- it's just a matter of us as a business to ensure that we have appropriate flexibility to address various scenarios in the future and that's -- otherwise, it will be a high risk for us to say, you know, we're going to do exactly this and then we have no room to maneuver if there are things that happen that, you know, would lead us to say, well, we're going to reduce our groundwater or we're going to reduce our surface water that would leave us no room to maneuver and adjust the business and that's why we're not saying it's an exact number. There are many variables in play that's what we're trying to

say. But ideally, you know, we're think we're going go be somewhat below that maximum level we listed in the application and that's what we generally think.

EDWARD COTTER: The other thing is we tend to in these discussions talk about worst case scenarios, which makes a lot of sense, but in this case we've looked at best case scenario. If our production director is able to maximize the biomass in the facility and fully utilize every part of the facility at once and is right on his game and he's done that we're going to need the full amount of water that we've requested, so we don't want to limit ourselves to less than that. In reality, there are going to be operational restrictions and limitations that are going to cause us to not always be at full output of our facility and we therefore won't need full usage of the water, but we'd hate to restrict ourselves and not allow us to operate the facilities at full capacity. Does that make sense?

MS. LESSARD: Sort of.

EDWARD COTTER: 1205. 1205, that's the number.

MS. LESSARD: No, I understand the need for redundancy. I understand the need to have flexibility in your operation. I understand that.

I'm still wrestling with the relationship between the three water sources in the -- in this facility and sort of what the impact to those three resources will be as this facility moves forward, that -- that's all I'm still wrestling with and that's probably my brain more than anything else, but I -- that's what I'm looking for here is how those -- what that relationship is and what the impact to those three resources is over time because that's what we're permitting here is the impact to all of that -- to our -- that's what -- excuse me, that's what we're being asked to permit here for all of that, so that's why I'm asking. I am trying to figure it out, that's all.

THOMAS NEILSON: The one -- the one thing that I would say to sort of help understand what the impact would be should all three of the resources be used at their full permitted capacity that -- that -- those were the conditions that we considered in the hydrogeologic investigation and that Mike considered in his modeling effort, so the model takes into account full use of that 455 gallons per minute of groundwater and the hydrogeologic investigation looks into what that surface water withdrawal would look like as well, so that -- we -- when we did the

investigation and put together the reports that ultimately underpin the permit application we assumed full utilization of all of those resources.

MS. LESSARD: Thank you.

MR. DUCHESNE: Ms. Bensinger.

MS. BENSINGER: Thank you. Some of my questions are follow-up to previous questions asked. As Ms. Lessard said, you described the system as one -- the system of fresh water use as one with redundancy built-in, but now you're also testifying that under ideal circumstances you would use -- you would use the full range of options all at once, so I'm having trouble reconciling. How do you reconcile -- reconcile saying that there is redundancy if you would be using all three at once?

EDWARD COTTER: Yeah, the -- the statement that I was trying to make was that we would not want it limit ourselves to less than this amount of water. The redundancies have to do with pulling back on operations should it be needed for a -- for a situation where our water availability is impacted. So, yes, if we're running on full capacity and we are -- every tank is at full utilization we're going to use a closer number to the 1,200 per minute of combined water. If one of those uses then goes away

we go back to the operational changes where we reduce feeding and other things to adjust the amount of water that is going to be needed. At that point, we're going to stop being full utilization. We're going to be losing revenue because the fish are not going to be growing, but it will be a situation where we will be able to manage the resources such that we do not have negative packets if that makes sense. That's where the redundancy is.

MS. BENSINGER: If a permit were to be granted and if such a permit were to limit groundwater withdrawals, for example, from the groundwater wells or to limit withdrawals from the reservoir to less than what you're requesting permission to withdraw might the proposed project actually be smaller?

EDWARD COTTER: I think that it would take some analysis to understand what the proposed numbers were and what our revised operations would look like.

ERIK HEIM: I can just add to that that the natural consequence with that will be to reassess and reconfigure for an assumption of higher salinity. In the end, the scale of the facilities has been a pre-condition for this project in terms of output and volumes and efficiency, so. But there is possibility

of reconfiguring but it's not the optimal case for production as we see it.

MS. BENSINGER: You've described cold water as a necessary -- as a necessity and one of the things that drew you to Maine, cold fresh water, I assume, as well as cold ocean water, if due to climate changes the ocean water increases significantly in temperature as we're seeing it is, would this impact your mix of fresh water to salt water and would that possibility require additional use of fresh water?

ERIK HEIM: No. We've done scenarios on the ocean temperatures and upper ranges and scenarios. In comparison, we mentioned the facility in Florida, they chill their water from significantly higher temperature levels that we are doing and that's -- there is two benefits, less infrastructure and less power cost by being in this location. So even if we saw an average increase a few degrees over time we have the cooling capacity to deal with that.

MS. BENSINGER: You say that monitoring -- the key is the monitoring plan in terms of how to deal with a potential drought scenario, but how does the proposed monitoring plan establish that this project would not have an unreasonable impact on

groundwater quality -- quantity, sorry. The Department is tasked with making a finding, the Board ultimately, with making a finding that the applicant has demonstrated that its proposed withdrawals here would not have an unreasonable impact on groundwater quantity and the Board can't just rely on a monitoring plan if you say, well, if it does have an impact then we'll do something about it. The Board has to make a positive finding in order to issue a permit that it won't based on evidence before the Board.

MICHAEL MOBILE: Understood. And, yeah, but in relaying the concept that it's only the water resource monitoring plan that that matters. The model is still a robust representation of the system that does provide useful information in terms of the available water quantity post-development. It's a model that's grounded in data. We've calibrated that model to three pumping tests worth of data, three substantial field efforts, the model shows consistency with all three of those efforts. We've independently validated it or verified the model versus another pumping test worth of data where we don't. We just allow the model to represent that pumping test that we see consistency there as well.

So the model is a very useful representation of this system that can provide looks forward, but it is still a model, right, and we -- we all have to recognize that it's a model. It has uncertainty tied to it. We can't just say the model says 455 gallons is going to work, no monitoring needed, we're good to go. The regulations don't allow that anyway, right. The monitoring plan is simply that verification, that data-based activity that occurs after the fact that puts checks on what the model is predicting because we recognize that uncertainty. So I didn't mean to -- I hope I didn't mislead you with what I said before. The monitoring plan has tremendous value here, but it's not the only piece.

MS. BENSINGER: One other question about the model. You said that data are not available to model density dependent flow here. At least that's what I thought I heard you say.

MICHAEL MOBILE: Yeah.

MS. BENSINGER: How could that data be obtained or can it be obtained?

MICHAEL MOBILE: So I've -- I've got some experience in modeling salt water intrusion. It's a pretty significant challenge because so often you think about where you're collecting monitoring data,

you're collecting it landside, right, you're drilling wells, you're collecting water quality data, so often that dataset is as we call it extremely fresh or those data are biased in one direction in terms of density. They reflect where water is fresh, but you have the inability to really -- even in very large datasets to identify where things are starting to change to not fresh, where that salt water interface is occurring. So in this particular case, we've got a lot of data on-site. We have one well that we actually have some water chemistry data that's giving us the indication what preexisting conditions are, but even with a dataset, you know, 50 times the size of this including, you know, 50 times more wells it's unlikely that we'd have a really robust dataset that would allow us to not only calibrate the models in current conditions but reliably push forward in time and make projections. And on top of that we're dealing with a fractured rock, a fractured bedrock environment that we're modeling that really complicates how salt water intrusion occurs and unconsolidated materials that front, you know, the salt water/fresh water interface can move in a relatively uniform, relatively predictable way physically. In fractured bedrock you've got, you

know, these weaknesses that occur in a, you know, in places that aren't necessarily fully predictable, so it's a very difficult thing to do and if we had done it I would -- the uncertainty would have been significant. It would have been large.

MS. BENSINGER: There has been some testimony about participating neighbors and abutting property owners. If the Board were to grant a permit, would -- and I'm not sure I understand all of the components of that participation and you said negotiations are ongoing, but if the Board were to grant permits, would Nordic -- how would Nordic react to a potential condition on such a permit that would require Nordic to replace people's private well supplies that were impacted either in quantity or quality and I'm thinking about salt water intrusion possibility.

EDWARD COTTER: That would be in line with the conditions that we've established in our monitoring plan, so we're -- we're fully on board with that.

MS. BENSINGER: And would that replacement be tying those properties into a public water supply?

EDWARD COTTER: We laid out several options. It might be simply a filtration system, it might the

replacement of a private well, it might be tying them to public water, several different options out there.

MS. BENSINGER: Okay. And then one last question. I can't remember who it was that testified that the area of recharge by precipitation is larger than the project parcel. How big is the area of recharge by precipitation?

MICHAEL MOBILE: Yeah, that's a good question and that was me. I can't give you an exact number because our model doesn't predict the exact footprint. What I can tell you is that where the hydraulic effect of the pumping is notable extends, again, beyond the western limit of the Little River, so the section of Little River connecting the two reservoirs and in a north/south direction because there is actually a characteristic within the bedrock formation that we've understood from the testing that there is sort of this preferential what's called anisotropy evident in the hydraulic nature of the bedrock that extends more east/west, preferentially east/west to north/south, so that -- that recharge area tends to extend a little bit farther west than the -- the Little River that I just referenced, but I can't -- I can't give you an exact dimension because the model doesn't give that exact output.

MS. BENSINGER: Thank you.

MICHAEL MOBILE: You're welcome.

MR. DUCHESNE: Ms. Bertocci.

MS. BERTOCCI: Thank you. This is a question for Dr. Mobile and it relates to your scenarios in the drawdown and how that relates to your water resource monitoring plan. On Page 3 of your pre-filed direct testimony you state that the results of your drawdown rates and the simulations are spatially variable and stabilization will require a significant period of time and that stabilization times are estimated to be many years to more than a decade for all locations under all simulated scenarios. So my -- to me, that sounds like it's going to be a long period of time before we know exactly what's happening to the ground water in this area. Is that a correct understanding and, if so, how are you considering that in the design of your water monitoring plan?

MICHAEL MOBILE: Yes, that's a very intuitive question. The -- it's a very insightful question. The -- the distinction to be made though, so stabilization and occurrence are distinctly different, right. What the model does is we run what's called a steady state scenario that actually

takes the model out to the full degree of change. It has no real time component to it. You add something in and it simulates to the end of where things fully stabilize. Then we run what's called a transient scenario that actually has a time component to it so we can understand that rate of change. So an idea as we simulate the change from the pre-development non-pumping condition to plugging in the pumping and simulating forward, you know, how changes occur and the timing associated with those. So what we see when we do that is if we move off-site, particularly in the areas of where the private supply wells reside, that -- that drawdown condition, the water level change does begin to occur within, you know, a relatively short amount of time, but the curve that develops in terms of that drawdown building takes many years to really reach the stabilization period where it hits that ultimate stabilized level that's predicted by the steady state simulation. Is that too technically detailed for you?

MS. BERTOCCI: No, I think I followed you.

MICHAEL MOBILE: Okay.

MS. BERTOCCI: And so what does that mean for the length of your monitoring program in the various wells and off-site wells and residential

wells? How are you factoring that in?

MICHAEL MOBILE: Well, one perspective on that is that the amount of change will take, you know, we've got multiple years of construction to consider. We've got a phased construction approach that will be occurring in a permitting condition, so there is ample time to kind of collect data to assess that trajectory of change if we are seeing it and see how well it's matching up with the model predictions, so that's -- that's one perspective on it. Tom, I don't know if you have...

THOMAS NEILSON: Yeah, so in practice kind of how the length of the monitoring plan will be determined is it depends in some sense on what we see, so the other monitoring plan similar to this that I'm familiar with, for example, there is a plan laid out similar to what we've provided that has all of the monitoring points and it has certain performance thresholds that need to be met and there is in that permit or the monitoring plan a review time that is some number of years typically down the road. Once that period of time elapses then the -- any changes to the permit would require DEP review, so DEP would look over all of the data that have been collected and DEP would be continually looking at the

data as it was collected and if any changes were proposed to the monitoring plan it would have to be approved by the DEP. So in the context of the question you're asking, I think the length of time that the monitoring plan would be in place for depends on how clearly we're able to determine trends in the groundwater data and how closely those match the modeling.

EDWARD COTTER: And at no time or under no situation have we proposed to terminate the monitoring plan prior to full build-out and utilization of the water, so I think that the way I -- I take this not having the background that Mr. Neilson does is at the end of construction when we're hopefully using full capacity that we've requested we would look at the trends and see if it's stabilized before anything would change.

MR. DUCHESNE: Great. Thank you. I have about three questions. The first question, I guess, for Mr. Neilson and this question really relates to something we'll tackle later on, but this was in your testimony and I've got you here now, but I just need to check my math. You're the first person, I think, who has indicated how much water on an annual basis is coming out of the Little River Stream and I think

your testimony was 7 billion gallons a year, 7 to 8 billion gallons a year?

THOMAS NEILSON: Yeah, I actually have -- so the mean annual discharge based on the StreamStats estimate is 8.2 billion gallons per year would be discharged from the Little River.

MR. DUCHESNE: And the reason I ask is because we'll talk later on about how much discharge is going to come out of wastewater treatment and how does that compare because I never grasp what these numbers really mean in terms of what's already being discharged by natural means versus what will be coming out of the plan, so I thank you for that.

The next question is to Mr. Mobile. In Paragraph 14 of your testimony you indicated that you did see some impacts to private wells located westerly of the proposed facility. A little more recently you suggested that some of the recharge for the aquifer comes from the west. Can you describe what you saw?

MICHAEL MOBILE: Sure. So those two things sort of align in terms of my interpretation of the results. So what we do see is that that steady state result, sort of this stabilize drawdown effect, we see elongated drawdown, not significant drawdown but

elongated drawdown to the west of the Little River, again, where it connects the two reservoirs. So you can see where in that pumping condition the static level -- the difference between the static level and the drawdown level is measurable in that area. It's a model prediction. It's not an absolute prediction for any given well, but that gives an indication that that is an area that is contributing recharge to the simulated well system.

MR. DUCHESNE: And what did you see for impacts to wells? Did you test those private wells or -- after monitoring?

MICHAEL MOBILE: Okay. So -- right.

MR. DUCHESNE: What did you see for effects?

MICHAEL MOBILE: Well, right. So during the hydraulic investigation many of those private wells were outfitted with transducers, so we're recording data as that's occurred. What we saw in general is that there was no real notable, and, Tom, correct me if I'm wrong here, but no notable change during the pumping tests with one exception and that was when we did add two wells on the northern portion of the property and in that case we did see a measurable amount of drawdown in at least one well to the west of the river.

THOMAS NEILSON: Yeah, what we found with regard to drawdown that was measured during tests that were done on the site, when we pumped the three wells that are in the proposed configuration for this 455 gallons per minute proposed withdrawal, we did not see measurable drawdown in private water supply wells and we had wells south of the site, west of the site and north of the site. All of the -- I think we had all of the closest wells plus more wells going further afield. So the three wells that we're proposing as production wells did not produce a measurable effect during our tests. If we included two additional wells that were located on the northern portion of the site, we did very quickly produce a measurable effect in private wells to the west of the site. And we intentionally -- the fourth test that we ran we intentionally went through a staged aquifer test where we turned pumps on during different points of the test so that we could explicitly isolate which wells were causing that effect so that we could exclude them from the production well proposal. With regard to the drawdown predicted by the model there is some estimate of drawdowns predicted by the model.

MICHAEL MOBILE: Yes. So right. So

long-term what the model does predict is that as the aquifer kind of stabilizes to provide -- rebalance the sources of groundwater and sinks to groundwater, we do see some predicted drawdown in areas west of the Little River. In general, in that area it's a maximum of a 10 foot change, I believe, overall, but what we understand about private wells in the area is that in general the average well is about 150 feet deep below ground surface. The depth of water ranges from I think about 10 feet to 25 feet or so, so we're talking about more than 100 feet of standing water column to begin with and what we understand about the pump settings in most cases is that that sort of change is pretty unlikely to, you know, result in any sort of significant impact to operations. But, again, we need to understand more about, you know, the wells overall, their pump settings, et cetera, to really evaluate that position.

THOMAS NEILSON: Yeah, we did -- when available through people's private records we looked at what the depths of their private wells were that we were monitoring. I think 150 feet is on the shallow end for most of the wells there and pump settings typically fall towards the bottom of that depth. As part of the water resources monitoring

plan, we have proposed for all of the private wells that would be in that monitoring program we would actually go out and verify the depth of the well and the depth of the pump so that we could have a well specific understanding of what an adverse effect would be to that well as opposed to a generic adverse effect.

MR. DUCHESNE: Great. I think the point I'm going to clumsily drive at is that we have several principals about groundwater in the state and Ms. Daniels, I think, referred to that in her questioning earlier and I think Ms. Bensinger did too. The first principle is the one that I think was characterized to be antiquated before and that we'll be happy to principally call it absolute dominion, that is whoever sits on top of the water owns the water, but we have a whole another set of principles above that that's built into just about all of our laws, the Natural Resources Protection Act, how we administer Clean Water Act, low flow -- low flow stream rules were mentioned earlier and that principle is, yes, you can draw out the water, but you can't impact adjacent users and to the extent that adjacent users are impacted that may require us to take a second look at how this is going to avoid

affecting neighbors and abutters. I suspect what we'll hear in testimony tonight from the public and from other members of the community that it's all well and good to connect them up to public water or fix their wells, but that may not satisfy the bedrock principle of we are not affecting adjacent users when you're drawing down a whole lot of water from one area. So that's the principle I'm trying to get to and if you can just characterize that from your own point of view that will be helpful.

EDWARD COTTER: I think to -- to reiterate a little bit of what was just said the difference comes to whether or not a drawdown is considered an impact. So because we see situations where we have over 100 feet of standing water, if a 10 foot drawdown is experienced that does not necessarily mean it impacts the use of that well and that is the -- that is the criteria that we are looking at is that we propose is that no adverse impact means that the end user of that well will not see any changes in quality or quantity and that's what we've assessed and that's the proposal that's in front of you.

DR. HOPECK: If I could just clarify further.

MR. DUCHESNE: Great. Dr. Hopeck. Nice and

loud.

DR. HOPECK: All right. If I could take the Board's attention to Figure 14 in the original report and that, I believe, shows us the steady state simulation.

MS. BENSINGER: You mean Nordic's pre-filed testimony?

DR. HOPECK: In the application -- in the original application.

MS. BENSINGER: Okay. I'm not sure that we have that -- oh, yes.

THOMAS NEILSON: Dr. Hopeck, is that in the technical memorandum --

DR. HOPECK: Yes.

THOMAS NEILSON: -- that Mike prepared?

DR. HOPECK: Yes.

THOMAS NEILSON: I have a copy here if anyone on the Board would like to see it.

DR. HOPECK: And I believe that's the steady state simulation.

MICHAEL MOBILE: I'll wait for Tom to get to this in front of me. I selectively printed only the text.

DR. HOPECK: That's Appendix 15-A, Exhibit 15 of the Site of Location Application. What that

figure shows --

MS. BENSINGER: Okay. It is -- it is in the materials that were provided to the Board? Mr. Pelletier is showing it to me right now. Appendix 15-A?

MICHAEL MOBILE: It's Figure 14-A from Appendix F to the hydrogeologic investigation.

MS. BENSINGER: Maybe we don't have it right in front of us. Can you characterize it for us, please?

DR. HOPECK: Yeah, if I'm characterizing this correctly this is the steady state output.

MICHAEL MOBILE: That's correct for the 455 gallon per minute scenario.

DR. HOPECK: Yup. What -- what this is showing is the decline -- the anticipated model decline in groundwater elevation based on pumping continuously at that 455 gallons per minute for an indefinite period. Basically for long enough for the aquifer to stabilize itself and to sort of come back to some ideas we were getting at before that you still have the same amount of precipitation falling on the site you probably have an increased amount of leakage in from the seaward side to compensate for some of that, you have an increased amount of leakage

downward into the aquifer from the shallow -- excuse me, down to the bedrock aquifer from the shallow sections of the site or from the surface water so that you now are balanced again in a situation where 455 gallons permitted is leaving the site as fish and wastewater basically, is that essentially correct?

MICHAEL MOBILE: Yeah, it's consumptive use that's in the simulations.

DR. HOPECK: So in this situation what we are looking at is where existing wells are with regard to this predicted drawdown in a particular -- where predicted drawdown in the area of where the Little River is the concern from our standpoint is looking at changes in groundwater elevation on the order of 100 feet or so in the area of the bedrock section of the Little River and also, although I'm kind of gathering that they have some -- there is some more tolerance for salinity, but also looking in the intertidal zone looking at significant long-term drawdowns in there and potential lack effects for salt water intrusion. So where we are looking to get with the monitoring plan is to look at this, the pre-development usage and range of changes in water level in people's wells within this area, what the well construction is, what its depth is to the extent

we can find out where the pump intake setting is and say, okay, how does all this play together? Does this suggest that pre-development range of water levels in this well and the elevation for the pump intake would leave this person with their existing level of usage or potentially impaired level of usage and at what point does that kick in? And that comes back to sort of the question we circled around is what is the water usage at this site?

MS. BENSINGER: And I just wanted to make sure that all of your questions for the applicant were asked on this because this is the last opportunity you'll have to question on water usage and once the record is closed then the record is closed, so if you have other questions of the applicant now is the time.

DR. HOPECK: Well, I mean, I -- I was bringing this up to clarify for the Board what -- what we were looking at and that we still have, as we've talked about before, quite a ways to go on what the monitoring plan looks like and what level of information is needed for it and I guess just to -- to go back to the applicant I think that the level of uncertainty we have particularly about how we start implementing things like are we at steady state,

are -- you know, where are we in terms of the frequency of required monitoring. The extent to which actual water usage is uncertain and granting that we understand that you need flexibility, the extent to which that's not known is problematic from our standpoint as to saying, well, this looks like it has achieved steady state now if you -- if you still have 25 percent or so slack that's built into the system. And it's not insurmountable, I just want to -- from our standpoint that's a logic problem for us, so on one hand we considered, you know, sometimes we're sort of hearing that you're looking at the Belfast Water District source as basically drinking water and sanitary water and the rest of it is slack, but on the other hand you might be using it sometimes. So for -- for us to understand what the water usage is and to look at this figure in terms of setting a performance standard for how things are going with you operationally that would -- that would create some uncertainty if we get to that stage.

EDWARD COTTER: I think if it -- hopefully if this is answering one of the concerns. We did mention that the well water is a -- is a prime source for us that we would like to be able to utilize and if it were to make sense we could put in conditions

such that we would, as Mr. Heim mentioned before, provide stress testing during early construction phases so that we would utilize that close to the 455 that we proposed and to the point where we could validate assumptions or understand if there were changes that needed to be made.

DR. HOPECK: And certainly that's helpful, but as Dr. Mobile has pointed out and certainly, you know, given the size of this system it can take a very long time for this to stabilize in this new configuration.

EDWARD COTTER: Right.

DR. HOPECK: It's certainly useful information to do that early in the operation as you're ramping up in particular so -- and, again, in particular if we can see that there is anything -- if there is anything very different --

EDWARD COTTER: Yup.

DR. HOPECK: -- from what's in the model, but we still -- we still have some uncertainty as to what happens when we get out to full production, which is --

EDWARD COTTER: Understood.

DR. HOPECK: -- which is inevitable and you understand that.

MR. DUCHESNE: Ms. Lessard.

MS. LESSARD: Thank you. You talked about -- why would you end the monitoring program?

THOMAS NEILSON: It's -- the monitoring program would never end outright. The -- what is typical and what Dr. Hopeck was alluding to is after a certain period of time of consistent usage of groundwater you can sometimes achieve stabilization, which means essentially you've reached the new normal for that aquifer. And if it's -- if the data collected is sufficient to show that the new normal has been reached sometimes it's appropriate to reduce what is being monitored or the frequency of the monitoring, but it would -- you would never get rid of the monitoring program entirely. My -- my purpose in bringing up, you know, changes to the monitoring plan over time is more to get to the fact that the monitoring program has to by nature be somewhat flexible and that tends to be more towards the conservative side of things, but it -- there is no situation where we would end the -- recommend ending the monitoring plan. There are scenarios where we might recommend or we might suggest reducing the frequency of monitoring or some other parameter of the monitoring plan, but that would only be after a

substantial amount of data has been collected and there is a scientific backing for why that is justifiable and then that would go to the Department for their final decision. So I -- I don't know if that answers your question entirely.

MS. LESSARD: Well, the way this works, I believe, is that you have a couple years of construction and you have Phase 1, which has a certain usage that will be required and it takes, I think, about two years to grow a fish, give or take, and you're going to have Phase 2, which adds more, so we're already in the five, six, seven year range out before you are utilizing or likely to be utilizing the maximum amount of water that's been predicated in this, so -- so that you can't get to steady state if you haven't gotten to your maximum usage and stayed there for a period of time in order for it to be evaluated. I am not a hydrogeologist and I'm --

THOMAS NEILSON: That's generally correct.

MS. LESSARD: I am trying to figure out where the -- that's why I said, you know, we talked about changing, I would think that the monitoring were this permit issued would be critical because you're not going to get to where you're going to be looking at establishing a steady state for many

years.

THOMAS NEILSON: That's correct, yes. There would be no -- no reason whatsoever to suggest a change -- a reduction in anything in the monitoring plan until at least several years had passed of full production capacity, so that would be the seven years plus multiple years on top of that before that would even become a possibility. And there is some language in the water resources monitoring plan that indicates after full build-out several years would pass before any -- there would be any thought of reducing the monitoring, but that's not a -- reducing monitoring is not a key component to any of this. If increased monitoring is warranted for a long period of time that is something that we will continue for a long period of time.

MS. LESSARD: Thank you.

MR. DUCHESNE: Great. Seeing and wanting no more questions, we are under a certain amount of constraint on how long this process can go because of the public process tonight with the public needs to change the room over somewhere around 4:30 to 5, so whatever we accomplish this afternoon has to happen before then. I'd like to see if we can power through recross and -- redirect and recross expeditiously.

MS. TOURANGEAU: I'm waiving.
MR. DUCHESNE: You're waiving. We're done.
MS. RACINE: Just one.
MS. DUCHESNE: Yes, please.
MS. BENSINGER: No.
MS. RACINE: Oh, okay.
MR. DUCHESNE: Right.
MS. RACINE: Thank you.
MR. DUCHESNE: Thank you. We will take a five minute break and then Upstream is going to up with their witness.

(Break.)

MR. DUCHESNE: Thank you. Our mistake. We said that the audience could submit questions and, yes, you can. We didn't tell you how or when to do it. When I -- when the audience wants to ask questions of the panel, I need to receive those questions while the panel is up here to address and I would ask you to at any time you want to submit questions through Ruth Ann, yeah, through Ruth Ann and we'll make her famous right over here. So you may forward a question to her at any time, she will forward it to me and I will do my best to see if further questions can be asked. I was submitted after the fact about seven questions, all of them

good, two of them pertinent to other matters and discussion. Two of them I think we really didn't touch on very much that might be useful, so I'd like to just take a moment before we start with our next panel to put Mr. Cotter on the spot.

MR. DUCHESNE: Somebody asked a question that none of us did. What happens if new water users move to the area, what if current water users increase their use, does Nordic have any limits or are all of the limits now on other potential users, that is if you take all of the resources remaining available does that prohibit any other business or development from taking place?

EDWARD COTTER: I think the pertinent issue there is that the current area is residential -- mostly residential with some industrial sites. The proposed site is one of the last industrial sites in the area that's currently unused with one other. But the other pertinent thing is that there is Belfast Water District runs right by there on Route 1 and new users within I think the number is 300 feet of Route 1 and the existing water district infrastructure are required by city ordinance to use Belfast Water District. The District would rather have new users on their system rather than groundwater wells, so

there is very limited opportunity for a significant ground water user to move into that area. If a development with 10, 15 homes were put into that area, I think that the impacts -- the water use for those homes would be on a smaller magnitude that would not make a significant impact on the watershed.

MR. DUCHESNE: Thank you. I had to chuckle a little bit because the potential for new users to move in to take a lot of groundwater is right here. That's just irony. Water use models are created using the applicant's data not independently derived to confirm data regarding water and availability and effects of Nordic's use. What confidence can the public and DEP have in model accuracy when essentially it was your people who did it?

EDWARD COTTER: That's something I think we're going to come into several times through testimony. As is standard -- as is standard, the weight is put on the applicant to prove that the application meets the guidelines and we have no other way of doing that rather than hiring professionals from the area that are well qualified and that have licenses to perform the work that they're doing. In some cases, I think staff has looked at the model,

they've validated assumptions, they've provided their opinions to the Board, but the applicant of a project doesn't really have an opportunity other than to hire a consultant. What we can do is ensure that our consultants are highly qualified professionals with licensure, which is, you know, put in front of you to show that they are qualified for this task.

MR. DUCHESNE: Great. And one last question that just came in, we understand that the current agreement with the Belfast Water District is over after six years, what happens then?

EDWARD COTTER: Well, I think in six years we're going to have a lot of information about our water usage. We expect that we will likely -- we will always be a customer of the Belfast Water District in whatever form they're in and we will use that amount to that ability to use that water as much as we can. We don't have to -- under the current use we will be paying for 500 gallons per minute whether or not we use that amount. That's the criteria of the basis of that agreement. In seven years, if we're using 350 gallons a minute, we'll be paying for 350 gallons a minute instead of 500. That would be advantageous to us, but it doesn't mean that we lose the ability to get that water.

MR. DUCHESNE: Great. Well, thank you very much and thank you for your flexibility.

EDWARD COTTER: Sure.

MR. DUCHESNE: And now we can go to the Upstream presentation and their star witness.

FREDERICK JOHNSON: That's a lot of pressure.

MR. DUCHESNE: Yeah. Jump right in.

FREDERICK JOHNSON: Okay. Thank you, Mr. Hearing Officer, Board, Mr. Commissioner. My name is Frederick Johnson. I'm here on behalf of Upstream Watch. First, I'm going to tell you a little bit about myself before I get into the testimony. I've been hired by Upstream Watch to review the water supply issues as they relate to the proposed water use. My background is that I have a degree in geology and hydrogeology and a Master's degree in Environmental Engineering from Rensselaer Polytechnic Institute. I've been doing this work for almost 45 years now and in various capacities, consulting. Primarily, I spent 12 years as Director of Environmental Affairs for a Fortune 200 corporation and understand the whole permitting and development aspect of major projects.

I was first hired -- I want to just rewind

little bit and just say that my first involvement with this was long before Nordic or before Nordic was even involved. I was brought to Belfast to take a look at the efficacy of the Little River watershed and over the potential for the local land trust to take ownership of some -- of the property, specifically the Upper Reservoir and a fair amount of property around it, but along with that became the ownership of a dam. And I'm going to be talking about those dams and how they relate to the water supply and the potential water supply that's proposed by Nordic. So in doing that, I just want to emphasize that my testimony here today began long before Nordic was involved and then eventually Nordic became involved, but the original discussions had to do with what to do with that dam and dams along the Little River watershed, how to restore that watershed perhaps and various options. So a little bit of context there.

My -- I am going to testify on two major issues here that I looked at or I found. And the first is on the extraction of groundwater from the site, the 455 gallons of proposed groundwater extraction from the site. And we've heard testimony before there was a lot of work done relative to the

efficacy of getting that 455 gallons, the quantity of water, a fair amount of testing done and I don't have any issue with that per se. But one of the things that came up in those tests was we heard in previous testimony that there is salt water intrusion identified already and the tests show that under stress conditions of that aquifer it's likely that more salt water intrusion will occur.

Clearly in Chapter 375, no adverse environmental effect, salt water is specifically mentioned or salt water intrusion is mentioned as an adverse environmental effect and the -- Nordic's application acknowledges that and they -- they talk about the salt water intrusion. They address it with a monitoring plan or a proposed monitoring plan and in my opinion and I think what we just heard in previous testimony is that monitoring plan is still a work in progress. It's also looking in the rear view mirror to a certain extent in that it's going to tell you after a problem has already occurred.

I heard from the groundwater modeler and I do -- I do agree with him after dealing with groundwater models most of my life being the user of said models. I am not the modeling guy, I will say that, but they are predictive and tough to predict,

but the modeling done was predominantly for quantity and not quality. And the quantity -- the quality issue relative to salt water intrusion, yes, it's difficult, but it's not impossible. I've dealt with soluble transport models in various capacities and it can be done. In addition, there is other things other than modeling that could be looked at to help understand or be more predictive to the impact of salt water intrusion to this project.

I think simply saying that we're going to monitor and we'll figure it out after we see if there is salt there I would suggest to you that it is not effective enough or not a basis for which to issue a permit until we have a better understanding of that prediction. So more prediction, more specifics, and contingencies for said monitoring -- or intrusion. It may occur and, if so, what. Who is it going to impact? What is the potential zones of impact? And what are you going to do about it? And I think that needs to be more defined. I would suggest to you that that is a condition for the permitting.

From there, I'd like to move on to another issue that hasn't been discussed in, you know, what do dams have to do with potential water supply? Well, the Nordic application here is withdrawing

water in two locations, one from surface water as we've heard before 250 gallons per minute from the Little River from the Lower Reservoir, and 455 gallons per minute from groundwater. The Little River watershed will be occupied in a huge way by the proposed Nordic facility and it will be using its resources. The Little River watershed and -- and all of the modeling and the predictions that we've heard from Nordic's application is predicated on the existence of that watershed as it exists today. And the essence of my testimony is that the watershed as it exists today is highly dependent upon two very aging and poorly maintained dams. Those dams define the watershed, but that won't occur into the future unless somebody does something about those dams. And through this whole process I mentioned my previous engagement relative to the land trust, there was an interest by the land trust in restoring one of the river --

MS. TOURANGEAU: Objection. This goes beyond the scope of the written testimony. I'm sorry, I think my mic was off. I am objecting in that there was no discussion of the prior engagements by the coastal -- the land trust in any of the pre-filed written testimony.

MR. DUCHESNE: Yeah, that's a legitimate objection. I would sustain. And it's just a matter of focusing, I think, a little bit more on --

FREDERICK JOHNSON: Okay. Thank you. We'll just get back to the issues with the dams. The dams are in poor condition, specifically the Upper Dam. I brought here today a picture of that dam that was taken back in December of 2017 and in looking at the quality of the dams we did some background research into existing files and so forth. And one of the conditions of the Upper Dam in particular was as a result of a 2015 inspection by the Maine Emergency Management Agency had a requirement of maintenance on that dam that that dam be kept at a water level below at least 6 feet below the top of the dam. It's questionable whether that was the top of the dam or a particular pipe, but the point being is that dam must be maintained below the top of the dam because it is considered to be unsafe. You will see in a 2017 photograph that that dam is flowing full over the top and water is coming over that top and water -- if you saw that close up you would see water coming right through the dam through cracks. I stopped by there this morning, the same condition exists, so clearly that dam is not being maintained as it was specified

in the 2015 inspection report.

The point there is that it appears that these dams if they did not exist would change the baseline for the predictive modeling that's been done by Nordic. The reservoirs may not exist. If the reservoirs did not exist then that really messes up the basis for surface water withdrawal. The surface water withdrawal is based upon a certain surface area of reservoir. If there is no reservoir what happens to the permit for withdrawal of surface water? These dams will define whether those reservoirs can exist into the future and it seems like they've been sort of collateral orphans through this process that at one point they were owned by the Belfast Water District, but who is going to take care of them? And it appears that Nordic is highly dependent upon the existence and integrity of those dams into the future, but we haven't heard a lot about what will happen to those dams and who will maintain them. And if that does not occur, I think some of the assumptions that you've heard earlier today will be changed significantly as a result. You know, so the two things that will occur and the groundwater model could change, but more importantly the surface water model will change. There will be no reservoir there

after those dams will no longer exist. So they are in disrepair. They are in neglect. I just showed one quick example here of the water falling over the dam when it's not supposed to. If you were to go by there during low flow conditions you would see that that dam has water seeping through cracks, freezing and thawing. It's only a matter of time until that goes. That's the Upper Dam, but if the Upper Dam goes it will certainly impact the Lower Dam and could cause the Lower Dam to fail.

We heard earlier that the Lower Dam was assessed or it was felt that it can maintain its integrity to support the Nordic operations. Our work did not show any sort of structural analysis of those dams going back to 1979 through reports. There is no structural evaluation of those dams that seems to be available, so I question has a structural evaluation of that Lower Dam been done if it is integral to the Nordic operation and then from there what is the maintenance required to that dam and who will do that maintenance. I suggest that that should be a condition of any approval.

With that, I'll finish my formal testimony and open it to questions, I guess.

MR. DUCHESNE: Thank you. And I guess we go

to cross by Ms. Tourangeau.

MS. TOURANGEAU: Good afternoon.

FREDERICK JOHNSON: Good afternoon.

MS. TOURANGEAU: Who owns the dams?

FREDERICK JOHNSON: It's my understanding it's the Belfast Water District.

MS. TOURANGEAU: Did they know that you were assessing the dams?

FREDERICK JOHNSON: We inquired with them when we were getting baseline information.

MS. TOURANGEAU: When was that?

FREDERICK JOHNSON: That was in 2018.

MS. TOURANGEAU: When did you do your assessment?

FREDERICK JOHNSON: I first visited the dam informally in December of 2017.

MS. TOURANGEAU: When was this assessment done?

FREDERICK JOHNSON: This assessment was done through 2018.

MS. TOURANGEAU: What was the date of the site visit?

FREDERICK JOHNSON: I'll have to look at my -- it was done by engineers out of our Portland office. I believe --

MS. TOURANGEAU: Does February 4, 2019 sound correct?

FREDERICK JOHNSON: I remember it was February. It was last year.

MS. TOURANGEAU: Yes.

FREDERICK JOHNSON: Yes. Okay. Thank you.

MS. TOURANGEAU: Does that sound right?

FREDERICK JOHNSON: Yes.

MS. TOURANGEAU: And it was Ms. Jillian Williams?

FREDERICK JOHNSON: Jillian Williams, yes.

MS. TOURANGEAU: Did she have permission from the Belfast Water District to assess the dams?

FREDERICK JOHNSON: I'm not sure if they contacted them prior or not.

MS. TOURANGEAU: Did she talk to them?

FREDERICK JOHNSON: I believe she did, yes.

MS. TOURANGEAU: So that's not documented in the report?

FREDERICK JOHNSON: She talked to various people when she was here. I know she did an inquiry of available records.

MS. TOURANGEAU: Yup.

FREDERICK JOHNSON: Yes.

MS. TOURANGEAU: Did she talk to the

individual at MEMA that had assessed the dams previously or did she just do a records search there as well?

FREDERICK JOHNSON: I know she did the records search. The -- and it was two people referenced, a Mr. Fletcher and a Mr. Ciomei.

MS. TOURANGEAU: Mmm Hmm. And those are just from the records, she didn't have a conversation with Mr. Fletcher?

FREDERICK JOHNSON: I am not certain if she had actual conversations with them.

MS. TOURANGEAU: Okay. So the report claims -- your testimony claims at Page 4 and 5 that the dams have fallen into disrepair and the continued neglect will lead to further deterioration and eventual failure to the dams. And you conclude that clearly the dam was and is not being maintained to mitigate the risk; is that correct?

FREDERICK JOHNSON: That's correct.

MS. TOURANGEAU: Were there any conversations with the Belfast Water District about these conclusions and what maintenance they are doing?

FREDERICK JOHNSON: Not to my knowledge.

MS. TOURANGEAU: Thank you. Is the Belfast

Water District aware that -- of your report at all? Have they seen it or had any opportunity to comment on it?

FREDERICK JOHNSON: I don't know the answer to that.

MS. TOURANGEAU: Do they know that you're here today testifying about the condition of the dams that they own?

FREDERICK JOHNSON: I do not know that. I know that the report was put into the public record.

MS. TOURANGEAU: Are you aware that Nordic has an option to acquire the Lower Dam from the Belfast Water District?

FREDERICK JOHNSON: That's my understanding.

MS. TOURANGEAU: You also -- your testimony concludes that the aquifer testing demonstrates that the pumping of wells will cause salt water intrusion from Belfast Bay and that the demonstrated and eventual salt water intrusion from on-site pumping of groundwater is an adverse effect under Maine law at Pages 5 and 6, does that sound right?

FREDERICK JOHNSON: Yes, it does.

MS. TOURANGEAU: Are you aware that the data collected at the site during drilling and aquifer test indicates that salt water intrusion is already

present?

FREDERICK JOHNSON: Yes, there was some degree, but the testing also showed that it increased with time with pumping.

MS. TOURANGEAU: That pumping?

FREDERICK JOHNSON: Would -- would increase the level of salt water intrusion or water conductivity as it was used as a surrogate for the test.

MS. TOURANGEAU: Is that -- are you aware that there is a water resource monitoring plan that's been put in place or that is proposed to be put in place?

FREDERICK JOHNSON: Yes, I am aware and I heard testimony earlier today about that.

MS. TOURANGEAU: Have you reviewed that plan?

FREDERICK JOHNSON: I have not seen it.

MS. TOURANGEAU: So you are not aware of any measures that are put in that plan to monitor and assess salt water intrusion?

FREDERICK JOHNSON: I am aware of what it intends to do and that it will monitor and assess and I think that's a good thing.

MS. TOURANGEAU: Mmm Hmm.

FREDERICK JOHNSON: My testimony was that was not enough.

MS. TOURANGEAU: Are you specifically aware of what the requirements are or would be under the resource monitoring plan for salt water intrusion?

FREDERICK JOHNSON: The specific requirements?

MS. TOURANGEAU: Yes.

FREDERICK JOHNSON: No.

MS. TOURANGEAU: Okay. So you don't know whether that plan would or would not determine whether there is salt water intrusion that is caused by the pumping or not?

FREDERICK JOHNSON: Presumably it would because it would measure it in real time.

MS. TOURANGEAU: Thank you.

MR. DUCHESNE: I believe at this point we will go to Board and staff questions. Questions from the Board? Questions from the staff? Yes, Mr. Martin.

MR. MARTIN: I'll have a similar line of questioning as I did to Nordic. You're making -- raising issues regarding both on reasonable adverse effect on quantity and water quality. At least I guess the statements that I heard is that you

would call it adverse --

FREDERICK JOHNSON: Specifically to quality, yes.

MR. MARTIN: Specific to quality. Do you have anything more to share in terms of what leads you to believe that this adverse effect would be unreasonable?

FREDERICK JOHNSON: I don't know because I'm not sure if it's really been assessed to the level that would determine its reasonableness. You know, it says it will happen and it will be monitored, but what is -- what do the data say or the facts say about its potential impact, its predictive impact and whether that is reasonable or not.

MR. MARTIN: Thank you.

MR. DUCHESNE: Other questions from the Board? I just, real quickly, I suppose Belfast Water District stands to potentially gain a new client and to make some money. Could they not redirect some money they make towards dam repairs?

FREDERICK JOHNSON: They could. That's their business, I suppose.

MR. DUCHESNE: Okay. Thank you. Seeing no further questions, we do appreciate it.

FREDERICK JOHNSON: Okay. You're welcome.

MR. DUCHESNE: Why don't we go to redirect. I'm sorry -- oh, there is?

MS. RACINE: Yes, just a couple.

MR. DUCHESNE: Yes.

MS. RACINE: Mr. Johnson, in your opinion, did you need to speak to somebody at the Belfast Water District or anybody at GEI to make your assessment about the dams?

FREDERICK JOHNSON: No, we were using available information that was already in the record.

MS. RACINE: And back to Chapter 375, if you know, in terms of what's required for the application in terms of adverse effect, what's your understanding about assessing that in advance of a permit being issued?

FREDERICK JOHNSON: My understanding is to understand what the adverse effect might be and whether it would be adverse. Mr. Martin's question, I think, was a good one and that is, you know, what is the potential, you know, it's kind of answering the so what. If we have salt water intrusion, so what will it do, will it harm anybody or potentially harm anybody and I'm not seeing that.

MS. RACINE: So it's your understanding that

that would -- is it your understanding that that would be done in advance, not necessarily in a monitoring plan?

FREDERICK JOHNSON: Correct. A monitoring plan is after the fact that it would be done up front.

MS. RACINE: Thank you.

MR. DUCHESNE: Thank you. Ms. Daniels, I would ask if you have one question perhaps to ask. And I may -- preferably I would like to be able to ask questions before we get to redirect and recross just so that people are able to follow-up on your questions if needed, but I can make an exception in this case because you're an intervenor and you get to do that.

MS. DANIELS: Thank you. Mr. Johnson, I was wondering if you had an industry and you required fresh water whether you think it would be preferable to have to pay for your water or to get your water for free?

FREDERICK JOHNSON: Water is never free. Our business is predominantly water resources and states like the State of California and water always comes at a cost.

MS. DANIELS: Yes. Yes. But in this case,

Nordic is in a position with what they learned from their assessments of fresh water availability where they're going to pay $750,000 a year or thereabouts for water from the Belfast Water District as opposed to getting that water from wells off of their own land because those wells don't have the capacity, is that your understanding as well?

FREDERICK JOHNSON: It's my understanding that they're using a mix of water to augment because getting it all from Belfast would be both expensive and tax the existing system.

MS. DANIELS: Yes. Yes. And --

MR. DUCHESNE: I do need to keep this relatively brief because of the schedule we're on.

MS. DANIELS: Thank you. My final question is when using the groundwater such as the water found in the Lower Reservoir that water has a certain degree of turbidity to it, would that be a correct statement?

FREDERICK JOHNSON: Well, the Lower Reservoir is not groundwater, it's surface water.

MS. DANIELS: Surface water. I'm sorry, I had that wrong.

FREDERICK JOHNSON: It would -- any surface water has a certain level of turbidity. I'm not

familiar with the specifics of the Lower Reservoir turbidity.

MS. DANIELS: My neighbors on the Perkins Road wouldn't do laundry when they were on that reservoir because it stained it.

MR. DUCHESNE: Okay. We have now strayed off the testimony a little bit, but that's well-intended anyway. Thank you very much.

MS. DANIELS: Thank you.

MR. DUCHESNE: Great. We can --

LAWRENCE REICHARD: Excuse me, may I ask a question?

MR. DUCHESNE: No, I'm afraid not.

LAWRENCE REICHARD: Okay.

MR. DUCHESNE: I'm sorry.

LAWRENCE REICHARD: All right.

MR. DUCHESNE: Inappropriate time.

LAWRENCE REICHARD: Okay.

MR. DUCHESNE: I believe we are done with this --

MS. BENSINGER: Recross.

MR. DUCHESNE: Oh, recross.

MR. PARKER: Bob.

MR. DUCHESNE: Oh, and Mr. Parker has a question, I beg your pardon.

MS. TOURANGEAU: Oh, do you want to go first?

MR. PARKER: I don't have a lot.

MR. DUCHESNE: I think he should.

MR. PARKER: Something I find interesting in your presentation, you said that somebody, I guess, with engineering credentials reviewed the dams from a structural point of view?

FREDERICK JOHNSON: In a very preliminary way, yes, sir.

MR. PARKER: Okay. I'm a retired engineer.

FREDERICK JOHNSON: Mmm Hmm.

MR. PARKER: Any time I find something is potentially damaging or have a chance of failure I'm obligated to notify the owner. Did they ever notify the water district that they have an eminent problem facing them that could collapse and cause calamity to Route 1 and in effect down below?

FREDERICK JOHNSON: Well, that information was in inspection reports that were in -- done by MEMA as recently as 2015 where the information about the integrity of the dams or lack thereof, particularly that Upper Dam, was -- was noted. And there was maintenance requirements placed on the dam by MEMA to the water company and that Upper Dam was

in pretty poor condition, so they have that information. It's in their files.

MR. PARKER: Well, I still am concerned that they may -- don't even know they have it because if it's been a public report that's filed, they're the owner, they may have a liability hanging over them they don't know about.

MR. DUCHESNE: Great. Thank you. And recross? Any other questions in the meantime? Seeing none, thank you.

MS. TOURANGEAU: To Board Member Parker's point, you said that your report was just on the papers.

FREDERICK JOHNSON: I'm sorry.

MS. TOURANGEAU: Is it your testimony your evaluation of the dam was just by someone going out and looking at it and reviewing reports that were in the files at MEMA?

FREDERICK JOHNSON: Existing information that was available in the public record, yes, MEMA and --

MS. TOURANGEAU: So you did not have conversations with MEMA or with the Belfast Water District about work that might have been done or work that might not have been done? There was no

conversation whatsoever?

FREDERICK JOHNSON: I -- I can't testify to that. I'd have to talk to Miss Williams and find out who -- what exactly she did and who she talked to during her inspection for her visit and, you know, she did a lot of research into the files and who she talked to.

MS. TOURANGEAU: Is it your practice to make assessments like this based only on historic documentation?

FREDERICK JOHNSON: Oftentimes, we do in -- for environmental and other reasons look at existing information just to get an idea of what current conditions may be.

MS. TOURANGEAU: So you wouldn't normally have interviews like in a Phase 1 ESA under the ASTM, you wouldn't consider conversations with folks --

MS. RACINE: Objection.

MS. TOURANGEAU: -- as a normal part of your process?

MR. DUCHESNE: May I hear the objection, please?

MS. RACINE: Objection. This may be going a bit far a field with redirect.

MR. DUCHESNE: Yup, I would agree.

MS. TOURANGEAU: One more question then. You testified on recross -- redirect, sorry, that the WRMP, the water resource monitoring plan, was only after the fact, but the last kind of back and forth that we had was that that is something that's happening in real time, which is your understanding given that you haven't reviewed the WRMP.

FREDERICK JOHNSON: When I said it's after the fact, if it's strictly a monitoring plan it will tell you when you have a problem after you've have the problem. My testimony was more, I think, that more could be done to be predictive of what the potential impact may be. I think it gets to Mr. Martin's questions earlier today, you know, what are the adverse effects. I have not seen a compilation of what those adverse effects could be and what the, you know, potential risk could be if there were salt water intrusion.

MS. TOURANGEAU: So you haven't reviewed the WRMP so you don't know whether --

FREDERICK JOHNSON: Right.

MS. TOURANGEAU: -- it has...

FREDERICK JOHNSON: My understanding is it's still a work in progress and it's still being flushed out with various details.

MS. TOURANGEAU: No, it's in the administrative record.

MR. DUCHESNE: Great. Thank you very much. We're scheduled for a 10 minute break. We seem to be more or less on schedule, so I would like to congratulate everybody in the room today for keeping things on pace, so you're doing well. Do we need 10 minutes? We can take 5. And Mr. Reichard is up next.

(Break.)

MR. DUCHESNE: I have been asked by the court stenographer -- court stenographer, DEP stenographer. I am getting ahead of myself. Although, you know, I think I'd make a good judge.

(Laughter.)

MR. DUCHESNE: -- that when there are multiple conversations going at once it's difficult for her to transcribe everything and to catch up, so I am going to ask for should there be any interchanges to try to keep them somewhat under control and I will constantly look over at Robin to make sure she is up to speed and getting it all down because this does go into the official record. So with that in mind, we look forward to the remarks of Mr. Reichard.

LAWRENCE REICHARD: Okay. Thank you. Before I start, I would like to perhaps clarify what I think was -- something that was said earlier to the effect that revenue from Nordic Aquafarms would provide revenue for the water district to do maintenance and make repairs. I would like to point out that Nordic Aquafarms will also enormously tax that system that -- and thus it will increase the necessity for repairs and maintenance thus greatly if not entirely offsetting whatever benefit there might be from the revenue produced by Nordic Aquafarms.

In my written testimony submitted to this body there was text from an email sent to me by Dr. Mark Gold, Associate Vice Chancellor for Environment and Sustainability at the University of California at Los Angeles. In that email, Dr. Gold wrote in regard to climate change; if your area becomes more susceptible to drought then the inputs to your aquifer and watershed will reduce and the proposed groundwater pumping could lead to overdraft of the aquifer or even subsidence of the properties above the aquifer. In the long-run, aquifer capacity could be severely reduced. We've seen this all over the world. Most notably in California in our San Jaoquin Valley. The other area where climate comes in is for

agriculture and urban water supplies. If surface water supplies get reduced due to climate change, drought or increased demands then that could lead to greater reliance on groundwater, which then leads to overdraft subsidence, et cetera.

In his email, Dr. Gold asked, what is the overall volume of the aquifer and do you know if it has been overdrafted in the 50 -- the last 50 years? Well, we do know the answer to that question. As reported in the Bangor Daily News and Republican Journal there was once a severe shortage in the Town of Northport adjacent to Belfast and abutter to the 56 acres that Nordic Aquafarms wishes to destroy. In its desperation to remedy this problem the Northport selectmen went to its larger neighbor of Belfast asked -- for asking to tie into its water system, but unfortunately they were turned away. Why were they turned away? It was not because of callous indifference. It was because of a well-founded concern that the aquifer and watershed that supplied Belfast had limits to its capacity to produce. It was not inexhaustible. That was true then and that is true today, only more so. In spades. On steroids. For that was before the climate crisis came screaming down upon us and indeed upon the

entire world. That was before out of control wild fires killed an estimated 1 billion animals in Australia. That was before those same wild fires sent plumes of smoke miles into the air that stretched 5,000 miles across the Pacific and over to Eastern South America and were visible from satellites. Before all of that.

In his email, Dr. Gold also wrote, quote, if surface water supplies get reduced due to climate change, drought or increased demands then that can lead to greater reliance on groundwater, which leads to overdraft. Excuse me, I may have said that earlier. While hereto we know that never mind California, right here in Maine we have had drought over the course of recent years.

We also know that despite Nordic's initial glib, ignorant and uninformed assurances that our aquifer and watershed could handle the company's enormous water needs, Nordic's test wells not only prove that untrue, they drew as has been stated here today salt water intrusion. The death knell of not only individual wells but very possibly entire aquifers. Just ask Miami. But that hasn't stopped Nordic from continuing to issue glib assurances. That hasn't stopped Nordic from putting lipstick on

that pig. Clearly, it would be sheer foley to allow an entity to suck 630 million gallons of fresh water from our aquifer and watershed. Just ask Northport.

As members of this body know, I ask that the competence and truthfulness of Nordic Aquafarms be approved as topics for this proceeding and that request was denied. As one who has lived in mid-coast Maine for more than 35 years and as one who for more than five years has lived by the bay into which Nordic wishes to spew 7.7 million gallons of industrial fish feces per day, I am disappointed that this Board will not entertain those issues. I call these issues basic and fundamental because in its deliberations this body is relying heavily on information and data supplied by the applicant. And if Nordic Aquafarms is providing to this body false information then this body's deliberations and thus its eventual decision will be fatally flawed and a gross disservice to the good people of Belfast, Waldo County and indeed the entire State of Maine.

That brings us to the other basic fundamental issue and that is competency. If the applicant is incapable fulfilling the highly questionable and demonstrably false promises it makes to this body here today, then, again, this body's

deliberations and its eventual decision will be fatally flawed and history will record this proceeding as a farce and a sham. And there is ample concern for both issues, the truthfulness and the competence of Nordic Aquafarms.

From its first public information meeting in February 2018, Nordic Aquafarms has justified its proposal by saying that industrial factory farmed salmon is the most efficient means of protein production. That is a lie. To produce industrial factory farmed salmon corporations like Nordic Aquafarms must feed the salmon fish feed from the day they are hatched until the day they are rounded up and slaughtered. The composition of that fish meal is changing and evolving at a relatively rapid pace thus Nordic's legitimate inability to tell any of the concerned citizens of Belfast exactly what kind of fish feces it wants to spew into our beautiful bay. But the current industry standard is 70 -- approximately 70 percent soy. Much of the rest is composed of foraged fish. The small fish --

MS. TOURANGEAU: Objection. I've let this go on, but we are far, far outside both the water use scope of the hearing topic and the scope of Mr. Reichard's pre-filed testimony.

MR. DUCHESNE: It is sustained. And I've been letting it go for a while as well to see if we could drift back to water usage, so I would like to confine ourselves to that. I believe when we get to waste discharge and other factors there will be more than ample opportunity to dive deeply into those subjects, but if we focus on wastewater usage right now that would be helpful to the Board.

LAWRENCE REICHARD: If we're going to dive deeply into those issues why were they denied when I requested that they be topics?

MR. DUCHESNE: I would recommend that you continue on with your remarks on water usage. Thank you.

LAWRENCE REICHARD: Nordic Aquafarms has never built nor operated a project this big. In fact, not even one-fifth of the size of this. And we simply don't know how much water Nordic's operation could end up using. None of Nordic's other facilities as stated is more than one-fifth the size of what they propose to build here. When Nordic Aquafarms publicly announced this project and for months thereafter Belfast was repeatedly assured that its aquifer and watershed could easily handle the load that Nordic proposed, but that has been proven

untrue by Nordic's own test wells.

In September 2018, I interviewed Professor Are Nyland in his office at the University of Bergen in Norway. Professor Nyland is an aquaculture expert and has been teaching at the University of Bergen for more than 30 years. In my interview with him Professor Nyland expressed considerable skepticism about the figures provided by aquaculture companies. Professor Nyland said a good rule of thumb is to take any figure given by an aquaculture company such as water use and add 50 percent. Nordic's water use figures are based on a highly questionable assumption expressed here today by Nordic CEO Erik Heim that everything will go as planned. This is simply unrealistic. No project this size ever goes as planned.

In the previously cited March 5, 2019, salmonbusiness.com article XL Caitlin insurance executive Geir Myre is quoted as saying in regard to land-based aquacultures there are many small things that can go wrong. In the same article, Mr. Myre went on to say, we, that is to say XL Caitlin, are not 100 percent negative on land-based aquaculture. This is not reassuring. When things go wrong Nordic Aquafarms will have to use considerable quantities of

money to clean up the mess.

Our environment is changing fast. The climate crisis is bearing down upon us at an alarming rate and with the climate crisis we simply don't know how our aquifers and watersheds will perform in the future. Scientists can make models and projections, but ultimately we don't know how the climate crisis will play out. Ultimately, the only predictable thing about the climate crisis is its unpredictability.

In recent years, Maine has experienced drought. Fortunately, this drought has not been severe, but that may change and we would be reckless to gamble with our water supply. The climate crisis is descending on us with frightening speed. I urge you to help provide the foresight and leadership that is so urgently and desperately needed by Maine, the United States and indeed the entire world. I urge you to fulfill the duty and responsibility bestowed upon you to protect Maine's precious and vital resources. At some point and at some place, human beings must start to take the climate crisis seriously. I urge you to make that time now and make that place here. Thank you.

MR. DUCHESNE: Thank you. If you would

stay, please --

LAWRENCE REICHARD: Yes.

MR. DUCHESNE: -- for cross-examination from Nordic.

LAWRENCE REICHARD: Certainly. With pleasure.

MS. TOURANGEAU: Good evening, Mr. Reichard. Just a couple questions.

LAWRENCE REICHARD: Sure.

MS. TOURANGEAU: Are you aware that any approval issued by the Board and the Department for surface or significant groundwater wells will have limits that are based upon protecting our resources?

LAWRENCE REICHARD: I do not place much faith in such limits when a $500 million corporation is at play. I believe the historical record will back that quite solidly having been raised by historians.

MS. TOURANGEAU: Are you aware that there are no private wells in that area along Route 1 where there is existing salt water intrusion?

LAWRENCE REICHARD: I believe that this -- that this enormous project which uses vast amounts of water will have an effect on wells far beyond the scope of what you're talking about.

MS. TOURANGEAU: You mentioned some correspondence with a Professor Nyland, was he commenting on Nordic's project and application in Belfast?

LAWRENCE REICHARD: He was commenting on it, as I -- as I said, on the aquaculture industry in general, which he has been studying for 30 years.

MS. TOURANGEAU: Thank you.

LAWRENCE REICHARD: You're welcome.

MR. DUCHESNE: Are there questions from the Board or staff? Seeing none. Is there any redirect? I guess not. And so there can be no recross. So we are concluded on that subject. And we may be complete for this session. We adjourn until 6 o'clock.

MS. BENSINGER: But Ms. Bertocci has a few logistical...

MR. DUCHESNE: Housekeeping matters.

MS. BERTOCCI: The parties are asked to take their papers with them because those tables are going to have to be moved so that we can bring in additional chairs for the public. We've asked the parties to have a representative here this evening. Each of the parties should have at least one representative here this evening since you do have

the option of cross-examining a member of the public should they, you know, should you feel the need especially if they have anything particularly technical that they're wanting to present to the Board.

MS. BENSINGER: As we indicated in our pre-hearing conference just before we started the hearing there will be chairs on both sides -- a limited number of chairs on both sides facing inward and those are for the representatives of the parties. Thank you.

MR. DUCHESNE: I think everyone caught the message, you should take your stuff with you because we have to reconfigure the room.

MS. BENSINGER: And if you could take your tag with you too that would be -- your placards.

MR. DUCHESNE: And if you're not satisfied with your name, take somebody else's.

(Laughter.)

(Hearing continued at 4:19 p.m.)

C E R T I F I C A T E

I, Robin J. Dostie, a Court Reporter and Notary Public within and for the State of Maine, do hereby certify that the foregoing is a true and accurate transcript of the proceedings as taken by me by means of stenograph,

and I have signed:

_____

Court Reporter/Notary Public

My Commission Expires: February 6, 2026

DATED: March 8, 2020

< Dates >
February 11, 2020 1:25
FEBRUARY 11, 2020 1:16
February 2018 283:7
February 4, 2019 264:1
February 6, 2026 290:15
January 10, 2020 48:25
January 14 143:16
January 15, 2019 100:11
January 2, 2019 40:20
January 27 143:16, 144:4
July 12, 2019 18:15
March 2019 34:10
March 5, 2019 101:22, 285:17
March 8, 2020 290:17
November 1 37:13
September 2018 135:5, 285:2
#1 4:35
#406 4:26
$1 20:14
$1. 203:7
$188 70:19
$2 168:1
$200 44:5
$270 69:18
$35 60:12
$4 66:10
$400 34:18, 83:17
$45 60:12
$50 44:17, 82:19
$500 35:24, 100:1, 287:15
$63 51:4, 99:25
$63,600,000 82:4
$63.4 43:17
$63.6 50:24, 51:13
$64 38:20
$750,000 167:25, 272:3
$8 38:16
'47 211:1
(202)841-5439 4:11

< 0 >
04005 5:10
04101 3:31, 3:47
04101-2480 3:10, 3:19
04849 4:10
04915 3:38, 4:27, 4:36, 4:43
04973 4:18

< 1 >
1,000 208:25
1,200 61:6, 224:24
1. 20:21, 35:1, 193:22, 215:10, 216:25
10 21:15, 22:1, 22:18, 23:24, 25:18, 29:24, 44:14, 63:2, 81:13, 81:15, 94:22, 95:11, 152:19, 198:14, 209:22, 213:14, 239:6, 239:10, 241:15, 253:3, 278:4, 278:7
10,000 63:22, 63:24
100 22:17, 71:18, 167:19, 239:11, 241:14, 244:15, 285:23
1000 3:30
103 7:7, 191:13
105 7:8
107,122 7:11
109 7:12
11 5:9
114 7:13
115 23:9, 33:3
12 21:21, 136:10, 136:19, 193:12, 255:21
12. 136:18
12.7 43:10, 82:6
1205 222:21
1205. 222:21
124 7:15
12:30 123:10
13 80:17, 99:25, 118:8
134 7:16
14 21:6, 236:15, 242:3
14-A 243:6
15 72:20, 138:16, 159:19, 242:25, 253:3
15,500 117:21
15-A 242:24, 243:5
150 239:8, 239:22
159 7:17
169 7:18
170 7:19
175 197:15

181,242 7:20
197 7:21
1970s 162:15
1979 262:15
1990. 110:16

< 2 >
2 21:18, 36:1, 44:9, 44:19, 44:20, 44:22, 44:23, 60:22, 61:9, 69:16, 72:25, 73:3, 73:18, 82:20, 87:23, 90:11, 147:10, 215:9, 216:3, 216:9, 216:14, 216:17, 217:3, 217:5, 217:13, 217:16, 217:19, 217:20, 249:11
2,000 63:8
2,500 26:4, 60:18, 117:23
2. 62:13, 73:22, 215:8
2.4(C 69:4
2.B(4 93:20
2.C(2 86:12, 94:5
20 6:5, 20:10, 42:16, 42:25, 71:1, 76:2, 82:2, 106:5, 110:6, 159:19, 159:21, 187:17
200 22:17, 69:17, 255:22
2011 34:17
2013 25:22
2014 34:17, 43:18
2014. 25:22
2015 260:12, 261:1, 274:21
2017 260:8, 260:19
2017. 263:16
2018 96:1, 127:22, 128:5
2018. 263:12, 263:20
2019 23:6, 37:19
2020/2021. 45:15
203,220 7:22
2030 26:17
205,220 7:23
207 3:11, 3:20, 3:39, 3:48, 4:19, 4:28, 4:37, 4:44, 5:11
21 70:18
210 7:24
215 7:25
22 21:21, 70:18
220,000 63:20
224 7:26
230 36:1
232 7:27
232,252 7:28
24 6:6, 21:21
25 239:10, 246:8
25,000 26:4
250 21:13, 117:16, 148:15, 148:19, 149:2, 149:6, 149:11, 149:17, 149:25, 150:22, 151:2, 152:6, 198:15, 219:16, 259:2
253-0567 3:11, 3:20
255 8:5
263 167:7
269 8:8, 8:9
27 118:9
270 8:10, 35:25, 70:12
270,000 69:17
271 8:11
274 8:12
275 8:7
279 8:14
287 8:16

< 3 >
3 12:22, 13:5, 21:23, 22:25, 232:7
3,000 60:18, 96:15
3,700 118:8
3-A 42:22, 81:25
3-B 82:15
3-C 40:19, 83:1
3.0 36:9
30 6:8, 106:5, 110:15, 168:14, 213:12, 285:6, 288:7
300 252:21
322-0651 4:44
322-1043 4:28
322-6464 4:19
323-4850 3:39
33,000 9:19, 26:19, 32:9, 60:25
33A 3:37
34 6:9, 6:10
35 75:19, 76:2, 95:24, 98:21, 140:12, 142:5, 187:20, 282:8
350 3:46, 254:22, 254:23
373 72:24, 86:1, 86:7,

93:18
375 154:14, 257:9, 270:12
39 6:12
3:47 17:2

< 4 >
4 4:42, 22:3, 167:18, 265:13
40 44:4, 44:12, 168:15
400 221:3
401 23:25
45 123:5, 123:10, 255:20
45,000 76:7, 77:2, 98:13
455 112:9, 118:18, 137:16, 148:5, 148:11, 148:13, 152:5, 171:18, 173:3, 173:19, 188:3, 189:13, 198:16, 219:15, 223:22, 228:5, 238:5, 243:13, 243:18, 244:5, 247:3, 256:23, 257:1, 259:3
48 4:9
4:02 18:10
4:19 289:21
4:30 250:22

< 5 >
5 12:21, 22:5, 117:15, 138:16, 143:12, 144:3, 213:12, 250:22, 265:13, 266:21
5,000 281:5
5-A 143:19, 144:4
5. 278:8
50 17:4, 26:19, 27:13, 76:2, 120:12, 229:13, 229:14, 280:8, 285:11
500 43:7, 43:11, 60:15, 119:6, 148:5, 167:18, 188:3, 189:14, 194:15, 194:17, 198:18, 200:12, 219:15, 254:19
500. 254:23
51 6:13
54-acres 9:15
56 98:8, 280:13
587 117:3, 117:8, 148:23
59,64 6:14
5C 17:9

< 6 >
6 4:26, 22:8, 260:15, 266:21, 288:14
60 25:23, 190:25
600 3:9, 3:18
600,000 26:17
602-2422 5:11
61 6:15
62 6:16
63.6 43:2, 43:10, 43:13
630 282:2
65 6:17
67 6:18
69 6:19
6:00 15:5

< 7 >
7 22:12, 236:1
7.7 9:25, 77:5, 282:10
70 117:6, 117:14, 149:1, 149:14, 189:15, 283:19, 283:20
72 6:20
74,93 6:22
750,000 168:15
772-2321 3:48

< 8 >
8 22:13, 236:1
8.2 236:5
80 1:26, 6:23
84 3:8, 3:17
84,93 6:25
86 213:10, 213:14
87 6:26, 100:3

< 9 >
9 22:16
900. 221:13
9051-9064 12:22
930-5979 4:37
95 4:17
96,100 7:3
99 107:16
9:00 1:27

< A >

a.m. 1:27
abandon 84:4
ability 42:15, 43:25, 54:11, 59:14, 82:12, 100:3, 119:5, 122:18, 149:24, 151:12, 157:16, 189:5, 254:17, 254:25
abomination 105:2
above 102:11, 182:15, 240:18, 279:21
absolute 237:6, 240:15
Absolutely 105:20, 192:5
abutter 19:2, 280:12
abutters 241:1
abutting 230:7
AC 33:8
academic 27:17
acceptance 83:5
accepted 136:2
Access 21:3, 123:15, 213:24
accident 133:19
acclimate 202:17
accompanies 111:19
accompany 115:17
accomplish 15:2, 76:8, 94:23, 250:23
accomplishments 29:4
according 94:24, 141:15
accordingly 125:10
account 125:21, 125:23, 148:23, 189:21, 213:5, 223:22
accountable 211:21
accountant 80:15, 89:23
accounting 189:22
accuracy 253:15
accurate 135:22, 136:5, 136:8, 137:23, 138:4, 138:11, 139:22, 141:22, 141:24, 142:3, 145:14, 146:8, 162:5, 172:9, 173:25, 175:2, 179:17, 180:4, 181:22, 182:13, 290:5
achieve 157:22, 248:8
achieved 246:7
achieves 121:24
acknowledge 120:6, 155:17
acknowledges 257:13
acquire 266:12
acquisition 34:12, 69:22
acre 76:3
acres 21:7, 75:19, 98:8, 102:22, 140:12, 142:5, 280:13
acronym 109:16
across 25:10, 25:23, 29:18, 85:12, 118:21, 145:19, 162:1, 181:23, 182:11, 183:16, 281:5
Act 9:11, 10:7, 10:8, 12:21, 23:8, 23:9, 23:25, 32:20, 32:23, 105:6, 105:7, 119:4, 154:16, 154:21, 240:19, 240:20
action 16:6, 121:6, 172:4
actions 138:2, 158:5
active 91:10
actively 192:16
activity 176:23, 228:9
actual 46:13, 51:9, 59:6, 165:13, 173:4, 209:17, 246:3, 265:11
adapt 213:22
adaptability 113:23
add 53:23, 71:17, 137:21, 142:6, 150:5, 175:19, 217:15, 225:20, 233:2, 237:22, 285:11
add-ins 192:19
Added 61:7, 76:8, 173:7, 193:2, 200:4
adding 70:22,

166:14
addition 9:20, 17:16, 37:23, 38:15, 40:12, 40:13, 66:12, 108:7, 115:5, 201:8, 258:6
additional 26:23, 38:3, 38:22, 40:12, 61:7, 66:8, 66:9, 70:1, 83:11, 113:6, 145:15, 146:7, 151:13, 151:14, 170:2, 192:24, 195:2, 196:12, 226:10, 238:13, 288:22
Additionally 39:4, 65:10, 108:21
address 16:25, 42:10, 76:22, 112:6, 113:8, 113:18, 114:6, 138:18, 139:1, 143:23, 154:8, 155:10, 156:4, 158:6, 163:3, 164:4, 164:6, 167:2, 221:16, 251:18, 257:14
addressed 11:5, 112:6, 113:12, 125:6, 137:23, 156:6
addressing 155:7
adds 249:11
adequate 93:2
adequately 130:10
adhere 16:11
adherence 77:6
adheres 107:9
adhering 106:20
adieu 123:23
adjacent 182:10, 240:23, 240:24, 241:6, 280:12
adjourn 288:14
adjust 119:25, 121:7, 151:4, 151:5, 151:17, 190:1, 209:24, 221:23, 225:2
adjusted 108:23
adjustment 182:7
adjustments 151:21, 152:2, 208:23
administer 240:20
Administration 22:12, 85:6
Administrative 2:17, 11:17, 12:21, 16:20, 278:2
admission 99:24
adult 21:20
adults 187:21
advance 13:18, 73:13, 73:14, 73:24, 77:10, 86:18, 270:15, 271:2
advantage 166:12
advantageous 254:24
adverse 120:11, 121:5, 121:12, 122:15, 155:2, 158:4, 174:17, 198:8, 240:5, 240:6, 241:19, 257:9, 257:12, 266:20, 268:23, 269:1, 269:6, 270:14, 270:18, 270:19, 277:15, 277:16
advised 17:7, 71:15, 94:17, 99:9
advising 80:24
Affairs 255:22
affect 129:14, 177:25, 178:3
affected 74:21
affecting 163:5, 241:1, 241:6
affiliated 12:4, 80:17
affirm 15:19
affirm. 15:22
affirmatively 155:1
afield 238:10
afraid 273:13
afternoon 17:2, 17:24, 18:11, 123:4, 250:23, 263:2, 263:3
afternoons 33:7
agencies 81:21
Agency 98:24, 110:12, 260:13
aggregate 50:2
aging 259:13
ago 25:18
agree 50:14,

58:1, 126:13, 192:3, 257:22, 276:25
Agreed 55:21
agreeing 18:25
agreement 119:4, 119:10, 200:12, 201:12, 201:13, 201:15, 201:19, 201:20, 201:24, 202:3, 254:10, 254:21
agreements 42:9, 65:3, 90:6, 90:12, 168:9
Agriculture 23:21, 26:13, 280:1
ahead 49:20, 56:13, 106:24, 123:24, 129:1, 163:25, 278:13
Air 9:12, 10:16, 33:4, 33:13, 281:4
airfreighted 20:24
Alabama 134:23
alarming 286:3
align 172:19, 236:22
allegiance 98:22
allotted 16:11
allow 14:6, 18:17, 18:18, 19:7, 19:8, 32:12, 78:6, 108:9, 117:10, 121:11, 128:24, 141:10, 222:18, 227:24, 228:7, 229:16, 282:1
allowable 117:7
allowed 48:19, 59:1, 124:20
allows 107:22, 108:8, 182:1
alluded 158:1
alluding 142:12, 145:3, 248:6
almost 22:17, 77:1, 141:13, 255:20
alone 99:6, 215:22
altered 17:11
Although 14:9, 70:16, 203:11, 213:11, 244:16, 278:14
amazing 31:24, 32:1, 32:7
amazingly 172:24
America 25:10, 281:6
American 24:19
among 75:17, 81:24
amounts 98:5, 98:7, 99:8, 151:13, 199:8, 287:23
ample 234:7, 283:3, 284:6
analysis 82:22, 117:4, 118:18, 170:18, 171:3, 193:7, 225:18, 262:14
Analyst 2:16, 11:16
analytical 110:4
and/or 13:4, 161:25
Angeles 279:16
animals 281:2
anisotropy 231:19
Ann 2:17, 11:16, 251:20
Anne 4:41
announce 28:25
announced 24:25, 284:22
annual 117:20, 213:11, 213:13, 213:17, 235:24, 236:4
answered 57:5, 104:13, 125:19, 132:13, 170:7
answering 24:3, 192:13, 246:22, 270:21
answers 249:5
anti-aquaculture 75:2
anti-business 75:2
anticipate 191:6
anticipated 156:4, 243:16
anticipates 40:14
anticipating 37:6
anticipation 70:24
antiquated 163:18, 240:14
anxious 51:11
anybody 22:19,

73:16, 123:16, 215:2, 270:7, 270:23, 270:24
anyway 180:19, 228:7, 273:8
apologize 114:12, 138:13, 184:18
apparent 103:5, 145:2
appear 17:15, 203:14
appears 123:3, 261:2, 261:16
Appendix 40:19, 42:22, 111:20, 213:7, 242:24, 243:5, 243:7
appetite 46:14
applicable 18:6, 66:19, 78:1
APPLICATIONS 1:12, 9:4, 9:8, 10:2, 15:7, 20:6, 23:7, 23:12, 23:19, 77:24, 108:16, 110:3, 110:22, 115:23, 154:24, 211:9
applied 10:5, 83:22, 112:1
apply 32:15
applying 112:7, 179:5
appreciate 92:1, 106:22, 210:8, 218:1, 218:6, 218:7, 269:24
appreciated 33:25, 145:11
approach 35:3, 36:18, 46:7, 46:21, 71:6, 153:6, 157:24, 206:6, 212:11, 234:5
approaching 63:9, 71:9, 110:6
appropriate 16:6, 18:9, 19:3, 19:4, 83:2, 86:21, 112:2, 121:21, 145:22, 158:2, 158:3, 208:10, 221:15, 248:12
appropriately 112:5
approval 70:8, 119:9, 154:24, 168:7, 262:22, 287:11
approvals 45:23, 86:1, 86:16
approved 55:4, 97:10, 131:25, 235:3, 282:6
Approving 165:9, 165:11
approximate 14:14
approximately 9:15, 9:19, 9:25, 17:4, 21:6, 21:20, 44:5, 44:17, 69:17, 82:19, 107:16, 117:21, 216:24, 283:20
Aps 40:24, 41:3
aquacultures 100:9, 285:20
aquifers 281:23, 286:5
arctic 33:8
areas 99:15, 110:2, 110:7, 155:3, 178:23, 186:5, 187:2, 233:12, 239:4
arise 167:6
Army 23:24
arose 124:4
around 25:19, 40:25, 71:12, 74:11, 115:15, 122:23, 140:3, 151:2, 180:21, 199:3, 203:1, 208:25, 245:8, 250:22, 256:8
arrangement 15:13, 36:15
arrived 118:17
article 100:12, 100:14, 101:4, 101:22, 102:3, 285:18, 285:21
articles 68:17, 103:20, 115:6
arts 109:18
aspect 101:11, 177:16, 255:24
aspects 60:7, 111:22
assembled 99:17
assess 81:17, 82:18, 110:9, 115:11, 121:1, 135:15,

146:11, 147:19, 204:8, 234:7, 264:13, 267:21, 267:23
assessed 147:8, 241:21, 262:12, 265:1, 269:9
assesses 37:14
assessing 111:6, 157:25, 263:8, 270:15
assessment 63:17, 81:4, 112:19, 117:5, 135:6, 154:15, 171:13, 172:6, 179:7, 196:3, 217:1, 263:14, 263:17, 263:19, 270:8
assessments 272:2, 276:9
asset 27:18
Assistant 2:17, 11:15, 11:17, 34:11, 34:16
Associate 279:14
associated 62:24, 109:11, 155:18, 233:10
Associates 109:16
association 173:23
assume 58:6, 136:6, 203:10, 207:22, 212:19, 226:6
assumed 136:7, 224:2
Assuming 206:1, 215:4, 217:7
assumption 150:3, 184:6, 225:22, 285:12
assumptions 91:20, 202:6, 247:5, 254:1, 261:21
assurance 86:17
assurances 77:14, 77:15, 281:17, 281:24
assure 99:6
assured 284:23
ASTM 276:16
Atlantic 1:12, 9:5, 9:19, 26:7
attached 86:5
attack 104:7
attendance 11:13
attention 107:1, 109:12, 158:24, 242:3
Attorney 2:10, 3:6, 11:15, 18:11
attractive 173:8
attributed 112:13, 138:7, 138:22, 139:3
auction 203:3
audience 107:1, 251:14, 251:16
audio 12:6, 94:20
augment 18:8, 272:9
August 33:6
Augusta 15:14, 97:7
Australia 281:3
authored 17:18, 115:5, 143:15
authorization 36:16
availability 172:6, 224:21, 253:13, 272:2
Avenue 1:26
avenues 175:17, 175:18, 176:6
average 112:14, 204:4, 210:21, 213:10, 213:13, 226:19, 239:8
avoid 173:9, 173:12, 198:7, 198:8, 240:25
award 96:4
away 56:18, 57:9, 58:12, 59:2, 89:10, 96:15, 116:19, 119:15, 130:21, 131:22, 133:23, 152:1, 197:21, 224:25, 280:17, 280:18
awesome 29:21

< B >
B-1 81:19
B. 3:6
Bachelor 20:9, 109:21, 114:20
back-up 23:13, 116:16, 190:6, 202:11
background 80:24,

120:21, 196:15, 235:13, 255:16, 260:9
backing 249:2
backyard 28:2
bacteria 52:19, 55:17, 125:5, 125:15, 126:5, 127:3, 130:4
bag 103:2
baiting 32:4
balance 170:4, 175:16, 176:9, 183:22, 199:21
balanced 244:4
ballpark 188:22
bang 39:23
Bangor 12:25, 80:16, 280:10
Bank 34:17, 36:25, 37:13, 85:5
bankers 46:11, 71:9
Banks 73:7, 100:8, 100:12, 100:14, 103:9
bar 33:14, 33:17, 33:21, 75:9, 77:23
base 30:24, 36:23, 37:2, 38:18, 216:23
Based 14:15, 16:20, 16:21, 30:24, 45:8, 108:2, 117:2, 117:5, 122:22, 144:24, 145:18, 148:24, 149:5, 150:2, 150:3, 156:22, 192:7, 199:11, 199:20, 204:1, 210:9, 215:21, 219:19, 227:10, 236:4, 243:17, 261:8, 276:9, 285:12, 287:13
baseline 113:6, 117:6, 120:19, 193:8, 208:10, 208:25, 215:10, 261:4, 263:10
basic 282:13, 282:21
Basically 26:10, 35:1, 35:6, 36:25, 37:6, 37:7, 48:8, 51:6, 60:19, 61:4, 61:25, 63:12, 64:21, 68:15, 69:3, 70:22, 73:9, 111:9, 170:24, 185:6, 188:19, 199:19, 201:23, 203:24, 210:10, 215:25, 243:19, 244:6, 246:13
basing 57:2
basins 140:9
basis 57:2, 90:25, 128:6, 164:23, 188:19, 200:3, 213:17, 235:24, 254:21, 258:13, 261:7
bathroom 94:24
Bay 9:16, 10:1, 10:21, 10:23, 33:3, 76:11, 77:4, 85:13, 85:18, 98:7, 102:19, 108:11, 133:8, 156:17, 205:24, 207:19, 207:24, 208:19, 218:3, 266:18, 282:9, 283:18
Beach 5:9
Bear 98:22, 128:12
bearing 286:3
beautiful 98:8, 283:18
became 34:13, 256:8, 256:15
become 68:18, 166:13, 250:8
becomes 73:19, 183:10, 203:25, 212:2, 279:17
bedroom 155:20
beefing 167:24
beg 95:13, 273:25
began 256:13
Begging 132:18
begin 13:24, 39:18, 45:2, 45:4, 46:6, 69:7, 91:19, 95:3, 106:25, 134:18, 194:11, 216:17, 233:14, 239:12

beginning 19:10, 28:7, 38:24, 43:6, 52:11, 79:14
begs 145:12
behalf 18:11, 40:2, 77:8, 104:9, 115:21, 155:13, 255:11
behave 181:20
behind 29:5, 34:5, 72:20
beings 286:22
believes 76:21, 101:16
Belmont 1:26
below 111:7, 117:9, 140:6, 140:11, 141:4, 145:22, 182:10, 187:4, 199:6, 219:21, 222:2, 239:9, 260:14, 260:15, 260:18, 274:18
beneath 116:14, 195:22
benefit 65:3, 90:5, 99:17, 279:10
benefiting 65:5
benefits 188:14, 226:17
Bent 53:5, 127:20
BEP 2:16, 2:17, 97:6
Bergen 285:3, 285:5
Bernacki 17:4, 17:23, 18:8, 96:9, 96:10
BERTOCCI 2:16, 6:19, 7:27, 11:16, 69:12, 69:13, 69:20, 70:5, 72:4, 72:23, 220:12, 232:3, 232:4, 233:21, 233:23, 288:16, 288:19
besides 66:18
best 27:22, 35:11, 91:14, 91:15, 107:22, 108:7, 151:19, 159:20, 181:1, 206:23, 222:7, 251:23
bestowed 286:19
Beth 2:12, 11:19
better 51:3, 59:8, 100:13, 153:6, 166:5, 192:13, 218:17, 258:14
Beyond 23:16, 26:4, 82:9, 84:5, 109:19, 110:10, 178:15, 202:4, 231:13, 259:21, 287:24
biased 229:4
Biddeford 5:10
bidding 203:7
big 22:2, 64:5, 76:16, 153:18, 183:5, 231:6, 284:16
bigger 63:21, 103:12, 216:7, 217:7, 217:8
biggest 101:24, 126:3, 204:16
billion 236:1, 236:2, 236:5, 281:2
biological 85:12, 100:22, 207:7
biology 102:5, 190:24
biomass 62:24, 222:8
bioreactors 214:20
bird 74:25, 98:11
Black 4:5
blast 33:8
blasting 10:14, 32:21
blend 217:9
block 12:17
blows 94:19
Bob 209:9, 273:23
bobolink 98:11
bodies 98:24
body 76:12, 96:7, 97:24, 99:3, 99:11, 279:13, 282:4, 282:14, 282:16, 282:17, 282:25
bond 58:19, 102:25, 103:5, 104:20, 104:24, 105:19
bonded 168:13
bonding 105:4
bonds 58:20, 58:21
booing 16:3
books 218:15

border 196:16
Bostonian 33:7
bottling 159:11, 159:14
bottom 21:4, 123:18, 123:22, 141:16, 185:22, 239:24
bought 43:22, 126:6, 127:4
bound 219:20
boundaries 175:22, 181:8, 181:24, 183:6
boundary 175:25, 177:1, 181:15, 182:5, 182:11, 182:20, 183:16, 184:4, 184:8, 189:1
bounds 59:5
box 183:5, 185:6
boxes 81:9
Bradford 162:14
brain 223:5
Braybrook 4:34
break 52:20, 60:9, 74:7, 94:22, 123:2, 123:3, 123:5, 123:9, 129:9, 251:10, 278:4
Break. 74:10, 95:1, 251:12, 278:10
breakdown 69:14, 71:10
breakeven 82:22
brevity 92:1
brick 22:21
brief 24:22, 24:24, 159:5, 272:14
Briefly 21:16, 72:19, 86:9, 92:22, 115:16, 175:4, 177:23, 184:10
bring 45:11, 86:13, 107:17, 167:11, 200:4, 204:14, 216:6, 218:16, 288:21
bringing 208:17, 245:18, 248:16
brings 120:3, 282:21
broached 195:10
broadly 95:9
Broderick 4:16, 13:16
broke 36:2
broken 35:25, 69:21, 129:15
broker 58:15
brought 29:19, 109:4, 151:8, 256:3, 260:7
brownfield 75:12
Bucksport 65:13, 75:12
budget 52:16
buffering 21:9
buffers 201:7
build 22:24, 29:1, 59:1, 75:15, 75:24, 97:22, 124:20, 217:5, 221:6, 284:21
build-out 9:24, 188:24, 198:21, 235:11, 250:10
build-up 216:19
buildings 21:15, 59:2
built 30:4, 31:11, 35:8, 37:1, 43:21, 61:25, 97:20, 100:25, 111:12, 126:24, 152:24, 202:19, 240:18, 246:8, 284:16
built-in 224:10
bunch 173:17
burden 163:20
Bureau 2:12, 2:13, 2:14, 2:15, 11:18, 11:19, 23:22
BURKE 2:17, 11:17, 19:17, 19:19, 19:25
Business 15:13, 18:1, 28:9, 57:22, 58:23, 59:1, 63:17, 82:5, 85:2, 85:5, 90:7, 91:3, 100:9, 101:5, 214:9, 221:6, 221:14, 221:23, 252:12, 269:22, 271:22
businesses 80:25, 83:15
butt 64:11
buy 206:2
buzzed 196:20

Caitlin 101:23, 285:18, 285:22
calamities 128:5
calamity 274:17
calculation 217:25
calculations 190:16
calendar 123:2
calibrate 210:12, 210:13, 229:16
calibrated 227:18
California 47:25, 48:1, 48:3, 48:4, 48:13, 50:7, 50:22, 83:18, 153:16, 271:23, 279:15, 279:24, 281:14
call 9:2, 10:8, 25:9, 28:16, 33:1, 60:5, 63:9, 131:2, 137:11, 212:19, 229:3, 240:15, 269:1, 282:12
Callahan 2:12, 11:19
called 18:12, 21:23, 26:6, 42:13, 123:22, 137:8, 160:18, 182:5, 182:6, 231:18, 232:25, 233:4
callous 280:18
calls 95:7
Camden 13:1
Canal 3:30
Canning 4:5
capabilities 28:5
capability 54:4, 54:7, 55:20, 55:23, 73:2, 85:15, 85:16
capacities 190:5, 190:19, 255:20, 258:5
Cape 161:13
capital 28:10, 36:11, 37:14, 39:10, 43:25, 60:7, 60:14, 60:15, 61:17, 61:19, 104:2
capture 120:22, 181:7
captured 212:6
carbon 98:5, 98:11, 98:13
care 105:10, 126:16, 261:15
Carnegie 36:24, 37:13, 37:16, 45:13, 73:8
carry 59:14
carrying 61:17
cart 98:13
carting 57:9, 58:12
case 12:10, 17:12, 58:8, 63:17, 86:21, 125:23, 153:15, 156:9, 156:14, 165:22, 176:12, 185:23, 187:10, 214:7, 222:5, 222:7, 226:1, 229:9, 237:23, 271:14, 271:25
cases 45:21, 47:1, 53:2, 92:25, 139:1, 185:18, 185:20, 239:13, 253:25
Caswell 162:14
catch 26:21, 278:18
categories 81:15
category 78:20, 101:9
caught 289:12
cause 18:18, 142:2, 174:2, 222:15, 262:10, 266:17, 274:17
caused 139:3, 268:12
causing 238:20
cautious 52:10
caveat 137:21
celebrity 107:1
cell 12:13, 12:15, 19:11
Center 1:26, 9:22, 22:22, 22:23
central 22:5, 23:2, 23:3, 62:1
centuries 32:7
CEO 285:13
Certain 77:10, 77:15, 122:1, 139:24, 148:25, 153:2, 155:14, 190:5, 190:8, 193:14, 196:9, 200:7, 203:16,

205:14, 234:18, 248:7, 249:9, 250:19, 257:19, 261:8, 265:10, 272:17, 272:25
Certainly 19:5, 52:1, 131:15, 145:18, 190:8, 191:15, 192:25, 218:1, 218:6, 218:15, 247:7, 247:8, 247:13, 262:9, 287:5
certified 80:15
certify 290:4
cetera 64:17, 239:17, 280:5
CFO 34:8
CFS 194:16
Chair 55:4
Chairman 24:19, 34:6, 92:20
chairs 288:22, 289:8, 289:9
challenge 90:9, 169:21, 228:24
challenges 100:24
challenging 169:25, 171:25
chance 274:14
Chancellor 279:14
changed 48:2, 261:22
changes 120:22, 121:17, 138:7, 138:22, 139:2, 151:1, 155:19, 157:19, 158:1, 164:9, 172:2, 176:8, 178:13, 203:12, 209:17, 225:1, 226:7, 233:9, 234:23, 235:1, 241:20, 244:14, 244:23, 247:6, 248:16
changing 203:19, 218:3, 249:22, 283:15, 286:2
Chapter 12:22, 13:5, 23:9, 33:3, 72:24, 86:1, 86:6, 93:18, 117:3, 117:8, 148:23, 257:9, 270:12
characteristic 231:16
characteristics 10:19, 114:3, 205:15, 212:25
characterize 141:22, 161:3, 241:9, 243:9
characterized 158:16, 240:14
characterizing 53:18, 243:11
charged 77:9
charges 211:17
Charles 5:6
chart 61:14, 81:12, 81:13, 81:14, 81:15
check 193:20, 212:15, 235:23
checked 81:9, 81:11, 82:14
checklist 79:13, 81:7
checks 228:10
Cheering 16:3
chemical 131:3, 132:16, 133:6, 133:16, 133:18, 133:20, 134:1
chemicals 130:5, 130:11, 130:21, 130:23, 130:25, 131:20, 131:22, 131:23, 133:7, 133:21, 133:23, 134:5
chemistry 157:19, 158:10, 160:19, 176:8, 206:8, 229:11
chill 226:15
chilling 22:7
chlorine 206:18, 206:25
choice 76:14
chose 149:2, 203:20
chuckle 253:8
chunk 173:4
CINDY 2:16
Ciomei 265:6
circled 245:8
circumstances 205:2, 224:11
cited 154:8, 285:17
Citing 82:18, 82:19

citizen 58:6, 59:9, 161:24
citizens 56:10, 56:16, 57:8, 58:11, 78:18, 162:25, 163:3, 164:3, 166:10, 283:17
City 21:8, 23:20, 25:1, 25:2, 85:7, 85:8, 85:10, 120:18, 134:22, 252:23
Civil 109:25
claims 265:13
clapping 16:3
clarification 95:5, 134:18, 135:4, 147:24, 169:6, 186:1
clarify 42:3, 54:25, 122:8, 147:22, 165:21, 185:11, 200:16, 241:23, 245:18, 279:2
clarifying 93:10
clarity 54:24
class 27:22, 35:11, 108:7
classification 163:5
clay 142:9
clay-like 75:23
Clean 23:25, 27:15, 102:16, 106:3, 107:18, 128:15, 129:2, 130:2, 130:11, 130:21, 131:22, 133:22, 163:14, 206:24, 214:15, 240:20, 286:1
cleaning 52:17, 52:18, 104:22, 130:16, 214:16
clear 46:5, 46:20, 75:1, 76:13, 79:8, 83:19, 108:5, 122:12, 152:13, 165:16, 201:21, 202:3
clearing 69:22, 72:7, 72:10
Clearly 12:4, 18:4, 47:7, 102:11, 103:23, 103:24, 164:3, 235:6, 257:9, 260:24, 265:17, 282:1
client 269:18
clients 75:1, 75:11, 85:2, 85:23, 89:24
climate 26:24, 27:5, 204:13, 210:7, 210:22, 211:11, 212:9, 226:7, 279:17, 279:25, 280:2, 280:24, 281:9, 286:3, 286:4, 286:7, 286:9, 286:14, 286:22
climatic 203:13, 203:14, 203:18, 204:10
clock 19:17
close 11:4, 18:1, 27:13, 29:23, 60:18, 94:19, 161:3, 162:18, 221:12, 247:3, 260:22
closed 245:14, 245:15
closely 34:23, 72:9, 235:7
closer 62:16, 184:16, 224:24
closest 160:23, 164:19, 238:9
closing 16:9
clumsily 240:9
co-authored 115:5
Coast 20:16, 25:12, 28:24, 162:18, 177:12
coastal 10:12, 162:11, 175:22, 175:24, 177:1, 259:24
coastlines 27:1
Cod 161:13
code 112:2
cohorts 109:2, 216:6
cold 27:15, 226:3, 226:5, 226:6
collaborate 34:22
collaborative 25:5
collapse 274:17
collateral 261:13
colleague 28:11

collect 16:18, 120:21, 135:25, 140:7, 164:22, 234:7
collected 116:2, 118:13, 141:3, 145:15, 234:25, 235:1, 248:11, 249:1, 266:24
collecting 113:6, 140:4, 228:25, 229:1, 229:2
collection 120:20, 172:20
collectively 139:9
College 114:21, 115:8
Colorado 114:20
column 96:4, 239:12
combination 34:21, 46:9, 71:3, 71:7, 208:11, 220:20
combined 75:20, 205:9, 219:10, 224:25
comes 55:10, 58:21, 112:10, 112:15, 112:19, 119:12, 153:16, 154:4, 166:22, 168:9, 193:24, 203:23, 220:25, 236:19, 241:12, 245:7, 271:24, 279:25
comfortable 68:7, 73:24, 200:25, 201:8, 219:11, 221:12
coming 26:22, 39:2, 41:21, 50:19, 68:17, 90:1, 108:11, 171:14, 171:16, 174:3, 176:25, 177:4, 178:22, 182:20, 205:21, 207:23, 209:12, 235:25, 236:13, 260:21, 260:22
comitted 50:25, 84:6, 121:10, 157:8
commence 113:7
commencing 1:27
comment 146:9, 178:8, 201:12, 208:15, 266:2
commenting 288:3, 288:5
comments 11:2, 27:23, 113:18, 113:19, 116:7, 132:12, 143:8, 211:6
Commercial 3:46, 20:12, 29:1
Commission 119:10, 290:15
Commissioner 2:9, 2:11, 11:14, 11:21, 20:3, 31:20, 109:11, 114:12, 255:10
commit 41:6
commitment 42:12, 42:14, 42:21, 45:22, 81:20, 81:22, 82:1, 82:8, 103:4, 163:8
commitments 64:18, 102:10
committed 43:15
commodity 64:23
common 112:1, 127:15
communication 121:9
Communications 2:18, 12:9
communities 38:6
community 37:5, 98:19, 98:22, 99:5, 105:1, 105:9, 241:3
companies 26:3, 31:2, 37:3, 38:21, 44:3, 50:4, 63:6, 71:21, 100:8, 101:21, 103:9, 285:8
compare 30:14, 108:2, 236:10
compared 31:2, 31:9, 63:11, 65:15, 108:3
comparison 117:19, 226:14
compartmentalize 129:11

compartmentalized 125:8
compensate 243:24
competence 282:5, 283:5
competencies 27:18
competency 282:22
competent 144:21
competition 173:14
competitive 29:5, 63:11, 63:18, 64:7, 101:1, 101:2
compilation 277:16
complete 77:25, 83:8, 83:13, 100:1, 102:20, 189:19, 288:14
completed 11:25, 34:16, 70:16, 81:10, 115:21
completely 75:5
completing 62:5, 73:18
completion 14:10, 62:4
complex 113:1, 155:19, 157:20
compliance 32:20, 77:25
complicates 229:21
complications 152:18, 152:20
compliment 92:16
complimentary 112:3
comply 17:13, 17:15, 69:10, 93:3
component 66:10, 68:24, 113:15, 155:24, 170:4, 183:21, 233:2, 233:5, 250:13
components 70:17, 165:10, 165:12, 207:7, 213:4, 230:10
composed 283:21
composition 10:19, 283:14
compounds 132:13
comprise 48:13
concentrated 114:23
concept 37:10, 37:20, 227:13
conceptual 211:8
conceptually 62:9
concern 191:17, 191:18, 244:13, 280:20, 283:4
concerned 59:10, 275:3, 283:17
concerns 73:16, 83:12, 83:14, 153:10, 246:22
concise 16:12
conclude 39:16, 265:16
concluded 137:15, 288:13
concludes 266:16
conclusion 141:15
conclusions 265:22
concurrently 83:17
conditional 39:17, 82:8, 86:1, 86:16
conditioned 67:17, 201:13
conditioning 105:18
conditions 28:4, 68:14, 69:1, 83:4, 86:5, 113:7, 113:9, 120:21, 120:22, 135:15, 165:3, 173:5, 173:22, 186:5, 193:1, 193:5, 198:23, 203:11, 211:22, 215:5, 223:19, 229:12, 229:17, 230:19, 246:25, 257:7, 260:11, 262:5, 276:14
Conduct 12:23, 15:24, 16:5, 118:12, 158:17
conducted 116:1, 118:6, 119:7, 121:20, 150:10, 162:8, 172:23, 204:2
conducting 78:17, 115:2, 115:7, 165:25

conductivity 157:1, 177:6, 191:12, 191:16, 267:8
conference 17:6, 17:21, 95:6, 289:7
confidence 67:25, 68:15, 190:20, 253:14
confident 38:13
configuration 61:24, 238:4, 247:11
configured 118:23
confine 59:5, 284:4
confirm 170:17, 170:25, 253:13
confirmed 37:9
confused 199:16
confusion 122:9
conglomerate 50:3
congratulate 278:6
Congratulations 106:20
Congress 4:26
conjunction 36:17, 48:3
connect 171:6, 177:11, 241:4
connected 156:13, 156:16, 177:11
connecting 121:18, 231:14
connection 145:5, 186:18, 194:19
connectivity 63:15, 177:2
connects 237:2
consequence 152:21, 225:21
consequences 156:4
Consequently 75:25
Conservation 18:13, 23:22
conservative 117:17, 158:5, 174:11, 204:10, 248:20
conservatively 149:3, 204:15
consider 16:17, 18:16, 42:16, 101:3, 156:17, 234:5, 276:17
considerable 41:21, 100:4, 100:7, 102:12, 105:24, 156:10, 285:7, 285:25
considerably 214:13
consideration 18:1, 20:7, 114:13, 142:23, 142:24
considered 178:1, 223:19, 223:20, 241:13, 246:11, 260:19
Considering 119:18, 139:16, 232:18
considers 145:24
consist 18:3, 113:5
consistency 227:21, 227:25
consistent 66:2, 169:24, 204:12, 248:7
consisting 17:4
consists 75:22, 119:20
consolidating 63:12
constant 149:18, 182:5
constantly 278:21
constitutes 88:20
constrain 57:25
constraint 250:20
constraints 16:11
construct 135:19
constructed 76:3, 78:8, 111:25, 118:16, 135:16
constructing 110:20, 144:13
Construction 32:16, 39:9, 45:10, 62:5, 69:5, 73:13, 73:14, 73:25, 84:9, 86:19, 102:20, 140:12, 178:11, 193:8, 193:10, 216:22, 216:24, 217:20, 234:4, 234:5, 235:14, 244:25,

247:2, 249:8
consultant 254:4
consultants 254:5
Consulting 114:18, 136:3, 255:21
consume 26:20
consumer 27:12, 27:13, 163:20, 165:17
consumers 27:14, 65:17
consumption 26:16, 65:15
consumptive 244:7
cont. 4:2, 5:2
contact 12:10
contacted 166:9, 166:10, 264:15
contacting 166:22
contains 114:5
contaminated 102:17, 102:18
contamination 126:8
contemplate 203:17
contemplates 86:16
content 86:10
contents 81:4
context 24:24, 26:13, 235:3, 256:19
contingencies 66:18, 120:7, 138:18, 139:1, 139:6, 258:16
contingency 113:8, 138:6, 138:22
continual 51:9
continually 234:25
Continue 53:21, 56:13, 56:15, 98:17, 120:19, 150:13, 186:20, 250:15, 284:13
continued 265:14, 289:21
continuing 150:4, 281:24
continuous 194:5, 194:8, 194:9
continuously 152:14, 195:12, 243:18
contracted 165:23, 166:6
contractor 166:24
contracts 88:6
contrast 75:10
contribute 27:10, 100:19
contributed 162:20
contributing 112:20, 178:9, 237:8
Control 9:13, 10:13, 72:12, 176:6, 214:7, 278:21, 281:1
controlled 72:16
controls 72:8, 108:21
conversation 265:8, 276:1
conversations 190:20, 218:16, 265:11, 265:21, 275:23, 276:17, 278:17
cooling 189:4, 226:20
Coordinator 11:20
Copies 11:23, 13:20, 99:18
copy 14:12, 99:19, 242:17
core 66:12, 158:16
corner 21:4, 160:13, 203:1
corporate 46:2, 47:3, 47:5, 47:21, 48:8, 49:14, 50:15, 82:24
Corporation 3:26, 13:12, 26:1, 40:3, 47:2, 47:23, 74:18, 74:19, 84:1, 163:21, 255:23, 287:15
corporations 99:4, 99:7, 283:11
Corps 23:24
corrected 97:18
correctly 41:4, 57:24, 127:10, 130:22, 134:19, 136:15, 137:5, 195:22, 196:13, 243:12
correspondence 192:24, 288:2
costs 44:5, 60:12, 63:15, 69:15, 81:12, 81:13, 91:7,

207:8
council 25:1
Counsel 11:15, 14:7, 17:2, 53:21, 58:1, 87:10, 131:7, 141:11
counseling 85:5
counting 90:10
countries 25:24, 96:3
country 163:19
County 99:2, 282:20
couple 27:23, 51:23, 65:21, 96:16, 97:12, 156:7, 159:4, 195:15, 195:20, 204:22, 214:12, 249:7, 270:3, 287:8
Courier 13:2
course 15:8, 38:25, 66:20, 77:13, 112:24, 114:5, 116:6, 117:24, 154:23, 167:1, 171:25, 174:18, 197:25, 212:14, 281:15
Court 1:24, 11:25, 278:12, 290:2, 290:13
courtesy 15:25
cover 52:6, 167:23
coverage 102:10
covered 14:19, 71:2, 71:3, 140:13, 140:21, 142:8
covers 75:19
cracks 260:23, 262:6
crated 22:4
create 27:7, 48:6, 118:15, 198:2, 206:8, 246:20
created 60:1, 111:9, 253:11
creating 22:11, 27:3, 27:4, 27:21, 65:17, 68:15
creation 33:17, 110:8
credentials 274:7
crew 102:5
crisis 280:24, 286:3, 286:4, 286:7, 286:9, 286:14, 286:22
criteria 10:4, 10:6, 11:2, 11:5, 16:13, 40:14, 68:3, 77:10, 121:3, 241:18, 254:20
criterion 33:15
critical 27:16, 63:9, 76:22, 108:18, 192:3, 193:25, 249:23
Cross 39:21, 39:23, 51:20, 84:18, 91:25, 103:16, 263:1
Cross-examination 14:3, 14:11, 14:16, 123:11, 123:24, 134:16, 287:3
cross-examine 52:5
cross-examining 12:3, 289:1
crux 32:19
crystal 115:3
ctilburg@une.edu 5:12
curious 80:25
current 31:1, 38:2, 39:6, 113:25, 139:2, 145:21, 150:2, 171:23, 172:23, 178:16, 195:1, 229:17, 252:8, 252:15, 254:9, 254:18, 276:13, 283:19
Currently 20:15, 23:18, 26:3, 28:21, 38:17, 57:1, 100:18, 100:23, 113:24, 129:17, 141:1, 141:2, 142:7, 146:13, 150:19, 158:21, 166:13, 178:15, 192:18, 194:12, 195:14, 195:18, 195:23, 197:10, 202:2, 213:15, 252:18
Curtis 3:29, 40:2, 74:16

curve 30:21, 63:4, 233:15
customer 119:5, 254:15
cut 102:21, 204:6
cutting 115:7
cycle 21:22
cycles 207:3
Cynthia 11:16

< D >
DACF 23:23
dad 32:5
Daily 13:1, 280:10
damage 98:18, 196:4
damaging 274:14
dams 256:10, 256:16, 258:24, 259:13, 259:15, 260:5, 260:9, 261:3, 261:11, 261:17, 261:19, 262:1, 262:15, 262:16, 263:4, 263:8, 264:13, 265:1, 265:14, 265:16, 266:7, 270:8, 274:7, 274:22
dangerous 133:17
Danish 29:7, 40:23, 41:15, 41:16, 127:20, 160:7
data-based 228:9
dataset 120:22, 120:25, 229:3, 229:13, 229:15
datasets 229:7
date 18:17, 18:19, 18:22, 77:18, 263:21
DATED 143:16, 290:17
David 2:18, 3:15, 4:5, 12:8
Dawn 2:13, 11:19
DAY 1:15, 10:1, 27:14, 31:22, 77:5, 282:11, 283:12, 283:13
days 32:21, 34:1
daytime 13:8
dbraybrook@yahoo.com 4:38
deadline 18:14
deal 71:5, 103:11, 162:22, 206:3, 226:20, 226:23
dealing 54:7, 55:3, 55:6, 57:20, 185:23, 229:19, 257:22
dealings 16:1
deals 34:17, 46:8, 91:10, 131:10
dealt 57:13, 258:4
dearly 98:20
death 281:21
debating 27:25
Debt 34:22, 37:12, 37:16, 37:17, 37:20, 39:4, 39:6, 39:9, 39:14, 61:15, 68:24, 71:4, 71:7, 71:11, 71:13, 86:4, 89:8, 168:18
decade 232:13
decades 26:16, 32:18, 96:12
December 260:8, 263:16
dechlorinated 206:22
decided 150:21
deciding 91:4
decision 16:21, 73:22, 99:3, 249:4, 282:18, 283:1
decisions 144:11
decline 212:4, 243:16, 243:17
declined 58:9, 58:18, 103:4, 166:11
decrease 209:15
decreasing 152:17, 188:16
dedicated 82:9
deep 239:9
deeper 144:22, 185:1
deepest 145:6
deeply 284:6, 284:10
default 78:7
defend 98:19
defending 98:22
deference 64:13
define 174:1, 259:13, 261:11
defined 42:13, 182:6, 219:10, 258:20
definite 178:13

definitely 91:8, 91:12, 186:4, 207:10
Degree 20:9, 109:21, 109:23, 112:13, 114:20, 114:21, 122:1, 182:17, 233:1, 255:17, 255:18, 267:3, 272:18
degrees 109:21, 226:19
Delaware 84:1
delayed 109:2
Delemos 4:35
deliberations 282:14, 282:17, 283:1
delivery 65:8
demand 64:25, 118:2, 120:2, 169:21, 188:12, 204:24, 205:18
demand/supply 65:2, 65:9
demands 122:20, 280:3, 281:10
demonstrably 282:24
demonstratable 90:24, 90:25
demonstrate 40:7, 40:15, 42:15, 46:22, 69:2, 69:6, 69:10, 90:21, 90:23, 101:6
demonstrated 10:3, 10:25, 39:19, 84:11, 93:2, 93:5, 93:7, 149:15, 227:4, 266:18
demonstrates 102:11, 155:1, 266:16
demonstrating 36:13, 43:21, 47:6
demonstration 211:8
demonstrative 17:19
denied 18:14, 282:7, 284:10
Denmark 29:3, 30:1, 35:11, 41:22, 43:22, 45:18, 53:8, 66:5, 82:6, 96:2, 97:21, 126:4, 127:2, 127:21, 127:23
denotes 61:16
density 146:21, 146:22, 158:12, 161:17, 228:17, 229:5
DEP 2:8, 2:9, 10:4, 10:24, 11:3, 68:1, 105:14, 107:3, 113:18, 123:19, 123:22, 165:6, 165:7, 166:21, 167:1, 168:22, 234:23, 234:24, 234:25, 235:3, 253:15, 278:12
depend 84:1, 199:17
dependable 90:16
dependent 149:19, 150:12, 158:12, 162:7, 228:17, 259:12, 261:16
depending 176:21, 216:22
depends 46:14, 73:5, 128:19, 208:9, 234:14, 235:6
depictions 105:22
deposit 142:8, 142:10
deposits 178:16, 186:3, 204:3
depth 76:2, 88:18, 239:9, 239:25, 240:3, 240:4, 244:25
depths 239:21
derive 135:23
derived 135:21, 253:12
descending 286:15
describe 113:14, 116:25, 132:9, 161:9, 161:10, 167:13, 171:3, 177:24, 236:19
described 50:9, 126:2, 156:9, 171:9, 210:14, 224:8, 226:3
describes 61:14
describing 11:4, 47:5, 211:7

description 138:11, 139:9, 139:13, 175:3
descriptive 109:18, 114:3, 180:2
design 20:11, 31:4, 35:12, 41:16, 43:22, 55:17, 55:18, 97:23, 115:17, 199:2, 202:21, 218:15, 220:5, 232:18
designed 20:22, 120:10, 190:22, 220:2
designing 28:18, 31:6, 115:15
designs 108:5
desirable 77:21, 202:21
desperately 286:17
desperation 280:14
despite 82:18, 162:17, 281:16
destroy 98:8, 98:11, 99:8, 106:1, 280:13
destroyed 76:10, 102:22, 105:2
detail 81:17, 82:17, 91:19, 107:13, 111:17
detailed 86:17, 111:13, 114:1, 114:7, 115:22, 143:11, 233:20
details 17:20, 115:25, 122:5, 277:25
detected 121:12
detention 140:9
deterioration 265:15
determination 14:22, 75:8
determinations 142:25
determine 235:6, 268:11, 269:10
determined 145:14, 148:12, 234:14
develop 25:14, 112:18, 116:18, 139:1, 139:6, 144:10, 171:12, 174:15, 209:5
developed 30:17, 30:22, 60:4, 121:23, 140:13, 155:23, 212:24
developer 42:14
developers 101:6
developing 26:7, 113:7, 121:10, 138:17, 177:15
developments 63:25, 86:12
develops 233:16
devices 12:13, 102:16
devoted 83:19
devour 98:7
Diane 4:34
difference 105:3, 105:10, 209:25, 216:7, 237:4, 241:12
differently 181:20
difficult 156:8, 157:22, 158:9, 158:11, 230:3, 258:4, 278:17
difficulty 102:12, 184:12, 211:10
dilution 146:18
dimension 26:23, 231:24
dimensional 144:10
dimensions 144:18
direct 12:2, 37:15, 38:11, 49:8, 135:4, 136:11, 138:16, 142:12, 143:7, 144:2, 178:14, 232:8
directed 92:23, 166:5
direction 158:4, 172:2, 229:4, 231:15
directives 17:14
directly 131:19, 133:11, 134:4, 142:14, 178:17
Director 2:15, 2:18, 5:8, 11:18, 12:9, 34:11, 114:11, 222:8, 255:21

directory 141:3
disagrees 33:16
disappointed 282:11
Discharge 9:23, 9:25, 10:18, 10:20, 10:21, 23:11, 31:8, 32:24, 32:25, 33:2, 74:21, 77:3, 77:4, 77:5, 107:20, 117:20, 117:22, 140:9, 141:20, 141:21, 159:24, 160:1, 160:9, 205:16, 236:4, 236:8, 284:5
discharged 141:4, 141:23, 180:11, 236:6, 236:12
discharging 140:5, 178:24
disclosed 49:14
disconnected 186:15
discovered 126:12
discreet 158:14, 158:15
discretion 18:16
discuss 194:25
discussed 17:20, 36:9, 48:23, 64:17, 109:13, 148:21, 150:22, 167:4, 167:17, 200:13, 258:23
discussing 62:22, 164:2
discussion 207:21, 252:2, 259:23
discussions 195:5, 222:5, 256:15
disease 29:14, 52:19, 125:5, 125:15, 126:5, 126:8, 127:3, 127:13, 130:3
disperse 131:21
displace 124:7
displacing 65:16
displayed 105:24
dispute 149:23
disregard 103:6
disrepair 262:2, 265:14
disrespect 131:8
disservice 282:19
distilling 196:6
distinction 232:22
distinctly 232:23
distinguish 145:1
distributed 118:21, 185:13
disturb 48:9
disturbed 178:11
dive 284:6, 284:9
diverse 27:7, 74:25
diversify 27:10
diversion 177:24, 178:3, 179:18, 180:8, 180:17
diversity 121:24
diverted 178:23, 205:22
diverts 180:21
divide 181:16
DK 40:24, 41:3, 42:9
dkallin@dwmlaw.com 3:21
dl_broderick@hotmail.com 4:21
DMR 23:23
doctor 169:14
document 73:11, 116:8, 120:20
documentation 73:3, 86:18, 276:10
documented 83:22, 264:18
documents 115:22
doing 19:16, 24:11, 31:2, 32:7, 32:17, 34:4, 39:8, 56:6, 59:7, 59:17, 72:20, 91:25, 106:16, 151:25, 158:24, 179:5, 181:4, 188:17, 193:13, 194:12, 195:2, 203:9, 217:18, 226:16, 253:22, 253:24, 255:19, 256:12, 265:23, 278:7
dollar 72:1

dollars 25:3, 44:18, 84:23
domain 144:12, 144:16, 204:4
domestic 65:11, 65:14, 65:15
dominion 240:15
don@gmri.org 3:49
Donald 3:45
Donna 4:16, 13:15
doorway 12:19
doorways 12:17
Dostie 1:23, 11:25, 12:1, 290:2
double 26:15
double-check 195:16
doubling 215:9
doubt 77:14, 100:4
Downeast 32:4
downward 244:1
dozen 63:3
dozens 102:22, 131:23
drain 128:16
drainages 180:13
drains 140:3, 140:10, 140:18
dramatic 209:17, 210:1
DRAPER 2:2, 6:15, 7:18, 11:11, 61:12, 61:13, 169:2, 169:4, 169:5, 169:13, 170:7
draw 106:25, 111:3, 167:18, 198:17, 221:5, 240:22
drawdown 112:12, 112:17, 146:3, 148:24, 171:11, 171:19, 171:20, 171:23, 173:20, 174:14, 174:16, 187:3, 232:6, 232:9, 233:13, 233:16, 236:24, 236:25, 237:1, 237:5, 237:24, 238:2, 238:6, 238:23, 239:4, 241:13, 241:15, 244:11, 244:12
drawdowns 147:11, 171:12, 238:24, 244:20
drawing 179:25, 202:15, 241:7
drawings 72:10
drawn 162:1, 187:7
drew 226:5, 281:20
drift 284:3
drilled 148:4
drilling 118:7, 118:9, 229:1, 266:24
drinking 246:13
Drive 4:9, 4:17, 240:9
driveway 21:5
drop 101:15
drops 169:23, 182:10
drought 151:23, 198:14, 210:23, 211:1, 211:24, 226:23, 279:18, 280:3, 281:10, 281:14, 286:12
Drummond 3:7, 3:16
dry 186:16
dryer 177:3
due 120:22, 151:21, 175:9, 226:6, 280:2, 281:9
duly 155:6
dump 76:7, 77:2
duration 117:15
During 13:8, 15:8, 15:13, 18:24, 34:15, 61:22, 68:1, 116:11, 169:19, 176:16, 177:6, 191:11, 196:2, 197:14, 202:14, 216:16, 237:15, 237:20, 238:2, 238:12, 238:18, 247:2, 262:5, 266:24, 276:5
duty 286:19
dwarfs 200:1
dynamic 65:4

< E >
E. 5:6
earlier 37:18, 37:19, 90:5, 97:13, 98:13,

104:6, 104:18, 134:5, 148:22, 151:9, 161:16, 163:13, 176:10, 180:7, 193:9, 203:22, 240:12, 240:21, 261:21, 262:11, 267:15, 277:14, 279:3, 281:13
early 41:17, 42:1, 100:19, 100:22, 123:3, 123:4, 206:20, 207:3, 247:2, 247:14
earnest 46:7
earnings 51:8
earthwork 70:16
easiest 64:24
easily 284:24
East 20:16
east/west 231:20, 231:21
Eastern 161:2, 281:6
easy 173:22, 217:18
economy 26:25
Ed 24:10, 119:23, 152:25, 163:25, 166:5
edge 21:12, 115:8
edicts 98:23, 98:25
effect 142:11, 155:2, 158:5, 161:24, 174:17, 198:3, 231:12, 236:24, 238:12, 238:15, 238:21, 240:5, 240:7, 257:10, 257:12, 266:20, 268:24, 269:6, 270:14, 270:18, 274:18, 279:4, 287:24
effective 258:13
Effectively 139:19, 172:4, 174:19, 186:14
effects 135:12, 138:7, 138:23, 139:3, 146:2, 146:18, 155:7, 155:9, 161:11, 173:7, 173:11, 173:18, 237:14, 244:20, 253:14, 277:15, 277:16
efficacy 256:4, 257:1
efficiency 14:6, 151:15, 220:3, 225:25
efficient 108:1, 283:9
effluent 10:20, 85:8
effort 25:5, 36:18, 111:5, 111:15, 114:4, 157:24, 158:18, 161:19, 172:24, 210:17, 223:21
efforts 111:23, 227:20, 227:21
egg 21:25
eggs 45:11, 62:3, 62:7
Eighth 17:9
either 103:6, 126:5, 127:3, 140:17, 219:2, 230:15
EKF 40:18, 40:23, 41:1, 41:6, 41:8, 41:18
elapsed 19:21
elapses 234:22
Eleanor 4:16, 13:15
electrical 85:6
electronic 12:13
element 202:23
elements 21:2, 175:5, 175:7
elevation 243:17, 244:14, 245:4
Elimination 23:11, 32:25
ellie@greenstore.com 4:20
elongated 236:25, 237:1
elsewhere 99:10, 216:10
elucidate 181:5
email 18:10, 279:13, 279:16, 280:6, 281:8
emergencies 126:16,

127:12
Emergency 12:16, 22:6, 23:13, 260:12
emerging 27:24, 30:19
eminent 274:16
Emissions 10:16
emphasize 35:8, 256:13
employee 25:22, 47:10, 128:4
employees 47:13
employer 53:5
empty 125:9, 126:22, 129:24
encompass 211:13
encourage 56:2
end 19:23, 20:18, 29:17, 40:17, 48:9, 55:13, 62:12, 106:18, 133:7, 137:22, 180:8, 221:12, 221:13, 225:23, 233:3, 235:14, 239:23, 241:19, 248:3, 248:5, 248:21, 284:19
endeavor 211:14
ended 27:6
ending 248:21
ends 180:12, 180:13
enforcement 78:10
enforcing 77:9
engaged 43:22
engagement 259:17
engagements 259:23
engineer 124:2, 274:11
Engineering 20:10, 109:24, 109:25, 190:16, 190:21, 255:18, 274:7
engineers 263:24
England 5:4, 5:7, 13:14, 29:20, 110:10
enlarged 17:10
enormous 98:5, 126:1, 281:19, 287:23
enormously 279:7
enough 22:2, 28:13, 82:17, 91:18, 91:19, 102:20, 104:5, 126:16, 197:20, 243:19, 258:13, 268:2
ensure 103:1, 104:21, 107:22, 164:8, 221:15, 254:4
enter 37:25, 217:12
entered 68:24
entertain 101:11, 282:12
entire 12:6, 44:8, 52:17, 70:10, 70:11, 76:2, 76:9, 82:3, 118:2, 140:4, 150:15, 169:7, 281:1, 281:22, 282:20, 286:18
entirely 145:14, 248:15, 249:5, 279:10
entities 13:4
entitled 100:12
entity 18:12, 18:17, 35:18, 41:14, 41:22, 47:21, 48:13, 48:14, 50:5, 282:2
entrepreneurs 78:3
Environment 25:9, 99:9, 105:2, 146:11, 151:1, 175:21, 182:2, 229:20, 279:14, 286:2
Environmental 1:3, 1:5, 3:36, 9:4, 11:9, 29:6, 31:12, 32:15, 32:18, 33:14, 66:11, 70:17, 72:7, 77:9, 109:24, 113:1, 122:23, 255:18, 255:22, 257:10, 257:12, 276:12
environments 162:13
envision 48:11
equal 91:25, 117:13, 169:20
equally 101:21
equipment

41:17, 41:23, 42:18, 70:20, 164:13, 164:16, 164:19, 195:17
Eric 24:10
erosion 10:12, 72:12
Ervin 4:8
ES 72:9
ESA 276:16
escapes 29:15
especially 157:22, 289:3
Esq 3:6, 3:15, 3:28, 4:8
essence 259:11
essential 82:23, 85:20
essentially 35:20, 37:16, 37:24, 50:4, 62:11, 69:8, 70:23, 71:11, 71:14, 106:1, 181:14, 181:21, 182:9, 244:6, 248:9, 253:16
establish 54:6, 121:3, 127:15, 130:9, 226:24
established 18:18, 60:16, 60:17, 60:21, 134:4, 164:8, 193:6, 215:17, 230:19
establishing 249:25
establishment 60:3
estate 34:14
estimate 81:18, 112:17, 117:18, 125:3, 125:12, 125:20, 170:22, 170:23, 212:25, 236:5, 238:24
estimated 69:15, 69:16, 81:11, 112:16, 117:4, 117:19, 117:22, 148:5, 171:11, 213:9, 232:12, 281:2
estimates 76:7, 111:16, 112:11, 129:22, 149:3
estimating 90:25, 155:18
et 64:17, 239:17, 280:5
Europe 29:19, 64:22, 66:11
European 29:6
evaluate 9:8, 10:25, 120:25, 145:16, 146:24, 239:18
evaluated 166:15, 249:18
evaluating 77:18
evaluation 119:8, 262:16, 262:17, 275:16
eve 18:13
evening 15:5, 287:7, 288:23, 288:25
event 52:7, 125:5, 125:14, 129:21
events 113:9
eventual 107:20, 265:16, 266:19, 282:18, 283:1
eventually 256:14
everybody 19:11, 52:11, 88:15, 114:9, 186:9, 218:19, 278:6
everyone 80:12, 96:21, 107:5, 109:9, 134:13, 175:14, 289:12
everything 63:16, 79:6, 98:18, 131:4, 150:5, 165:8, 181:7, 278:18, 285:14
evidence 9:8, 10:9, 10:15, 10:17, 11:2, 13:9, 16:17, 42:21, 47:4, 67:18, 155:1, 171:16, 176:14, 227:10
evident 231:19
evolved 116:6
evolving 283:15
exact 60:10, 62:9, 221:8, 221:24, 231:9, 231:10, 231:24, 231:25
Exactly 59:16, 90:17, 91:6,

91:7, 181:17, 221:8, 221:18, 232:16, 276:4, 283:17
Exam 6:7
Examination 6:11, 6:24, 7:5, 7:14, 8:6, 8:15
example 63:1, 63:12, 64:1, 139:2, 151:13, 183:20, 183:24, 205:10, 214:4, 221:1, 221:4, 225:12, 234:16, 262:3
excavate 75:25
excavation 72:7
exceed 159:9, 205:18
exceeded 38:16, 121:13, 191:20
exceeds 169:20
except 206:3
exception 63:25, 77:12, 237:21, 271:13
Excerpts 17:17, 18:5
excess 202:4
excessive 133:20, 133:23
exchange 28:14, 38:8, 71:24, 91:10, 92:3, 92:5, 107:22, 209:13, 209:16, 217:18
exchanging 152:13
excited 30:3, 31:21
exclude 238:21
excluding 16:6
exclusion 96:8
exclusively 189:2
Excuse 69:17, 81:13, 88:11, 96:18, 97:25, 143:8, 223:11, 244:1, 273:11, 281:12
Executive 2:16, 11:16, 101:4, 101:12, 285:19
Exhibit 18:4, 19:14, 20:19, 20:25, 79:19, 143:12, 242:24
exhibits 17:8, 17:10, 17:16, 17:18, 17:19, 18:3
exist 147:15, 150:4, 261:3, 261:5, 261:6, 261:11, 262:1
existence 87:22, 259:10, 261:17
Existing 10:13, 21:5, 21:6, 21:10, 22:18, 22:21, 36:22, 37:23, 38:17, 48:22, 51:5, 115:19, 119:6, 120:10, 121:1, 122:4, 150:3, 155:13, 166:9, 197:10, 197:11, 204:24, 244:10, 245:5, 252:22, 260:10, 272:11, 275:19, 276:12, 287:21
exists 101:16, 259:10, 259:12, 260:24
exits 12:16, 12:18
expand 64:23, 72:5, 215:23
expansion 61:2
expansions 66:8
expect 37:21, 39:12, 39:18, 58:22, 62:3, 69:8, 71:20, 73:9, 89:19, 90:18, 117:25, 156:15, 177:17, 190:4, 205:17, 210:19, 215:21, 220:1, 254:14
expected 15:24, 70:25, 82:17, 155:5
expecting 70:8
expects 45:14
expeditiously 250:25
expenses 72:11, 90:1
expensive 81:1, 272:10
experience 20:11, 27:20, 28:5, 31:4, 31:5, 80:24, 88:20, 89:20, 106:2, 110:1,

110:6,
114:23,
115:2, 153:5,
153:15,
157:17,
228:23
experienced
162:17,
241:16,
286:11
experiencing
160:16
experimental
100:8
expert 53:6,
101:23,
127:20, 285:4
expertise
28:17, 28:19,
29:9, 92:17,
101:7,
139:17,
209:20
experts 46:12,
131:9, 132:8,
132:14,
132:16,
132:19,
177:23
Expires 290:15
explain 88:19,
186:8
explained 41:13
explaining
202:1
explanation
81:16
explicit 176:14
explicitly
143:23,
147:1,
161:18,
176:5, 176:8,
213:6, 238:20
exploit 99:8
exploration
115:1
explore 115:11,
147:19
exporters 40:24
exports 40:25
exposed 146:4
exposing 103:12
express 41:1
expressed
285:7, 285:13
extend 160:25,
231:22
extended 205:1,
205:5
extending
173:11
extends 231:12,
231:20
extensive
118:6,
172:24,
201:25
extensively
95:25, 100:6
extent 177:24,
195:10,
197:10,
240:23,
244:25,
246:2, 246:5,
257:19
external 25:20
extra 130:10,
131:21,
205:21
extracted
137:17,
148:16,
159:10
extraction
120:23,
256:22,
256:24
extractions
115:18
extremely
101:6,
133:17,
158:11, 229:3
eye 133:16,
176:11
eyes 133:17,
165:24
eyewear 133:19

< F >
face-to-face
31:25
faced 218:8
facilities
28:18, 34:19,
35:12, 39:6,
62:2, 64:6,
65:22, 66:8,
67:1, 78:8,
92:11,
100:18,
100:20,
100:25,
104:15,
107:15,
107:25,
108:2, 108:4,
159:11,
159:14,
215:23,
222:18,
225:23,
284:20
facing 274:17,
289:9
fact 37:10,
38:19, 38:23,
41:15, 41:20,
76:9, 87:16,
97:18,
104:20,
107:16,
110:10,
127:23,
128:5,
149:22,
154:12,
164:7, 180:7,
228:9,
248:17,
251:25,
271:5, 277:4,
277:9, 284:17
factor 27:21,
122:9, 179:2,
198:17
factories

105:23, 129:16
factoring 218:12, 234:1
factors 102:4, 179:10, 203:13, 203:14, 203:19, 284:5
factory 53:8, 98:4, 100:2, 124:6, 124:21, 126:3, 127:2, 127:22, 128:14, 283:8, 283:11
facts 16:21, 52:14, 269:12
fail 104:17, 262:10
failed 76:22
failure 149:23, 165:1, 265:16, 274:14
fair 16:9, 48:24, 70:2, 71:20, 140:11, 178:12, 192:6, 256:7, 257:2
Fairchild 34:11, 34:15
faired 216:18
fairly 200:17
faith 287:15
fall 96:1, 211:15, 211:18, 239:24
fallacy 196:25
fallen 265:14
falling 142:13, 243:22, 262:3
falls 101:8, 141:2, 163:5, 163:20, 184:7
false 97:21, 282:16, 282:24
familiar 22:20, 79:13, 132:10, 132:23, 139:23, 154:13, 154:17, 159:13, 161:14, 190:18, 234:16, 273:1
familiarity 93:18
family 37:2
famous 251:21
far 35:3, 35:15, 55:14, 102:2, 103:3, 130:12, 139:9, 148:8, 150:9, 188:3, 188:10, 276:24, 283:23, 287:24
farce 283:3
farm 26:7, 26:8, 26:9, 32:12, 65:13, 65:14, 75:18, 128:18, 160:6
farmed 26:20, 187:24, 283:8, 283:11
farming 26:23, 28:1, 28:2, 100:20, 101:13
farms 28:22, 30:13, 30:14, 35:9, 37:10, 37:11, 43:21, 53:3, 60:1, 60:3, 63:13, 63:24, 65:12, 75:16, 97:21, 97:22, 100:13, 103:11
farther 231:22
fast 286:2
fatally 75:6, 76:18, 282:18, 283:2
fault 220:10
favorable 204:17
feasibility 81:17
feature 145:13, 186:14
featured 178:25
features 144:17, 183:23
February 264:4
feces 98:6, 214:14, 282:11, 283:18
federal 50:3
feed 108:25, 214:23, 283:12
feeding 214:11, 214:21, 225:2
feel 68:7, 75:4, 75:6, 75:7, 90:16, 122:13, 171:24, 219:11, 289:2
feeling 170:11
feels 90:5
feet 22:17, 22:18, 76:2, 106:1, 118:8, 147:10, 148:5, 239:8, 239:10, 239:11, 239:22, 241:15, 244:15, 252:21, 260:15
felt 262:12
Fenway 75:20

few 25:3, 25:4, 28:12, 34:1, 39:24, 40:4, 105:25, 111:23, 113:14, 116:25, 209:25, 221:2, 226:19, 288:16
fickle 162:22
field 116:1, 227:20, 276:24
Fifth 83:1
Figure 43:2, 44:6, 60:10, 77:17, 77:20, 106:6, 149:18, 150:23, 223:13, 242:3, 243:1, 243:6, 246:17, 249:20, 258:11, 285:10
figured 129:21
figures 144:24, 285:8, 285:12
figuring 199:5
file 15:11, 15:12, 15:15
filed 13:17, 275:5
files 260:10, 275:2, 275:18, 276:6
filing 48:25, 49:17
fill 125:9, 126:22, 195:21
filter 154:2
filtering 214:17
filters 107:19
filtration 23:15, 151:20, 153:20, 230:25
final 22:4, 45:8, 67:15, 67:21, 172:25, 249:4, 272:15
finalizing 122:5, 166:13
Finally 27:19, 28:9, 28:15, 31:23, 70:21, 213:18
finance 39:3, 57:23, 83:16
financed 71:19
financially 56:19
financials 80:25
financing 34:24, 34:25, 35:3, 39:17, 39:18, 41:4, 41:7, 41:11, 44:8, 45:8, 46:6, 47:7, 66:6, 66:21, 66:23, 68:18, 70:1, 72:24, 73:11, 82:16, 83:4, 84:10, 84:24, 90:24, 100:12, 101:3, 102:20
find 93:1, 105:10, 122:16, 123:17, 123:21, 160:21, 199:18, 245:1, 274:5, 274:13, 276:3
finding 38:10, 38:22, 227:2, 227:3, 227:9
findings 118:19
fine 46:21, 49:10, 106:16
finish 129:1, 262:23
finished 94:14
finite 181:7, 185:7
fired 96:5
fires 281:2, 281:3
firewall 209:23
firm 35:12
firstly 156:19
fisheries 10:22
fishway 74:25
fit 37:15, 88:25
Five 30:18, 34:15, 34:18, 74:7, 81:9, 94:23, 95:12, 95:13, 121:5, 249:12, 251:10, 282:9
fix 241:5
flawed 282:18, 283:2
Fletcher 265:6, 265:9
flexibility 71:23, 72:2, 121:25, 126:21, 188:15, 191:3, 200:20, 200:23, 209:4, 209:7, 215:18, 218:2, 218:5, 221:15, 222:25, 246:4, 255:2
flexible 122:21, 248:19
flood 205:10, 205:11
Florida 26:8, 63:19, 226:14

flow-through 107:15, 209:21
flowed 138:1
flowing 180:14, 260:20
flows 141:1, 182:14, 183:11, 184:24, 194:23, 202:14, 205:9
flush 206:15
flushed 277:24
focus 10:5, 10:9, 10:15, 55:7, 57:25, 59:13, 114:25, 128:10, 132:20, 134:8, 284:7
focused 110:1, 110:25, 131:14, 171:21
focusing 260:3
foley 282:1
folks 218:1, 276:17
follow 14:4, 57:14, 58:21, 58:24
follow-up 170:7, 196:23, 224:7, 271:12
followed 36:1, 233:21
following 10:6, 12:25, 23:7, 24:8, 56:21, 56:25, 140:12, 171:1, 210:5
Food 26:13, 27:3, 108:4, 108:6, 214:15
foot 21:14, 239:6, 241:15
footprint 231:11
foraged 283:21
foregoing 290:4
foreign 124:7
foremost 53:6, 101:23, 178:9
foreseeable 151:6
foresight 286:16
forest 76:10, 77:3, 98:9, 98:12
Forestry 23:22
Form 78:25, 79:3, 81:7, 110:19, 111:18, 112:15, 112:18, 112:19, 113:13, 114:7, 135:11, 163:16, 183:10, 254:16
formal 262:23
Formation 55:17, 142:9, 144:14, 231:17
formed 74:23, 204:1
former 53:5, 128:4
forms 112:11, 212:9
formulating 98:25
forth 16:13, 50:19, 98:24, 113:18, 185:17, 187:2, 216:23, 260:10, 277:4
Fortunately 286:12
Fortune 255:22
forward 24:2, 28:4, 30:3, 37:8, 42:15, 46:23, 51:12, 71:18, 73:11, 73:22, 122:5, 122:24, 157:25, 159:6, 192:25, 223:4, 228:2, 229:17, 233:9, 251:22, 251:23, 278:24
forwards 211:23
found 18:25, 108:1, 112:8, 156:21, 162:2, 164:15, 197:25, 238:1, 256:21, 272:16
founded 27:2, 28:13
founder 24:18
four 31:1, 60:20, 66:3, 82:5, 96:3, 108:9, 113:11, 118:13, 121:3, 167:19, 167:20, 172:22, 204:7, 210:25, 217:24
Fourth 82:14, 108:14, 210:12, 238:16
fracture 144:22, 155:19,

179:25, 198:4
fractured 111:2, 115:3, 116:13, 116:21, 118:6, 143:22, 156:12, 157:21, 162:12, 176:4, 187:7, 229:19, 229:25
fractures 156:13, 156:16, 157:20, 158:15, 162:2, 176:5, 177:11
frames 67:8
framework 53:25
Fredericia 127:21
free 211:17, 271:20, 271:21
free-flowing 120:15, 196:6
freed 88:25
freelance 95:23, 97:25
freezing 262:6
frequency 192:25, 246:2, 248:13, 248:24
freshwater 10:11
Friends 18:12
frightening 286:15
Front 3:37, 59:6, 60:10, 66:6, 84:11, 138:20, 190:16, 229:22, 241:22, 242:22, 243:9, 254:6, 271:6
fry 62:7
fulfill 20:15, 286:19
fulfilling 282:23
fulfillment 165:5
full 9:24, 21:23, 22:2, 73:2, 84:2, 85:11, 126:21, 188:23, 191:7, 193:21, 217:12, 220:2, 222:11, 222:15, 222:17, 222:19, 223:18, 223:22, 224:3, 224:12, 224:22, 224:23, 225:4, 233:1, 235:11, 235:15, 247:21, 250:5, 250:10, 260:20
full-scale 100:20
fully 18:4, 37:21, 39:12, 48:13, 48:14, 61:22, 62:3, 63:18, 70:8, 70:25, 72:13, 72:16, 116:18, 145:10, 145:16, 222:9, 230:2, 230:20, 233:3
function 46:9, 162:19, 165:6
functioning 48:13, 48:14, 51:10
fund 34:20, 46:2, 51:11, 100:18
fundamental 282:13, 282:22
funded 48:17, 49:24, 50:1, 50:5, 50:9, 66:9, 67:3, 67:5, 67:12, 72:13, 89:5, 89:8
funding 35:17, 36:5, 36:6, 41:21, 45:21, 46:2, 65:24, 66:4, 66:5, 66:10, 66:12, 66:13, 66:19, 70:10, 70:25, 81:21, 82:10, 83:17, 84:3, 100:19
funds 37:16, 46:18, 64:16, 81:20, 81:22, 81:23, 82:8, 82:12, 83:19, 100:4, 202:8
furthering 29:9
fused 32:11
fuss 32:8
future 27:22, 48:12, 48:16, 77:23, 151:6, 157:8, 163:11, 164:6, 192:9, 201:2, 221:16, 259:14, 261:12, 261:18, 286:6

< G >
gain 269:18
gallon 171:18, 217:25, 243:14
gamble 286:14
game 222:10
gap 65:2, 65:9
gargantuan 59:2
gate 9:21, 22:16
gather 9:8
gathered 111:13
gathering 244:17
gauge 196:5
gave 81:16
Gazette 13:2
GEI 270:7
Geir 101:22, 285:19
General 2:10, 11:15, 15:5, 16:2, 16:4, 103:25, 112:19, 125:7, 139:17, 145:24, 168:6, 171:13, 185:25, 204:8, 211:16, 214:10, 237:18, 239:5, 239:8, 288:7
generalizing 113:1
Generally 14:9, 42:16, 63:5, 89:15, 91:6, 142:7, 147:8, 149:9, 162:9, 179:14, 203:10, 205:17, 210:15, 222:3, 249:19
generate 22:9, 211:10, 211:12, 213:3
generated 89:18
generating 22:11
generation 22:6, 22:8
generators 23:13, 33:5
generic 240:6
genetics 102:5
gentleman 107:2
geologic 203:11
Geological 212:24
geologist 114:17
Geology 114:20, 114:21, 115:9, 144:11, 144:12, 156:23, 162:20, 255:17
GERALD 2:9
gets 72:8, 95:8, 191:21, 191:22, 277:13
getting 62:11, 65:7, 70:15, 126:15, 171:2, 176:25, 191:25, 196:9, 210:20, 243:21, 257:1, 263:10, 272:5, 272:10, 278:13, 278:22
Gillette 75:20
girl 32:4
give 15:20, 18:7, 21:17, 24:23, 30:7, 60:2, 62:13, 64:13, 69:22, 91:25, 107:9, 130:8, 162:23, 163:14, 180:4, 231:9, 231:24, 231:25, 249:10
Given 14:15, 17:23, 26:20, 49:1, 49:12, 63:15, 80:23, 88:21, 96:12, 96:13, 96:14, 185:22, 194:19, 203:13, 205:6, 205:14, 213:1, 237:7, 247:9, 277:7, 285:10
gives 62:6, 158:22, 193:12, 193:19, 200:23, 200:24, 237:7
giving 229:11
glacial 142:10, 144:15
glad 44:2
glib 281:17, 281:24
global 25:25, 26:25, 34:14, 58:15, 100:5
goal 16:9, 198:22
goals 73:16, 120:18
Gold 279:14, 279:16, 280:6, 281:8
goods 90:18

Goose 116:18, 119:12, 119:13, 167:9, 167:20, 194:20, 194:21, 194:23, 195:7
gotten 249:16
gov/dep/projects 15:16
Governing 12:23
government 29:7, 29:8
GPM 117:7, 117:14, 194:17, 219:15
GPN 219:16
Grace 4:6, 13:12, 17:3
gradual 210:2
graduate 110:13
grant 230:8, 230:12
granted 76:25, 225:11
granting 246:3
grants 29:6, 66:11
granular 184:1
grasp 236:10
grasshopper 32:5
gravel 76:5, 115:4
gray 172:15
Great 24:14, 27:18, 34:4, 59:18, 69:11, 79:5, 80:4, 87:1, 87:15, 95:2, 97:3, 159:3, 184:18, 218:23, 235:18, 240:8, 241:25, 250:18, 254:8, 255:1, 273:10, 275:8, 278:3
greater 76:5, 85:7, 85:8, 85:9, 103:13, 178:10, 213:20, 280:4, 281:11
greatest 146:2
greatly 168:18, 199:22, 200:1, 279:9
greenfield 75:9
grew 161:13
grill 68:9
gross 282:19
ground 70:15, 152:5, 180:19, 180:20, 203:25, 211:6, 232:16, 239:9, 253:2
grounded 227:18
group 12:5, 13:21, 66:3, 80:17
grouped 14:5
grouping 111:11
groups 110:12, 172:19
grow 22:1, 159:18, 249:10
grow-out 9:20, 21:20, 62:2, 62:5, 62:8, 200:19
growing 21:22, 26:21, 65:1, 214:13, 225:6
grown 65:10, 159:16
growth 26:22, 65:1, 76:10, 77:3, 151:19
guarantee 163:12, 163:16
guarantees 163:24
guessing 215:8
guests 20:4
guide 46:12
guidelines 253:21
guilty 94:21
Gulf 3:43, 13:13
guy 257:24
GWW-103 160:18, 177:11

< H >
habitat 74:25, 98:9, 98:10, 102:23
half 60:25, 70:11, 106:24, 168:11, 204:6, 216:1
halfway 45:10
Hallowell 2:13, 11:19
halved 204:5
Hampshire 109:22
hand 15:18, 34:24, 35:4, 84:9, 107:11, 246:11, 246:15
hand-in-hand 66:23
handful 162:19
handle 127:12, 203:21, 216:15, 217:11, 281:18, 284:24
handled 140:15
handling 133:16, 133:18
Handouts 11:4

hanging 275:6
Hanstholm 53:8, 126:4, 127:2, 127:23
happen 69:8, 102:13, 102:19, 120:1, 125:16, 152:21, 158:8, 164:6, 167:16, 167:17, 190:8, 221:13, 221:19, 250:23, 261:19, 269:11
happened 25:13
happening 180:11, 232:16, 277:6
happens 54:2, 54:23, 55:3, 111:10, 182:16, 201:17, 204:15, 247:21, 252:7, 254:11, 261:9
happy 34:7, 101:10, 134:11, 177:22, 184:21, 186:13, 209:23, 240:15
Harbors 23:25
Harbour 4:9
hard 96:11, 173:19, 197:12
Hardly 101:20, 102:6
harm 99:4, 270:23, 270:24
harmful 85:12
Harpswell 162:15
Harriet 18:12
Hartley 18:12
harvest 25:14, 62:23
harvesting 109:2
hatched 283:13
hatchery 21:24, 45:12, 109:3
hate 222:17
head 86:14, 182:5, 182:6
health 127:9, 128:1
hear 10:17, 15:4, 24:16, 33:10, 33:25, 62:17, 77:14, 88:15, 104:5, 107:25, 109:9, 109:17, 114:9, 123:17, 127:1, 187:17, 241:2, 276:21
heard 77:14, 90:4, 127:19, 151:9, 188:9, 217:23, 228:18, 256:24, 257:4, 257:16, 257:21, 259:2, 259:8, 261:18, 261:21, 262:11, 267:15, 268:25
heart 94:11
heavily 282:14
held 12:20, 85:22, 109:3
Helland 101:4, 101:12, 101:15
help 46:12, 71:10, 81:17, 163:3, 223:16, 258:7, 286:16
helped 85:2
helpful 180:23, 200:15, 217:22, 241:10, 247:7, 284:8
Herald 13:1
hereby 290:4
hereto 281:13
heritage 27:8
HGI 115:25
hierarchy 206:1, 206:5, 206:11, 220:19
high 32:5, 33:13, 33:21, 78:2, 115:8, 185:20, 186:16, 202:14, 206:25, 207:6, 221:17
Higher 33:17, 152:9, 159:24, 160:1, 160:5, 189:7, 189:21, 190:7, 201:3, 202:1, 205:8, 225:22, 226:15
highly 98:4, 100:8, 131:24, 144:20, 162:12, 191:1, 254:5, 259:12, 261:16, 282:23, 285:12

hike 105:21
hikes 105:9
Hills 5:9
hinge 191:23
hire 254:3
hired 255:14, 255:25
hiring 253:22
historians 287:18
historic 74:24, 203:10, 213:4, 276:9
historical 287:16
historically 116:16
history 35:7, 66:1, 82:3, 110:15, 283:2
hit 173:19, 193:21, 196:22
hits 233:18
hitting 198:25
Hmm 40:9, 45:25, 165:11, 194:2, 207:14, 208:5, 217:10, 265:7, 267:25, 274:12
hold 14:9, 39:22, 98:20, 109:14, 109:20, 114:20, 124:22
holding 48:15, 103:2, 211:21
holds 211:20
homes 253:3, 253:5
honored 20:4
hook 87:13
hope 91:3, 228:12
hopefully 235:15, 246:21
hoping 31:13, 72:23, 218:7
host 32:14, 218:2
hour 106:24
hours 15:14, 214:12
house 9:21, 22:16
Housekeeping 288:18
html 15:16
huge 102:17, 179:8, 183:21, 259:5
human 286:21
hundred 29:20
hundreds 84:23, 191:2
Hunt 4:34
Hutchinson 1:26
hydraulic 111:6, 146:21, 173:11, 177:12, 186:18, 187:6, 211:23, 231:12, 231:19, 237:16
hydraulically 119:16
hydraulics 102:6, 147:9
hydrogeologic 111:19, 114:2, 114:18, 114:24, 115:2, 115:15, 115:24, 116:11, 118:7, 158:22, 172:21, 196:3, 213:8, 223:20, 223:23, 243:7
hydrogeological 176:17
hydrogeologist 109:20, 167:13, 249:18
hydrogeology 110:2, 255:17
hydrologic 119:10, 205:15
hydrological 155:12
hydrologically 119:16
hydrologist 109:20
Hydrology 109:22, 110:2, 110:13, 145:19
hypothetical 165:21, 166:16

< I >
I. 79:11
ice 196:6
icon 85:19
idea 21:17, 90:22, 127:19, 128:3, 177:17, 182:8, 188:21, 188:22, 190:13, 192:8, 195:9, 208:8, 233:6, 276:13
ideal 224:11
ideally 222:1
ideas 243:21

identical 21:19
identified 18:4, 21:15, 41:18, 43:14, 50:24, 70:13, 90:15, 116:12, 121:8, 148:1, 164:12, 208:7, 257:6
identify 69:9, 72:11, 83:11, 115:11, 147:19, 229:7
identifying 38:11, 38:23
ignorant 281:17
ignoring 164:7
image 172:23
imagine 152:8, 206:5
immediate 89:1, 214:5
immediately 194:11, 214:11
impact 27:3, 175:9, 179:12, 179:19, 179:20, 189:24, 201:10, 209:9, 210:1, 221:9, 223:3, 223:8, 223:10, 223:17, 226:9, 226:25, 227:5, 227:8, 239:15, 240:23, 241:13, 241:19, 253:6, 258:8, 258:18, 262:9, 269:13, 277:13
impacted 156:20, 163:11, 224:21, 230:15, 240:24
impacting 137:18
impacts 10:10, 10:13, 10:21, 27:1, 32:23, 108:25, 118:24, 120:11, 121:1, 121:5, 121:7, 121:12, 122:15, 164:9, 198:8, 212:9, 236:16, 237:11, 241:16, 253:4
impair 149:24
impaired 245:6
impeded 108:19
impermeable 181:21
impervious 140:8, 140:14, 140:19, 140:22, 179:12
impinge 167:14
implementation 121:6
implementing 115:15, 245:25
implies 89:6
important 35:2, 35:7, 35:16, 75:11, 108:2, 119:11, 159:22, 170:4, 191:4, 192:23, 197:24, 198:9, 202:22, 208:18
importantly 261:24
importing 124:8
imports 65:16, 124:7
impossible 158:10, 258:4
impoundment 169:10
impractical 158:17
improved 33:20
Improvement 9:12
improvements 30:21
in-flow 117:13
in-flows 117:10
in-hand 46:5
in-stream 117:3
in. 64:12, 182:18, 188:1, 209:20, 255:8
inability 229:6, 283:16
inaccuracies 51:23
inaccurate 53:9, 53:11
Inappropriate 273:17
Inc 41:7, 47:13
Inc. 1:10, 3:4, 9:5, 34:9, 34:20, 35:17, 42:4, 42:9, 47:11, 47:24, 48:11, 48:16, 50:1, 50:5, 75:13, 82:11, 83:25, 84:1
incapable 56:19, 75:23, 282:23
inches 213:12
incidents 29:14, 53:24,

55:8, 55:9, 127:24
inclined 126:13
include 9:22, 16:6, 22:25, 23:1, 23:2, 23:12, 23:19, 52:17, 78:19, 108:10, 121:15, 125:3, 125:13, 125:20, 137:24, 154:25, 217:2
included 18:6, 23:18, 42:1, 43:20, 44:1, 110:7, 111:6, 115:23, 118:7, 118:10, 144:25, 150:19, 166:17, 213:7, 238:12
includes 21:6, 21:10, 22:6, 72:7, 120:12, 120:13, 164:22, 198:6
including 10:11, 10:18, 12:13, 23:17, 40:24, 82:5, 98:9, 111:2, 113:24, 125:24, 127:12, 155:3, 186:9, 229:14
inclusive 113:17, 113:21
incoming 22:15, 153:22, 154:5
incomplete 75:7, 76:18
incorrect 126:10
increase 152:16, 152:19, 167:22, 189:19, 191:12, 191:16, 205:9, 209:15, 215:16, 217:18, 226:19, 252:9, 267:6, 279:8
increased 31:8, 108:23, 121:4, 209:22, 213:16, 243:23, 243:25, 250:14, 267:3, 280:3, 281:10
increases 215:24, 226:7
increasing 152:17, 188:16
incremental 60:6
increments 69:6
incur 129:20
indefinite 243:19
independent 119:8, 119:14, 119:16, 119:20, 172:22
independently 227:22, 253:12
INDEX 6:1, 7:1, 8:1
indicate 64:19, 150:6, 150:12, 177:19, 199:14
indicated 167:10, 194:18, 235:24, 236:15, 289:6
indicates 103:5, 192:24, 250:10, 266:25
Indicating 37:17, 80:6, 80:9, 81:21, 83:3, 121:4, 185:9
indication 36:4, 36:12, 39:2, 150:16, 158:23, 176:9, 177:14, 229:12, 237:7
indications 197:9
indicative 158:4
indifference 280:19
individual 16:7, 118:14, 124:22, 125:8, 129:3, 163:20, 265:1, 281:22
indoors 25:8
induce 183:20
industrial 53:8, 98:3, 100:2, 102:17, 105:23, 124:6, 124:21, 127:22, 128:16, 129:16, 252:16, 252:17, 282:11,

283:8, 283:10
industry 23:17, 25:13, 25:17, 25:19, 26:21, 27:8, 27:22, 27:24, 27:25, 28:3, 28:8, 30:20, 31:10, 55:11, 63:3, 63:5, 92:6, 107:24, 112:1, 163:21, 271:17, 283:19, 288:6
inevitable 247:24
inexhaustible 280:22
infer 177:7
infiltrates 203:25
infiltrating 142:13
inflow 176:1
inflows 149:1, 149:14
influence 178:14, 183:19
influenced 108:24
inform 40:23, 111:15
informally 263:16
information 16:18, 22:22, 36:8, 43:20, 58:7, 58:9, 58:18, 68:21, 85:3, 91:9, 91:11, 102:25, 111:13, 155:3, 192:8, 218:11, 227:16, 245:22, 247:14, 254:13, 263:10, 270:10, 274:19, 274:21, 275:2, 275:19, 276:13, 282:15, 282:17, 283:6
informed 16:21
informs 114:3
infrastructure 20:13, 23:16, 61:25, 63:15, 102:18, 108:18, 168:9, 168:13, 202:9, 202:19, 214:6, 226:17, 252:22
ingredients 124:9
inherent 155:18
initial 60:7, 60:24, 61:17, 84:15, 173:1, 202:6, 281:16
initially 39:7, 70:15, 70:24, 204:1
injury 133:16
inland 176:7
input 99:1, 122:6
inputs 279:18
inquired 263:9
inquiry 264:21
inside 70:20, 70:23
insight 145:11
insightful 211:7, 232:21
insists 77:25
inspection 15:9, 260:12, 261:1, 274:20, 276:5
inspections 150:6
install 77:3, 140:3, 196:12
installed 116:21, 118:5, 195:20, 197:8
instance 89:3, 173:9, 196:4
instantaneous 117:12
Instead 33:13, 33:16, 53:18, 205:22, 254:23
Institute 3:43, 13:14, 255:19
institution 46:3, 47:8, 83:3
institutional 20:12
institutions 26:14, 27:17, 29:9, 36:13
instructed 115:8
instructions 42:12
insufficient 163:2
insult 14:25
Insurance 58:10, 58:15, 100:7, 101:21, 101:25, 102:8, 102:9, 102:10, 102:13, 102:15, 103:9, 104:15, 104:23, 285:18
insurances 58:14, 58:16
insure 104:16

insurer 101:24
insurmountable 246:9
intake 9:23, 77:3, 205:20, 205:23, 207:20, 245:1, 245:5
integral 262:18
integrity 261:17, 262:13, 274:22
intend 102:9
intended 84:10, 169:18
intends 267:23
intent 21:17, 46:2, 82:12, 220:15
intention 83:3, 192:20
intentionally 238:16, 238:17
inter-company 42:8
interaction 51:9
interchanges 278:20
interconnected 157:20
interest 19:2, 40:25, 41:1, 41:2, 41:9, 41:19, 172:8, 259:18
interested 13:6, 38:12, 41:20
interesting 26:12, 274:5
interests 38:1, 38:2
interface 158:14, 175:22, 229:8, 229:23
interflow 187:1
interject 219:5
internal 183:2, 183:18
international 37:5
internationally 26:3
internet 94:18
interpret 113:3
interpretation 236:22
interrogate 209:12
interrupt 184:9
interruptions 12:14
intertidal 187:12, 244:19
intervener 19:1
interveners 74:17
intervenor 12:5, 13:21, 19:6, 271:14
Intervenors 3:24, 4:2, 5:2, 13:10, 18:21
intervention 18:15, 18:18
interview 285:6
interviewed 285:2
interviews 276:16
introduce 24:2, 39:9, 41:15, 80:11
introduced 116:4
introducing 37:20
introduction 24:23, 151:14, 152:8
intuitive 232:21
invention 18:17
invest 29:25
invested 28:6, 38:18
investigating 98:2
investigation 109:7, 111:14, 111:19, 114:2, 115:24, 116:11, 118:7, 118:19, 120:4, 121:21, 122:1, 155:12, 158:22, 172:21, 176:17, 197:3, 197:9, 197:25, 223:20, 223:23, 224:1, 237:16, 243:7
investigations 101:7, 114:19, 114:24, 115:16
Investment 36:25, 37:3, 37:13, 38:5, 38:17, 46:11, 47:25, 48:1, 60:6, 60:12, 63:1, 71:9, 73:6, 101:20, 102:6
investments 57:13
investor 37:2
investors 37:25, 38:3, 38:10, 38:11, 38:22, 38:23, 99:10, 104:11
invite 55:17, 134:13

involved 45:10, 84:24, 110:18, 256:3, 256:14, 256:15
involvement 41:2, 256:1
involves 17:1, 18:10
inward 289:9
irony 253:11
irrevocably 43:15, 50:25
Island 20:9, 32:3
isolate 238:20
issuance 77:11
issue 73:19, 77:16, 121:15, 156:6, 165:20, 174:16, 175:12, 201:25, 227:9, 252:14, 257:3, 258:3, 258:13, 258:23, 281:24, 282:22
issued 98:23, 249:23, 270:16, 287:11
issues 10:6, 91:11, 126:8, 126:9, 164:4, 166:19, 166:23, 167:5, 167:23, 191:24, 210:7, 210:22, 212:3, 255:15, 256:21, 260:5, 268:23, 282:12, 282:13, 283:4, 284:10
Item 112:23, 122:8, 136:19
items 180:6
iterative 33:20
itself 142:4, 243:20

< J >
J. 1:23, 290:2
Jackson 167:11
James 2:4, 11:12
Jaoquin 279:24
Jeffrey 4:6, 13:12
Jerry 11:13
Jillian 264:9, 264:11
Joanna 3:6, 30:7
John 2:14, 107:3, 113:20, 116:7, 143:9
joined 107:2
joining 73:7
Jonesport 64:2
Journal 13:1, 96:5, 280:11
journalist 95:23, 98:1
journals 100:5
Jr 3:45
jtourangeau@dwmlaw.com 3:12
judge 278:14
judged 10:3
Judith 4:6, 13:12
Jump 181:10, 185:19, 255:8
juncture 70:8
justifiable 249:3
justified 283:7

< K >
k.ervitucker@gmail.com 4:12
Kallin 3:15
keen 209:20
keep 16:12, 54:11, 56:2, 56:9, 85:20, 159:5, 170:13, 176:11, 188:13, 272:13, 278:20
keeper 19:18
keeping 64:25, 65:5, 278:6
kept 21:8, 260:14
Kevin 2:11, 11:20
Key 21:2, 27:21, 28:4, 28:10, 41:16, 108:15, 111:22, 165:9, 211:21, 226:22, 250:13
kick 245:7
kick-off 20:5
kicking-off 48:4
killed 281:2
Kim 4:8
kind 36:16, 48:9, 62:10, 64:17, 65:22, 69:24, 72:2, 90:18, 90:25, 111:22, 167:12, 171:3, 171:5, 175:8, 176:22, 177:23,

189:15, 234:7, 234:12, 239:2, 244:17, 270:21, 277:4, 283:17
kinds 55:6, 62:25
Kingfish 29:3, 64:1, 159:21, 159:23, 160:7
knee 32:5
knell 281:21
knowing 190:6, 218:9
knowledge 30:24, 265:24
known 89:20, 142:8, 160:16, 246:5
knows 49:18
kracine@curtistharxter.com 3:32
Kristin 3:28, 40:1, 74:15
krone 71:25

< L >
L. 18:12
lack 244:20, 274:22
laid 70:23, 230:24, 234:17
Land 2:12, 2:13, 2:15, 11:18, 11:19, 21:9, 23:22, 32:13, 33:18, 33:22, 69:21, 100:21, 101:14, 101:17, 181:14, 256:5, 259:17, 259:18, 259:24, 272:6
LAND-BASED 1:12, 9:6, 25:9, 25:11, 28:1, 28:2, 30:14, 75:16, 100:9, 100:13, 100:15, 100:20, 101:1, 101:18, 101:25, 103:10, 103:25, 115:14, 285:20, 285:23
Lands 23:23
landscape 54:10
landside 229:1
language 52:10, 250:9
Lannan 3:35
large 20:12, 25:5, 27:12, 29:1, 38:21, 40:14, 85:22, 96:12, 104:8, 110:9, 114:2, 205:6, 205:17, 229:6, 230:5
largely 146:4
larger 26:7, 101:14, 231:5, 280:15
largest 28:14, 29:2, 38:5, 38:7, 52:18, 52:20, 75:15, 85:10, 92:3, 159:11, 159:14
last 14:24, 30:4, 36:12, 49:17, 50:6, 66:3, 95:24, 98:21, 167:3, 177:21, 193:14, 209:8, 231:3, 245:12, 252:17, 254:8, 264:4, 277:4, 280:8
last-year-and-a-half 210:9
Lastly 10:17, 18:20, 91:21, 91:22, 92:2
lasts 61:19
late 18:19, 162:15, 203:6, 203:8
later 68:10, 77:18, 101:10, 107:25, 209:12, 209:19, 214:20, 235:21, 236:8
laugh 209:9
Laughter. 94:25, 123:8, 169:15, 203:5, 278:15, 289:19
launch 39:17
launching 70:10
laundry 273:4
Law 10:9, 68:3, 76:25, 171:5, 266:20
lawfirm 40:2, 74:16
Laws 9:12, 9:13, 10:4, 58:21, 163:17, 163:19, 240:19
lax 78:9
lay 70:12
layer 144:16, 144:18, 144:21, 145:1, 145:7,

182:4, 182:6
layering 144:12
lays 164:2, 166:8
lead 110:11, 221:20, 265:15, 279:20, 280:3, 281:11
leader 85:25
leadership 286:16
leading 26:14, 107:23
leads 269:5, 280:4, 281:11
leakage 136:14, 137:4, 141:16, 145:13, 182:1, 183:20, 243:24, 243:25
leaks 183:9, 183:16
learned 30:23, 272:1
learning 30:20, 63:4
Lease 23:23
least 90:15, 91:14, 98:10, 141:25, 160:15, 189:23, 193:12, 195:22, 212:10, 217:24, 220:17, 228:17, 237:24, 250:5, 260:15, 268:24, 288:24
leave 59:2, 221:22, 245:5
leaving 181:10, 244:5
leery 101:21
leeway 18:7, 96:14, 130:9, 188:15
left 77:18, 102:16, 103:2, 195:17
leg 62:6
legal 41:14, 41:22, 47:21
legislation 57:12
legitimate 134:10, 260:1, 283:16
lenders 37:15, 38:12
length 14:15, 105:24, 233:24, 234:13, 235:4
leniency 77:12
less 14:15, 60:25, 98:8, 99:25, 160:4, 177:4, 181:15, 189:12, 189:13, 189:14, 191:6, 194:11, 199:13, 200:7, 204:11, 214:15, 214:16, 216:9, 222:13, 224:18, 225:14, 226:17, 278:5
letter 37:14, 37:18, 40:18, 40:22, 41:1, 41:6, 41:19, 42:3, 46:2, 81:19, 81:20, 81:24, 83:1, 83:2, 83:6, 143:11, 144:2
letters 36:13, 36:24, 39:2, 46:18
letting 87:12, 166:23, 284:2
level 63:23, 110:13, 115:9, 152:15, 155:5, 158:16, 170:14, 171:12, 182:9, 185:18, 187:20, 193:11, 201:4, 207:23, 208:11, 209:15, 212:4, 222:2, 233:14, 233:18, 237:4, 237:5, 244:24, 245:6, 245:21, 245:23, 260:14, 267:7, 269:9, 272:25
levels 63:18, 112:14, 121:4, 187:25, 188:16, 189:21, 195:13, 200:20, 200:21, 202:2, 208:18, 217:16, 217:17, 217:20, 226:16, 245:4
leveraged

118:12
leveraging 29:11, 29:16
liability 47:2, 275:6
License 10:16, 10:18, 16:19, 23:10, 23:11, 23:24, 32:25, 77:11
licensed 80:16
licenses 253:24
Licensing 11:1, 12:23, 33:13
licensure 33:4, 254:6
lie 283:10
life 21:22, 32:8, 106:5, 168:15, 187:16, 206:20, 207:3, 257:23
light 125:25
likely 55:17, 177:9, 249:13, 254:14, 257:7
likewise 104:15
limit 222:12, 224:18, 225:11, 225:13, 231:13
limitations 113:3, 157:10, 157:11, 190:18, 191:19, 220:5, 222:14
limited 47:2, 93:15, 147:12, 155:13, 177:10, 179:6, 253:1, 289:9
limiting 142:11, 145:5
limits 191:20, 198:24, 199:7, 215:17, 252:9, 252:10, 280:21, 287:13, 287:15
Lincolnville 4:10
line 25:21, 48:19, 69:23, 73:1, 73:4, 73:5, 91:6, 94:24, 109:4, 168:22, 230:18, 268:21
linear 215:16, 215:23
lines 25:12, 39:11, 69:5, 145:20
lining 78:11
link 123:19, 123:21
linked 47:7
lipstick 281:25
liquid 22:9, 22:10, 88:23
list 13:7, 131:23, 132:3, 132:11, 132:23, 166:14, 192:19, 195:17
listed 81:12, 81:13, 81:14, 192:22, 213:6, 221:11, 222:2
listen 16:16
listening 94:20
literature 204:13
live 74:20, 99:2, 105:1
live-streamed 12:7
lived 95:24, 96:10, 98:20, 128:17, 282:7, 282:9
LIVESAY 2:15, 7:25, 11:18, 215:3, 215:4, 215:14, 215:25, 216:3, 216:12, 217:4, 217:11, 217:22, 218:22, 219:18, 219:23
LLC 47:16, 48:1, 48:5, 48:6, 48:12, 48:14, 48:15, 48:17, 48:20, 49:1, 49:24, 50:2, 50:7
load 284:25
loads 76:7, 77:2, 98:13
loans 85:5
Lobstering 4:5, 13:13, 17:3, 17:22
lobstermen 32:3
Local 28:18, 65:17, 111:1, 135:6, 137:8, 186:5, 256:5
locally 179:16
located 9:7, 9:14, 12:18, 14:12, 28:23, 118:22, 119:13, 119:15, 137:19, 162:18, 236:16, 238:13
Location 9:11,

10:8, 23:8, 32:19, 40:6, 63:15, 105:5, 154:16, 154:21, 154:22, 164:14, 226:18, 242:25
locations 28:20, 137:12, 140:5, 153:14, 155:14, 158:17, 166:9, 180:10, 232:13, 259:1
lock 65:3
logic 246:10
logistical 288:17
long 25:24, 27:6, 55:18, 61:18, 65:6, 89:2, 112:16, 150:13, 166:20, 205:1, 216:16, 232:15, 243:19, 247:10, 250:14, 250:16, 250:20, 256:2, 256:13
long-run 279:22
long-term 64:19, 89:7, 101:2, 111:10, 111:16, 152:3, 161:24, 174:14, 190:10, 208:24, 211:16, 239:1, 244:19
longer 161:11, 161:13, 213:20, 262:1
looked 50:2, 86:9, 88:10, 156:18, 190:17, 222:7, 239:20, 253:25, 256:21, 258:7
looks 190:17, 223:23, 228:2, 245:21, 246:6
Los 279:16
lose 213:24, 254:24
losing 102:1, 186:24, 225:5
loss 82:21, 89:12, 103:13, 143:21, 175:18
loss-making 102:2
losses 175:17
lost 105:3, 214:9
lot 72:14, 91:11, 94:16, 107:3, 139:13, 185:24, 188:14, 191:24, 208:21, 209:19, 210:20, 213:1, 222:6, 229:10, 241:7, 253:10, 254:13, 255:6, 256:25, 261:18, 274:3, 276:6
loud 242:1
love 98:20
loves 105:8, 105:21
low 27:3, 31:3, 92:7, 142:16, 156:22, 178:18, 193:11, 214:23, 240:20, 262:5
lowering 155:4
lowest 101:16, 117:22
lreichard@gmail.com 4:29
lucky 28:13
lumberjacks 32:3
lunch 123:3, 123:5
Luncheon 123:12

< M >
M. 3:15, 3:28
Mabee 4:6, 13:12, 17:2
Mabee-grace 17:22
machines 190:25
Madore 2:18, 12:8
magnitude 75:14, 253:5
magnitudes 112:12
main 12:19, 55:7, 212:13
maine.gov/dep/bep 123:18, 123:21
Mainers 32:2, 32:6
maintain 12:15, 23:14, 57:10, 58:13, 134:7, 163:9, 199:10, 199:11,

208:23, 214:22, 261:19, 262:12
maintained 150:14, 211:24, 259:13, 260:18, 260:25, 265:17
maintaining 56:19, 108:7, 150:17, 192:18
maintenance 22:13, 126:23, 150:7, 260:13, 262:20, 262:21, 265:22, 274:24, 279:6, 279:9
major 29:13, 29:14, 36:2, 36:3, 70:14, 100:24, 136:12, 137:2, 211:25, 255:24, 256:20
majority 29:2, 85:25, 110:17, 124:8
man 66:2
manage 72:2, 153:11, 225:7
manageable 173:21
managed 140:24
Management 15:2, 20:14, 88:24, 139:25, 140:16, 178:6, 260:13
Manager 11:20, 25:2, 100:16
managing 109:15, 109:19
maneuver 221:19, 221:23
manner 144:7
map 69:9, 121:14
Marginal 3:8, 3:17
Marine 5:8, 10:22, 27:18, 142:10, 182:2, 183:16
Mark 2:2, 11:11, 279:14
markers 164:8
market 21:23, 34:25, 35:3, 36:18, 37:15, 37:23, 38:7, 38:8, 46:8, 46:15, 46:21, 63:19, 63:23, 64:3, 64:5, 64:6, 64:23, 68:16, 71:6, 71:10, 90:17
marketable 110:14
markets 27:12, 64:18, 90:15
martial 109:18
Marty 78:17
Master 109:23, 114:21, 255:17
match 235:7
matching 234:9
material 35:13, 35:24, 75:23, 76:22, 78:21, 80:20, 152:16
materials 81:24, 83:22, 85:12, 88:3, 229:22, 243:3
math 167:25, 235:23
mathematical 203:10
MATTER 1:9, 17:1, 18:10, 19:6, 76:25, 134:14, 150:19, 221:14, 260:2, 262:7
matters 16:24, 29:17, 99:12, 109:13, 227:14, 252:1, 288:18
mature 98:8, 217:6
maturity 128:15
Maureen 139:24
maximize 222:8
maximum 106:5, 117:11, 172:11, 188:4, 188:23, 190:3, 191:7, 218:2, 222:2, 239:6, 249:14, 249:16
Maximus 53:7, 126:3, 127:1, 127:22, 128:4, 128:5
mayor 25:2
Mccloskey 85:19
Mcdonald 109:15
Mcglone 139:24, 140:2
meal 124:9, 283:14
mean 32:3, 64:11, 91:3, 117:20, 117:22, 128:22, 131:8, 152:4, 153:7, 172:21, 179:24,

182:23, 218:23, 228:11, 233:23, 236:4, 236:11, 241:16, 242:6, 245:17, 254:24
meaning 112:12, 112:16
meaningful 158:19
means 28:17, 107:18, 152:14, 201:1, 202:7, 205:19, 209:24, 236:12, 241:19, 248:9, 283:9, 290:6
meant 170:17, 175:8
meantime 74:7, 275:9
measurable 237:5, 237:23, 238:6, 238:12, 238:15
measure 268:15
measured 238:2
measurements 118:14
measures 55:7, 72:12, 267:20
mechanicals 22:7
mechanism 33:11
media 12:10
meet 33:12, 197:19, 199:6
meeting 18:15, 68:3, 97:6, 123:20, 123:22, 167:9, 167:22, 186:17, 283:6
meetings 58:8, 58:9, 58:18, 102:25
meets 11:1, 78:2, 253:21
MEMA 265:1, 274:21, 274:25, 275:18, 275:20, 275:23
Member 11:8, 16:4, 115:7, 275:11, 289:1
Members 2:1, 11:10, 14:7, 14:17, 16:15, 20:3, 20:4, 31:20, 34:7, 64:14, 80:12, 99:11, 109:10, 114:11, 188:4, 241:3, 282:4
memo 45:13, 139:7, 201:25
memorandum 111:18, 137:22, 138:10, 143:15, 143:19, 144:5, 144:25, 178:19, 242:13
memory 216:13, 216:19
mention 19:17, 38:19, 42:4, 157:17, 179:3, 211:15, 246:23
mentioned 35:1, 38:6, 38:16, 42:22, 43:6, 45:21, 50:7, 61:16, 71:6, 72:6, 116:5, 119:23, 120:4, 161:15, 168:10, 180:7, 193:8, 194:21, 199:9, 199:13, 203:22, 207:5, 211:17, 214:8, 226:14, 240:21, 247:1, 257:11, 259:16, 288:1
MEPDES 33:1, 33:12
mess 104:22, 286:1
message 289:13
messes 261:6
met 33:15, 67:11, 67:13, 77:10, 84:8, 234:19
method 108:6
methods 153:24
metric 9:19, 26:4, 26:17, 26:19, 32:9, 60:18, 60:25, 61:6, 62:22, 63:8, 63:20, 63:22, 63:24
Miami 281:23
mic 124:24, 259:22
microphone 62:16, 88:12, 94:19, 109:6, 159:8, 184:16
mid 219:11
mid-20s 189:1, 189:7

mid-coast 95:24, 98:19, 282:8
migrating 158:13
migration 176:7
Mike 115:16, 116:4, 116:5, 120:4, 156:9, 198:1, 223:20, 242:15
miles 96:15, 119:15, 167:19, 167:20, 281:4, 281:5
Million. 69:19
millions 99:10
mind 86:14, 90:9, 278:24, 281:13
Minimal 130:16, 130:19, 130:20
minimize 118:24
minimum 122:15, 130:17, 194:23
Minor 23:9, 33:3
minutes 28:12, 34:5, 72:20, 95:11, 95:14, 123:5, 123:10, 278:8
mirror 257:19
misinformation 124:18
mislead 228:12
mission 15:3
misspelled 114:15
misstatements 97:13
mistake 251:13
mistakes 30:22
mitigate 120:8, 265:18
mix 37:17, 37:21, 39:9, 61:15, 71:14, 76:5, 188:19, 189:5, 197:24, 198:10, 200:5, 206:7, 208:1, 208:20, 226:9, 272:9
mixed 109:18
mlannan@techenv.com 3:40
MMA 109:16, 110:15, 110:21, 111:17, 111:22, 118:16
Mmm 40:9, 45:25, 165:11, 194:2, 207:14, 208:5, 217:10, 265:7, 267:25, 274:12
mode 65:8
model-based 112:19
modeled 122:12, 136:13, 137:2, 137:8, 182:12
modeler 257:21
models 110:3, 110:8, 203:9, 203:10, 210:7, 229:16, 253:11, 257:23, 257:24, 258:5, 286:6
moderate 200:17
modular 62:2
module 70:21, 70:22
modules 9:21, 21:20, 62:6, 62:8
moi 94:21
molten 187:11
moment 37:12, 47:15, 48:7, 97:25, 98:15, 111:14, 128:12, 172:17, 176:7, 194:3, 194:4, 195:12, 252:4
moments 113:14, 116:25
money 45:22, 69:24, 70:3, 85:19, 85:20, 89:10, 89:12, 102:1, 168:18, 207:8, 269:19, 269:20, 286:1
monies 51:5
monitor 120:7, 156:25, 157:1, 157:25, 158:2, 171:25, 173:23, 258:11, 267:20, 267:23
monitored 164:9, 174:15, 208:21, 248:13, 269:11
monitors 165:12
month 49:17
monthly 117:22
months 21:21, 22:1, 73:10, 193:12, 210:25, 284:23

morning 9:2, 18:2, 19:13, 20:2, 24:17, 31:19, 34:6, 74:14, 80:11, 84:20, 84:21, 95:21, 95:22, 103:18, 103:19, 104:8, 104:18, 109:10, 114:10, 124:5, 124:19, 260:24
Morrissey 109:15
mostly 142:8, 162:19, 171:21, 180:16, 252:16
mouth 160:23, 161:4
Move 14:2, 14:14, 28:20, 30:6, 34:3, 37:8, 63:11, 72:16, 73:11, 73:22, 129:3, 133:4, 134:16, 229:23, 233:11, 252:8, 253:2, 253:10, 258:22
moved 28:3, 63:6, 288:21
movements 71:24, 72:3
moves 156:11, 156:12, 223:4
moving 25:14, 46:23, 51:12, 70:19, 71:18, 76:13
multiple 189:17, 234:4, 250:7, 278:17
municipal 74:19, 116:22
Myre 101:23, 102:1, 102:3, 285:19, 285:21
myself 78:20, 90:8, 135:25, 167:13, 255:13, 278:13
mystery 123:16

< N >
N-E-I-L-S-O-N 114:17
NAF 34:20, 34:22, 34:23, 37:4, 45:14, 48:16, 107:25, 109:5
name 11:8, 12:4, 20:8, 24:17, 34:8, 37:4, 39:25, 48:2, 80:14, 95:22, 109:14, 114:14, 114:15, 134:19, 255:11, 289:18
names 154:20
narrow 57:24
NAS 42:9
Natural 9:10, 10:7, 23:9, 32:22, 76:1, 76:4, 77:2, 105:6, 108:17, 113:1, 115:19, 120:24, 121:2, 122:19, 146:11, 225:21, 236:12, 240:19
nature 122:1, 178:15, 181:6, 186:2, 231:19, 248:18
near 74:23, 85:1, 187:11
nearly 20:14, 92:5
necessarily 91:13, 140:19, 146:10, 169:24, 179:11, 204:12, 205:5, 205:12, 230:2, 241:16, 271:2
necessary 15:2, 36:6, 195:4, 205:3, 226:4
necessity 226:4, 279:9
needed 67:12, 119:23, 125:4, 125:13, 126:1, 147:20, 167:24, 168:2, 169:8, 200:6, 202:20, 214:24, 215:24, 224:20, 225:3, 228:6, 245:22, 247:6, 271:13, 286:17
needs 12:10, 74:19, 89:3, 100:1, 100:4,

109:1, 122:22, 122:23, 170:2, 172:4, 206:18, 208:1, 213:20, 214:13, 250:21, 258:20, 281:19
negative 198:3, 225:8, 285:23
negatively 137:18
neglect 262:2, 265:15
negotiations 230:11
neighbor 280:15
neighborhood 163:1
neighboring 10:14, 161:12
neighbors 33:7, 164:10, 230:7, 241:1, 273:3
neither 97:17
Nestle 159:11, 159:14
net 27:25, 63:11
network 116:20, 118:9, 118:12, 118:21, 118:23, 120:12, 157:20, 158:14
New 5:4, 5:7, 13:14, 17:16, 18:2, 25:10, 28:20, 29:19, 32:6, 33:4, 33:17, 39:4, 39:5, 39:13, 80:2, 100:8, 109:2, 109:4, 109:22, 110:9, 190:11, 247:10, 248:9, 248:11, 252:7, 252:20, 252:24, 253:9, 269:18
News 13:1, 92:5, 280:10
newsletters 92:7
newspapers 12:25
next 26:15, 32:21, 34:1, 48:5, 60:22, 61:7, 61:8, 71:2, 72:14, 72:16, 107:6, 203:4, 204:21, 236:14, 252:4, 278:9
Nice 92:16, 193:19, 241:25
niche 64:1, 64:3
Nick 2:15, 11:18
night 167:21
nitrogen 98:6
no-flow 184:4
No. 51:16, 94:8, 131:1, 143:5, 172:12, 182:22, 226:12, 251:5, 268:9
noise 19:12
Non-existent 147:4, 147:5
non-fishery 214:8
non-pumping 176:2, 182:14, 233:8
None 24:6, 34:3, 46:17, 72:18, 87:2, 92:11, 191:19, 252:7, 275:10, 284:19, 288:11
nor 48:21, 82:21, 82:22, 284:16
normal 42:18, 188:24, 189:16, 190:2, 248:9, 248:11, 276:19
normally 205:22, 276:15
North 20:19, 20:20, 24:19, 164:14, 179:14, 180:1, 180:8, 180:9, 180:12, 238:8
north/south 231:15, 231:21
northeast 20:23, 114:19, 114:25
northern 21:11, 74:20, 173:10, 177:24, 198:2, 237:22, 238:14
Northport 3:26, 9:7, 13:11, 40:3, 74:17, 74:18, 74:19, 74:20, 280:12, 280:14, 282:3

northwest 164:14
Norway 27:25, 28:3, 28:13, 29:1, 30:13, 38:4, 45:19, 66:4, 82:6, 91:10, 92:4, 96:1, 97:15, 97:19, 101:19, 285:4
Norwegian 29:7, 34:23, 35:19, 35:21, 35:22, 45:15, 47:23, 71:25, 83:23, 100:14, 100:16
notable 231:12, 237:19, 237:20
notably 279:24
Notary 1:23, 290:3
Note 12:17, 14:7, 39:4, 99:5, 119:11, 141:9, 145:22, 168:6
noted 96:10, 122:21, 126:15, 164:9, 274:23
notes 145:23
Nothing 15:20, 32:6, 80:2, 132:4
Notice 12:24, 13:3, 61:24
noticed 114:14
notices 166:1
notification 13:6
notify 19:20, 274:15
noting 164:21, 190:7
NRPA 32:23, 33:12, 105:5
numbers 174:1, 188:3, 199:12, 219:13, 220:3, 225:18, 236:11
numerical 110:4, 110:8, 110:18, 111:1
Numerous 58:16, 88:7, 100:5
nutrients 23:18
NVC 76:19, 76:21
Nyland 285:3, 285:4, 285:7, 285:9, 288:2

< O >
o'clock 288:15
O2 22:10
object 48:18, 96:8
objecting 49:3, 259:22
objections 49:8
objectives 111:5, 112:6
objects 131:7
obligated 274:15
oblong 55:16
observed 136:11, 156:24
obtain 34:25, 40:5, 102:14, 102:20
obtained 228:21
obtaining 102:13
obvious 174:16, 174:17
Obviously 45:6, 46:7, 65:13, 73:6, 103:24, 168:17, 178:1, 179:19, 207:18
occasional 18:20, 19:8
occupied 259:5
occur 95:17, 120:25, 121:12, 146:3, 147:3, 156:15, 156:24, 176:15, 177:9, 178:6, 204:3, 230:1, 233:9, 233:14, 257:8, 258:17, 259:14, 261:20, 261:23
occurred 149:15, 151:1, 237:18, 257:20
occurrence 232:23
occurrences 158:6
occurring 111:7, 112:9, 113:24, 178:17, 194:10, 229:9, 234:6
occurs 111:10, 187:10, 203:24, 228:9, 229:21
Ocean 20:10, 26:25, 181:25, 182:16, 184:25, 187:24, 226:6, 226:7, 226:13
Oceans 26:24, 27:5, 75:12, 88:5, 88:8,

88:10, 88:18
oddly 104:5
odor 10:14, 32:21
off-site 141:23, 171:21, 197:5, 233:11, 233:25
offering 71:16
offers 86:4
Office 2:10, 2:11, 11:21, 15:14, 127:21, 263:25, 285:3
Officer 1:20, 11:10, 19:4, 20:3, 31:20, 49:6, 49:9, 96:21, 107:8, 109:10, 114:10, 134:6, 255:10
offices 25:23, 37:2
official 278:23
offsetting 279:10
often 86:4, 115:25, 228:24, 229:2
Oftentimes 276:11
old 76:9, 77:2, 163:17, 167:19
On-site 75:22, 118:4, 135:11, 145:19, 148:4, 160:12, 187:7, 194:5, 194:8, 196:25, 197:19, 198:16, 229:10, 266:19
Once 11:24, 19:11, 37:8, 39:16, 77:18, 84:9, 123:20, 131:6, 133:25, 136:22, 184:23, 190:4, 191:25, 214:21, 222:10, 224:12, 224:15, 234:22, 245:14, 278:17, 280:11
one-fifth 284:17, 284:20
one. 67:24, 78:11, 169:2, 251:3
ones 79:15
ongoing 23:21, 89:4, 121:9, 230:11
online 15:15, 61:24, 94:20, 123:15, 123:17, 167:11, 173:1, 216:6
open 65:6, 195:5, 218:15, 262:24
OPENING 6:3, 13:22, 14:1, 24:5, 24:9, 24:11, 24:13, 31:17, 74:8, 95:9, 95:17, 99:20, 119:23
operate 29:2, 57:23, 75:15, 108:23, 153:7, 188:10, 189:12, 199:3, 200:22, 219:21, 220:2, 220:6, 220:24, 222:18
operated 110:16, 284:16
operating 28:18, 28:22, 39:10, 73:21, 189:16, 190:2, 191:6, 200:1, 200:8, 200:25, 209:3, 215:5
operation 41:15, 41:16, 45:3, 50:8, 50:9, 60:22, 61:20, 61:23, 97:19, 108:17, 151:20, 152:2, 193:15, 193:22, 200:3, 202:21, 215:15, 216:6, 217:12, 222:25, 247:14, 262:19, 284:18
operational 33:11, 37:11, 48:7, 48:22, 60:8, 108:21, 110:17, 121:17, 121:25, 188:24, 200:23, 222:14, 225:1
operationally

213:19, 246:19
opinion 83:5, 83:8, 93:6, 112:3, 113:12, 257:16, 270:5
opinions 254:2
opportunities 41:10, 41:12, 56:1
opportunity 13:22, 20:6, 24:1, 27:7, 30:12, 52:4, 58:2, 78:14, 166:12, 180:25, 210:24, 245:13, 253:1, 254:3, 266:2, 284:6
oppose 75:11
opposed 82:11, 101:17, 159:17, 159:18, 163:21, 240:6, 272:4
opposite 182:16
optimal 188:18, 215:5, 216:1, 226:1
optimism 38:22
optimization 201:6
optimize 209:7
optimized 119:22
optimizing 209:6
optimum 208:4
option 33:11, 150:20, 221:5, 266:12, 289:1
options 224:12, 230:24, 231:2, 256:18
Order 9:3, 12:15, 17:9, 22:10, 23:13, 85:4, 90:1, 90:17, 120:8, 120:17, 130:10, 131:21, 133:22, 137:23, 168:2, 206:19, 208:2, 213:2, 220:23, 227:9, 244:15, 249:17
Orders 16:14, 17:7, 95:6
ordinance 69:4, 252:23
Organization 26:13
organized 138:14
original 242:3, 242:9, 256:15
originally 18:25, 70:14
orphans 261:13
Oslo 38:7, 92:4
others 77:22, 78:12, 85:19, 108:20, 110:20, 129:14, 135:21, 141:20
otherwise 17:11, 32:15, 39:17, 53:10, 221:17
ourselves 57:25, 59:6, 62:11, 211:19, 222:13, 222:18, 224:18, 284:4
outages 33:5
outbreak 52:24, 125:5, 125:14, 126:4, 127:2, 127:13
outbreaks 29:15, 53:7, 54:7
outcome 114:5
outfitted 237:17
output 108:3, 213:6, 222:16, 225:24, 231:25, 243:12
outright 248:5
outside 12:18, 59:5, 108:24, 113:9, 141:7, 182:21, 283:23
overall 10:24, 21:1, 30:16, 35:24, 66:21, 94:6, 100:14, 119:24, 126:11, 129:22, 193:18, 216:11, 239:6, 239:17, 280:7
overburden 118:10, 120:16, 185:3, 185:23
overdraft 279:20, 280:5, 281:12
overdrafted 280:8
overhaul 152:10
overlap 216:13
overruled 55:2
overseas 65:22, 67:1, 165:4
oversimplifying 139:16, 181:10,

185:19
oversubscribed 34:18, 104:3, 104:11
overview 13:24, 19:10, 24:12, 30:7
overwhelming 124:8
own 99:24, 102:16, 103:8, 105:22, 106:4, 121:25, 129:17, 132:11, 132:24, 166:1, 241:9, 266:8, 272:5, 285:1
owned 35:18, 50:21, 261:14
owner 121:16, 163:21, 274:15, 275:6
owners 29:2, 230:8
ownership 256:6, 256:9
owns 240:16, 263:4
oxygen 22:8, 22:9, 22:11, 23:4

< P >
p.m. 15:5, 289:21
pace 36:5, 278:7, 283:15
Pacific 281:5
package 66:21, 113:16
packets 225:8
packing 170:23
pad 22:8
Page 6:1, 6:2, 7:1, 7:2, 8:1, 8:2, 123:19, 123:22, 138:16, 232:7, 265:13
Pages 25:4, 266:21
pairs 195:23
PANEL 7:9, 14:3, 45:1, 52:4, 107:2, 107:12, 124:11, 124:15, 131:9, 132:20, 133:14, 134:12, 134:13, 150:15, 161:9, 218:25, 219:3, 251:17, 251:18, 252:5
panels 14:6
Paper 14:20, 201:25
papers 275:13, 288:20
Paragraph 81:16, 136:10, 136:18, 138:16, 144:3, 236:15
parameter 248:24
parameters 193:14, 218:18, 220:6, 220:7
parcel 231:6
pardon 95:13, 132:18, 273:25
parent 34:23, 35:19, 35:22, 38:4, 47:23, 50:20, 50:21, 82:11, 84:2
Pareto 45:13
Park 75:20
Parker 2:4, 7:21, 8:12, 11:12, 196:20, 196:21, 197:4, 197:12, 197:18, 198:11, 199:15, 199:23, 200:10, 201:16, 202:10, 202:13, 202:24, 202:25, 273:23, 273:24, 274:3, 274:5, 274:11, 274:13, 275:3, 275:11
parking 21:11
Parks 23:22
parsimonious 212:11
participants 15:23
participate 17:23, 30:2
participated 20:13
participating 230:7
participation 16:7, 16:23, 41:3, 230:10
particles 214:16
particular 46:19, 92:10, 110:3, 113:19, 172:7, 172:16, 173:20,

174:4, 174:14, 176:12, 179:9, 197:21, 203:21, 210:19, 213:25, 220:23, 229:9, 244:11, 247:15, 247:16, 260:11, 260:17
particularized 19:2
particularly 173:8, 175:10, 204:17, 233:11, 245:24, 274:23, 289:3
PARTIES 3:1, 4:1, 5:1, 13:3, 13:17, 13:20, 17:7, 17:20, 49:8, 74:13, 97:7, 168:6, 288:19, 288:23, 288:24, 289:10
partitioning 36:2
partner 109:15, 109:19
parts 68:21, 181:14, 182:10, 189:6, 214:1
party 16:4
pass 56:21, 109:6, 250:11
passage 175:25
passed 250:5
passing 93:18, 117:25, 182:4
past 25:24, 33:18, 63:6, 92:6, 197:1, 213:12, 213:14
patience 95:3, 123:13
patient 33:24
Paul 17:4
pay 89:9, 101:19, 158:23, 271:19, 272:3
paying 168:16, 254:19, 254:22
peak 33:6
peer 115:6
Peggy 2:10, 11:14
Pelletier 2:5, 6:8, 7:24, 11:12, 30:10, 30:11, 31:14, 97:14, 210:4, 210:5, 210:16, 212:16, 213:18, 214:25, 243:4
pen 27:25
pending 51:12
Penobscot 76:11, 77:4, 85:18, 108:11, 142:9
pens 63:11
people 25:23, 28:6, 29:20, 29:25, 62:17, 92:11, 94:19, 94:20, 97:16, 99:1, 161:25, 162:25, 163:4, 184:21, 184:22, 196:8, 208:13, 209:11, 217:24, 218:24, 230:14, 239:20, 244:24, 253:16, 264:21, 265:5, 271:12, 282:19
perceive 166:23
percent 26:19, 42:16, 42:25, 43:10, 44:4, 44:13, 44:15, 71:19, 82:2, 82:6, 100:1, 100:3, 107:17, 107:20, 117:15, 152:13, 159:19, 187:17, 198:14, 209:14, 246:8, 283:20, 285:11, 285:23
percentage 46:13, 188:22
perched 185:24, 186:5, 186:7, 186:9, 186:19, 195:11
perform 136:6, 153:6, 253:24, 286:5
performance 105:19, 121:3, 121:11, 121:13, 234:19, 246:18
performed 155:12, 161:16,

162:14
Perhaps 53:6, 126:25, 151:11, 159:15, 160:14, 161:10, 256:18, 271:9, 279:2
perimeter 140:3, 140:10, 140:18
period 61:19, 67:12, 70:5, 110:17, 173:5, 205:2, 205:14, 211:1, 217:1, 232:11, 232:15, 233:17, 234:22, 243:19, 248:7, 249:17, 250:14, 250:16
periods 172:20, 200:7, 205:1, 205:5, 210:23, 213:20
Peripheral 183:6
Perkins 3:45, 273:3
permission 123:7, 225:15, 264:12
permits 10:5, 14:23, 19:5, 23:7, 23:19, 34:20, 34:24, 35:4, 36:17, 37:8, 39:16, 45:7, 46:5, 46:23, 51:12, 65:25, 66:14, 84:9, 120:18, 230:12
permitted 16:3, 149:12, 149:13, 223:18, 244:5
permitting 20:11, 38:25, 43:23, 48:4, 51:7, 57:1, 66:24, 69:21, 82:10, 84:8, 218:9, 223:10, 234:6, 255:23, 258:21
person 57:16, 90:8, 92:19, 155:6, 166:16, 219:1, 235:23, 245:5
personally 88:4, 190:23
persons 11:13, 13:4, 13:6, 15:17, 98:24, 99:4, 99:7
perspective 60:2, 119:11, 170:4, 175:14, 176:13, 205:20, 234:2, 234:10
pertain 47:4, 204:2
pertaining 112:24
pertinent 92:18, 252:1, 252:14, 252:19
petitioning 44:8
Ph 5:6, 109:25, 147:22
phased 61:2, 69:5, 86:12, 91:1, 92:24, 93:1, 93:20, 234:5
phases 22:25, 35:25, 36:2, 60:5, 61:15, 81:15, 95:17, 247:3
phasing 36:10, 62:9, 72:11, 94:6, 94:7
phenomenon 151:23
Phone 3:11, 3:20, 3:39, 3:48, 4:11, 4:19, 4:28, 4:37, 4:44, 5:11
phones 12:13, 12:15, 19:12
phosphorous 98:6
photo 79:21
photograph 260:20
physically 229:25
picking 172:19
picture 153:18, 260:7
pictures 22:20
piece 30:6, 35:16, 44:6, 71:13, 112:15, 157:4, 207:13, 228:14
pieces 139:12, 171:10, 174:10
piezometers 195:16, 195:19
pig 282:1
pipe 9:23, 77:5, 205:23, 260:17
pipeline 151:25

pipes 9:23, 77:4, 167:19
piping 69:22
Pit 167:11
placards 289:16
place 45:7, 72:13, 90:6, 90:13, 129:3, 129:14, 158:6, 164:13, 164:17, 164:19, 195:4, 195:11, 195:17, 195:25, 196:3, 201:10, 235:5, 252:13, 267:12, 267:13, 286:21, 286:24, 287:14
placed 38:14, 274:24
places 180:13, 186:23, 230:2
planned 65:13, 84:4, 106:23, 123:5, 285:14, 285:16
Planning 15:17, 20:11, 20:13, 23:20, 69:24, 117:14, 123:2, 125:22, 148:20, 149:2, 149:6, 149:10, 150:22, 150:24, 151:5, 167:18, 167:21
plans 21:16, 82:24, 138:22
plant 9:24, 22:6, 22:14, 22:15, 23:3, 23:5, 62:1, 75:19, 101:3, 191:20
play 221:25, 245:2, 286:8, 287:16
players 26:10
Plaza 3:30
pleased 40:23
pleasure 287:6
plenty 31:14
plugging 233:8
plumes 281:4
plus 60:18, 63:24, 117:13, 149:1, 149:14, 193:13, 193:14, 193:21, 238:9, 250:7
point. 183:14, 201:5
Pointe 4:9
pointed 26:14, 102:3, 160:22, 247:8
pointing 88:17
points 118:9, 120:13, 171:15, 196:2, 234:18, 238:19
political 68:19
Pollutant 32:24
polluting 98:4, 98:5
Pollution 9:13, 23:10
Polytechnic 255:19
poor 76:14, 260:6, 275:1
poorer 25:3
poorly 259:13
populations 25:11
portion 13:8, 38:13, 58:4, 67:13, 76:3, 106:18, 118:22, 144:19, 144:21, 145:6, 164:20, 174:22, 193:18, 205:6, 205:17, 237:22, 238:14
portions 15:11, 20:22, 22:25, 36:4
Portland 3:10, 3:19, 3:31, 3:47, 263:24
Portland-based 40:1, 74:15
pose 156:19
posed 191:7
posing 169:16
position 65:2, 65:5, 65:6, 67:19, 76:17, 76:23, 105:18, 109:15, 171:25, 202:11, 239:18, 272:1
positioned 37:4, 38:4, 38:9, 194:10
positions 171:22
positive 227:9
possibilities 77:16, 211:13
possibility 145:4, 212:10, 225:25,

226:10, 230:17, 250:8
possible 41:3, 65:6, 157:12, 181:2, 188:10
Possibly 76:1, 79:21, 152:7, 281:22
post-constructi on 140:25
post-developmen t 227:17
post-permit 73:10
post-smolt 100:18, 100:25
postponing 109:3
potability 163:6, 165:18
potentially 68:18, 85:11, 102:17, 102:18, 167:17, 198:3, 200:13, 201:1, 245:6, 269:18, 270:23, 274:14
power 23:14, 33:5, 226:18, 250:24
powerful 212:2
Powerpoint 17:1, 17:5, 17:13, 17:15, 17:17, 17:25, 18:2, 96:9
PPT 152:18, 152:19, 159:21, 187:20, 188:13, 189:1, 189:7, 209:22, 209:25
practical 157:24
practicality 157:18
practice 234:12, 276:8
practiced 80:16
pre 80:8
pre-condition 193:7, 225:24
pre-development 120:20, 233:7, 244:23, 245:3
pre-filed 13:19, 15:7, 16:16, 17:8, 18:3, 18:23, 58:3, 61:14, 67:16, 69:14, 131:10, 136:11, 143:7, 232:8, 242:6, 259:25, 283:25
pre-hearing 17:6, 17:21, 289:7
pre-pumping 187:4
pre-taping 17:21
pre-treatment 202:15, 202:17, 202:19
precious 99:1, 286:20
precipitation 137:1, 142:13, 182:23, 183:8, 183:17, 184:7, 210:20, 213:13, 213:16, 231:5, 231:7, 243:22
preclude 202:15
predated 197:3
predicated 249:14, 259:9
predict 90:2, 91:6, 146:18, 147:3, 157:16, 171:19, 212:5, 231:10, 239:1, 257:25
predictability 73:17
predictable 229:24, 230:2, 286:8
predicted 26:16, 26:18, 44:14, 171:23, 189:24, 233:19, 238:23, 238:24, 239:4, 244:11, 244:12
predicting 90:10, 113:10, 157:10, 172:3, 228:10
prediction 145:13, 170:16, 170:24, 237:6, 258:15
predictions 91:12, 91:17, 147:11, 157:6, 162:5, 204:9, 234:9, 259:8
predictive 113:2, 118:19, 257:25, 258:8, 261:4, 269:13,

277:12
predominantly 258:1, 271:22
predominately 68:23
preemptive 55:6, 125:22
preemptively 55:12
preexisting 229:12
prefer 153:2, 153:4, 187:25, 188:13, 206:21
preferable 271:18
preferably 271:10
preference 153:8, 206:11, 206:23, 207:1, 207:9, 207:11, 207:16
preferential 231:18
preferentially 231:20
preferred 206:1
preliminary 274:9
premise 216:14
prep 70:16
prepare 74:8
prepared 73:9, 89:24, 124:16, 131:11, 242:15
PRESENT 2:1, 2:8, 20:6, 31:24, 95:4, 95:14, 144:15, 145:9, 170:1, 174:16, 187:4, 267:1, 289:4
presentation 13:23, 17:1, 17:5, 17:10, 17:13, 17:15, 17:17, 17:25, 18:2, 18:8, 19:14, 96:9, 255:5, 274:6
presented 18:5, 18:22, 91:15, 113:19, 143:8, 157:6
presenting 12:2, 21:1, 30:3
preserve 218:2
President 20:16, 24:18, 101:5, 101:12
Presiding 1:20, 11:10, 19:4, 20:2, 31:19, 49:6, 49:9, 96:21, 107:7, 109:10, 114:10, 134:6
press 163:22
pressed 102:24
pressing 203:2
pressure 33:19, 96:6, 181:2, 255:7
Presumably 198:17, 268:14
Presumpscot 144:14, 195:21
presumptions 218:13
pretty 19:22, 31:3, 46:5, 46:20, 66:2, 172:7, 172:24, 177:9, 215:16, 228:24, 239:14, 275:1
prevalent 92:5
prevent 55:8
preventing 180:18
previous 97:6, 178:24, 224:7, 257:4, 257:17, 259:16
previously 124:3, 265:2, 285:17
price 90:18, 92:7, 92:9
prices 101:15
Primarily 75:3, 156:18, 207:15, 255:21
primary 112:20, 115:22, 116:12, 116:16, 178:20
prime 246:23
principally 240:15
principals 240:10
principle 192:4, 240:13, 240:22, 241:6, 241:8
principles 240:17
print 78:19
printed 242:22
Prior 12:2, 13:23, 39:11, 62:4, 72:13, 87:22, 90:6, 107:20, 111:21, 122:7, 164:9, 235:11, 259:23, 264:15
prioritize 207:3

probably 30:18, 60:10, 60:11, 63:3, 73:9, 145:21, 167:6, 180:24, 181:4, 185:23, 203:1, 209:12, 210:23, 223:5, 243:23
problem 129:14, 155:6, 163:2, 163:4, 163:7, 165:17, 167:12, 246:10, 257:20, 274:16, 277:10, 277:11, 280:14
problematic 246:5
problems 110:5, 127:15, 201:4, 206:8
Procedural 16:13, 17:7, 17:9, 48:9, 95:6
Procedure 12:21, 214:10
procedures 57:1
proceed 24:6, 39:23, 45:7, 54:16, 54:17, 72:18, 74:9, 74:13, 78:16, 80:5, 95:20, 99:21, 107:5, 127:17, 168:22, 201:3
proceeding 12:7, 13:11, 18:25, 50:16, 52:12, 116:7, 282:6, 283:3
PROCEEDINGS 9:1, 16:2, 16:8, 18:19, 19:9, 20:5, 30:2, 96:13, 290:5
processes 23:15, 190:11
processing 9:21, 22:3, 23:4, 75:18, 206:16
produce 29:17, 85:3, 159:21, 173:16, 176:1, 186:4, 187:24, 188:1, 189:23, 238:11, 238:15, 280:21, 283:10
produced 139:18, 187:19, 279:11
producing 25:8, 135:14, 214:14
product 20:24, 22:4, 24:23, 29:18, 29:19, 29:21, 30:17, 64:19, 65:18, 88:6, 89:21, 89:22
productions 31:12
productive 16:10
products 64:24
professional 110:11, 112:3, 114:23, 165:15, 165:24, 166:17
professionalism 15:25
professionally 16:5
professionals 253:22, 254:5
Professor 285:2, 285:4, 285:7, 285:9, 288:2
profile 193:19, 206:23
profit 63:10, 82:21, 89:2, 89:6, 89:21, 92:12
profits 89:18
Program 11:20, 155:23, 156:25, 162:8, 164:25, 196:10, 221:2, 233:24, 240:2, 248:3, 248:5, 248:15, 248:18
Programs 5:8
progress 257:18, 277:24
prohibit 252:12
Projected 44:13, 82:23, 137:9
projection 61:18, 210:21
projections 65:1, 82:22, 158:19, 229:18, 286:6
Projects 20:12, 20:14, 20:16, 25:20, 28:20, 39:7, 39:15, 40:14, 41:2, 60:13, 62:25, 63:4, 63:19, 67:3, 68:16, 68:19, 84:23,

85:25, 101:14, 255:24
promise 164:3
promises 282:24
prompt 87:10
promulgated 98:23
pronouncing 134:19
proof 37:9, 46:22
properly 92:18
properties 230:23, 279:21
property 98:18, 155:15, 177:25, 201:12, 201:14, 230:8, 237:23, 256:6, 256:8
proposal 98:3, 164:22, 238:22, 241:22, 283:8
propose 21:25, 78:11, 83:18, 124:21, 149:13, 180:14, 193:16, 215:17, 216:20, 241:18, 284:21
proposes 22:24, 75:24, 77:1, 83:16, 109:5
proposing 25:15, 26:19, 60:19, 70:9, 173:2, 188:20, 238:11
protect 98:19, 120:10, 212:2, 286:20
protected 25:8
protecting 98:21, 287:13
Protection 1:3, 1:5, 9:4, 9:11, 9:12, 10:7, 11:9, 21:9, 23:9, 32:22, 77:9, 105:7, 108:16, 240:19
protective 113:23, 115:18, 122:3, 133:18
protein 283:9
protocols 53:24, 54:1, 55:3, 55:6
proud 27:8, 30:4
prove 68:5, 174:23, 253:20, 281:20
proven 174:18, 284:25
provide 20:22, 21:2, 23:14, 41:7, 44:4, 44:12, 44:14, 47:1, 49:13, 67:18, 81:22, 83:4, 90:9, 92:25, 108:16, 148:5, 158:19, 183:2, 183:23, 197:21, 218:10, 227:16, 228:2, 239:2, 247:2, 279:5, 286:16
provided 21:3, 36:8, 46:19, 81:18, 82:21, 82:25, 88:5, 93:4, 111:17, 135:10, 136:2, 136:7, 137:3, 143:12, 234:17, 243:3, 254:1, 285:8
provides 121:14
providing 50:11, 54:19, 170:15, 170:22, 282:16
proving 174:24, 174:25
provision 86:11
proximity 27:11
publicly 284:22
published 12:24
pull 28:19, 62:15, 184:15
pulling 224:19
pulls 182:17
pump 176:20, 217:17, 239:13, 239:17, 239:23, 240:4, 245:1, 245:4
pumped 177:3, 197:13, 197:15, 238:3
pumps 238:18
purchase 41:17, 90:6, 90:12, 119:5, 150:21, 168:1
purchased 97:22, 116:22, 119:2
purchasing 167:7
pure 187:19, 187:24
purpose 14:21, 16:17, 21:19, 108:22,

117:14, 248:15
purposely 84:5
purposes 12:14, 17:11, 50:3, 181:19, 181:20
pursuant 9:9, 12:20, 72:24
pursue 163:23
pursuit 34:24
purview 49:2
push 219:12, 229:17
puts 228:10
putting 281:25

< Q >
qualified 155:6, 165:14, 165:24, 166:24, 253:23, 254:5, 254:7
QUALITY 2:14, 10:22, 15:1, 23:15, 29:18, 53:25, 55:5, 78:8, 102:4, 107:23, 163:9, 163:11, 164:5, 164:23, 165:25, 166:19, 227:1, 229:2, 230:16, 241:20, 258:2, 260:9, 268:24, 269:2, 269:4
quantitative 110:2
quantities 174:16, 285:25
quantity 108:3, 151:11, 153:18, 155:3, 164:4, 164:13, 165:18, 166:19, 170:1, 171:4, 171:8, 171:11, 171:16, 173:20, 227:1, 227:6, 227:17, 230:15, 241:21, 257:1, 258:1, 258:2, 268:24
quarantine 21:25, 109:3
questionable 260:16, 282:24, 285:12
questioner 14:25
questioning 14:16, 48:19, 168:22, 171:2, 240:12, 268:22
queue 220:12
quick 30:9, 110:21, 134:17, 262:3
quickly 19:22, 114:1, 169:23, 205:10, 205:11, 205:12, 213:22, 214:12, 238:14, 269:17
quiet 184:19
quite 25:25, 59:10, 68:13, 75:21, 90:16, 94:13, 152:7, 152:10, 152:15, 158:17, 162:18, 162:21, 164:3, 201:25, 202:1, 209:16, 210:8, 210:16, 245:20, 287:17
Quote 42:18, 81:21, 83:2, 97:20, 100:20, 101:6, 101:13, 101:17, 101:25, 102:2, 102:3, 136:12, 139:4, 143:10, 143:19, 148:7, 281:8
quoted 168:16, 285:19
quotes 101:4, 101:22

< R >
R&D 29:10
rain 136:12, 137:1
rainfall 210:21, 212:20, 213:3, 213:4, 213:5, 213:8, 213:10, 213:11
raining 178:21, 178:22
raise 9:18, 15:18, 43:25, 61:1, 69:24, 70:3, 82:12,

100:3, 152:14, 208:19
raised 35:21, 38:20, 43:4, 43:18, 44:2, 46:10, 51:5, 82:4, 99:25, 287:17
raising 36:11, 268:23
ramp-up 193:16, 193:19
ramped 173:1, 173:6
ramping 247:15
ran 204:6, 238:17
range 60:11, 62:25, 120:20, 188:1, 188:14, 188:18, 200:21, 200:25, 224:12, 244:23, 245:3, 249:12
ranges 204:5, 226:13, 239:9
ranging 63:22
Ransom 114:17, 136:3, 139:24
rapid 30:20, 209:20, 212:4, 283:15
rate 62:24, 71:24, 111:10, 118:18, 149:13, 149:14, 173:3, 174:9, 205:7, 233:6, 286:4
rates 112:16, 171:12, 172:19, 174:12, 204:6, 232:9
rather 106:12, 199:4, 252:24, 252:25, 253:22
rating 152:16
ratio 31:3, 67:8
ration 214:23
rations 108:25
ratios 216:10
reach 120:15, 128:14, 145:25, 146:2, 196:6, 233:17
reached 26:6, 67:1, 67:5, 248:9, 248:12
reaching 31:7
react 230:12
reactions 193:20, 215:21
read 16:15, 33:15, 41:4, 88:17, 93:19, 103:21, 134:14, 136:15, 136:22, 137:4, 145:23, 146:5
readily 85:20
reading 46:16, 92:6, 157:3
ready 30:6, 33:21, 36:19, 64:22, 65:18, 74:12, 95:3, 202:23
Real 30:9, 34:14, 171:16, 202:10, 233:2, 237:19, 268:15, 269:17, 277:6
reality 222:13
realize 168:11
realm 84:10, 212:10
rear 257:18
rearing 207:2, 207:12
reason 12:11, 41:12, 43:19, 56:20, 77:22, 97:10, 108:20, 151:9, 163:10, 213:24, 214:1, 236:7, 250:3
reasonable 83:4, 112:4, 117:24, 145:17, 211:5, 218:13, 268:23, 269:14
reasonableness 269:10
reasonably 136:8, 139:9, 155:5, 156:15
reasons 28:6, 75:3, 143:20, 153:3, 218:2, 276:12
reassembled 123:14
reassess 225:21
reassuring 285:24
rebalance 175:20, 239:2
rebalanced 175:20
rebuilding 167:24
rebuttal 149:22
recall 179:24, 195:19
recede 205:11
receipt 66:18

receive 13:9, 76:11, 251:17
received 13:20, 29:5, 39:16, 45:23, 65:23, 66:5, 99:1, 99:14, 159:3, 168:7
receiving 65:24, 66:14
recent 17:21, 25:13, 49:16, 192:8, 192:23, 281:15, 286:11
recently 168:5, 193:2, 236:18, 274:21
recess. 123:12
recharge 136:11, 136:25, 141:14, 141:16, 141:25, 142:1, 142:4, 142:11, 142:16, 142:17, 142:19, 174:12, 176:24, 178:10, 178:14, 178:17, 178:18, 178:20, 179:4, 179:6, 203:23, 204:6, 204:9, 204:11, 231:5, 231:7, 231:21, 236:18, 237:8
recirculating 107:14
reckless 103:6, 286:13
recognize 79:23, 112:25, 228:4, 228:11
recognized 113:3, 142:15
recollection 135:8
recommend 52:9, 138:17, 148:14, 248:21, 248:23, 284:12
recommendations 113:5, 113:12, 113:22, 137:21, 138:1, 148:18, 149:6
recommended 118:17, 138:22, 148:20, 148:22
recommending 139:5
reconcile 224:14
reconciling 224:13
reconfigure 225:22, 289:14
reconfiguring 189:20, 226:1
record 11:4, 13:19, 16:20, 16:25, 29:13, 29:14, 29:15, 30:19, 37:3, 38:24, 49:4, 114:16, 116:9, 213:14, 245:14, 266:10, 270:11, 275:20, 278:2, 278:23, 283:2, 287:16
recorded 11:22
recording 194:5, 194:8, 194:9, 237:17
records 239:20, 264:22, 265:2, 265:5, 265:8
recourse 84:5
Recross 72:19, 74:4, 93:13, 93:14, 106:11, 250:25, 271:11, 273:21, 273:22, 275:9, 277:2, 288:12
recurrent 178:19
recycle 107:16
recycled 129:23
recycling 209:24
red 22:21
redirect 72:19, 74:4, 87:8, 87:17, 92:21, 106:11, 250:25, 269:19, 270:1, 271:11, 276:24, 277:2, 288:11
reduce 22:10, 120:1, 201:1, 211:17, 214:11, 221:3, 221:21, 221:22, 225:1, 248:12, 279:19
reduced 108:25,

139:2, 142:17, 179:6, 189:23, 279:23, 280:2, 281:9
reduces 141:25, 214:12
reducing 20:23, 109:1, 122:22, 248:23, 250:12
reduction 119:24, 142:2, 142:4, 142:19, 142:20, 147:9, 147:10, 204:9, 212:12, 250:4
redundancies 153:1, 189:18, 189:25, 201:8, 224:19
redundancy 108:10, 150:25, 221:1, 221:4, 221:7, 222:24, 224:10, 224:15, 225:9
Reeves 78:17
refer 93:24, 115:25, 116:3, 117:7, 136:16, 138:9, 169:11
reference 35:13, 81:8, 84:12, 92:3, 97:9
referenced 59:25, 175:5, 231:23, 265:6
referred 21:13, 104:20, 208:3, 240:11
Referring 52:23, 79:21, 103:24, 109:17, 144:7, 144:14, 153:20, 153:25, 154:3, 178:5
refill 125:4, 125:14, 126:2
refilling 52:19, 129:20
refinements 113:17, 113:21, 143:10
reflect 89:20, 147:14, 210:25, 219:20, 229:5
reflected 176:16
reflective 36:3
refresh 117:1, 216:13, 216:19
regard 80:21, 150:1, 176:18, 194:13, 238:2, 238:22, 244:11, 279:16, 285:19
regarding 54:4, 87:21, 92:24, 116:9, 134:10, 253:13, 268:23
regardless 153:23, 154:6
regime 203:18
regimens 137:9
region 144:8, 204:14, 210:19, 213:1
regional 213:5
regular 15:13, 128:6, 150:7, 164:23
regularly 120:25
regulate 32:16, 189:5
regulated 23:18
regulations 18:6, 23:8, 32:15, 46:25, 49:13, 76:23, 77:7, 78:1, 78:9, 84:13, 92:24, 92:25, 93:25, 98:23, 154:13, 155:10, 228:7
regulatory 27:19, 76:20
Reid 2:9, 11:13, 20:3, 31:20, 109:11, 114:11, 114:12
reimbursed 168:14
reiterate 39:13, 68:20, 241:11
reknown 127:20
relate 255:15, 256:10
related 58:16, 102:4
relates 210:6, 232:5, 232:6, 235:20
relation 50:7
relationship 215:6, 215:11, 223:1, 223:8
relative 110:21, 113:22, 113:23, 170:2, 171:7,

256:25,
258:3, 259:17
relatively
100:21,
100:22,
156:22,
171:20,
173:22,
178:18,
185:20,
215:23,
229:24,
233:15,
272:14,
283:15
relaying 227:13
relevance
14:23, 50:12,
53:14, 55:19,
57:21
relevant 16:12,
49:12, 49:17,
50:18, 54:12,
54:14, 54:20,
56:8, 110:10,
126:17,
128:13,
176:12
reliable 23:14,
91:13, 117:18
reliably 229:17
reliance
108:20,
280:4, 281:11
relied 158:19,
158:20,
205:13
rely 150:25,
169:25, 227:6
relying 50:10,
282:14
remain 21:10
remainder
107:21
remained 195:24
remaining 11:1,
82:16, 100:3,
141:14,
252:11
remains 122:2,
145:14,
180:16,
183:11
remarks 24:5,
97:24, 99:20,
159:6,
278:24,
284:13
remediation
163:23
remediations
167:15
remedy 163:13,
280:14
remedying
121:15
remember 99:5,
100:24,
195:22,
196:13,
231:4, 264:3
remind 19:11,
175:14,
211:19
reminder 49:7
removal 23:17
remove 76:1,
77:1, 77:2,
154:9
Rensselaer
255:18
repair 167:24
repaired 150:14
repairing
150:17
repairs 269:20,
279:6, 279:9
repeat 99:16,
109:5, 209:13
repeatedly
58:7, 58:9,
58:18, 100:6,
102:24,
284:23
rephrase 50:23
replace 76:4,
214:18,
230:14
replacement
76:8, 152:9,
230:22, 231:1
report 111:19,
115:24,
141:15,
155:6,
195:20,
213:8, 242:3,
261:1,
264:19,
265:12,
266:1,
266:10,
275:5, 275:12
Reported 1:23,
100:6, 280:10
Reporter 1:24,
11:25, 290:2
Reporter/notary
290:13
Reporting 11:25
reports 53:10,
150:9,
166:21,
224:1,
262:15,
274:20,
275:17
represent 12:5,
74:16, 144:8,
144:11,
144:13,
144:17,
144:19,
144:22,
145:7, 176:5,
183:1, 227:24
representation
112:4, 145:3,
145:17,
145:21,
161:17,
174:11,
227:15, 228:1
representations
183:2
representative
15:10,
288:23,
288:25
Representatives

13:13, 17:3, 17:22, 289:10
represented 161:18, 212:13
representing 175:22
represents 117:17, 136:12, 137:1, 146:21, 148:20, 165:2, 173:4
Republican 13:1, 96:4, 280:10
request 11:24, 18:13, 282:7
requested 13:5, 18:20, 222:12, 235:16, 284:11
requesting 225:14
requests 166:14
require 68:4, 75:17, 84:14, 86:17, 118:3, 152:10, 155:10, 159:18, 195:6, 226:10, 230:14, 232:10, 234:23, 240:24
required 13:4, 34:25, 41:21, 45:22, 69:2, 71:12, 113:15, 119:25, 155:24, 168:19, 220:23, 246:2, 249:9, 252:23, 262:20, 270:13, 271:17
requirement 71:20, 260:13
requirements 9:10, 16:22, 17:19, 23:3, 33:12, 68:25, 76:20, 76:22, 93:4, 94:7, 105:5, 120:17, 122:16, 159:9, 159:13, 165:1, 192:21, 193:2, 200:2, 200:4, 268:4, 268:7, 274:24
requires 81:20, 82:1, 82:15, 83:2
requiring 109:4
requisite 40:7
Research 3:43, 13:13, 115:6, 115:7, 115:8, 260:9, 276:6
researching 98:2
reserve 18:23
reservoir/pond 136:14, 137:4
Reservoirs 118:11, 120:14, 144:9, 146:1, 183:1, 183:20, 231:15, 237:2, 261:5, 261:6, 261:11
reside 233:13
residence 145:25
resident 104:25, 166:19
residential 233:25, 252:15, 252:16
residents 74:20, 74:23, 192:17
resiliency 108:10, 121:24, 150:25, 191:3
resilient 27:4, 119:20
resolved 190:12
Resource 21:9, 23:9, 113:13, 114:8, 120:18, 137:25, 138:3, 145:16, 164:1, 170:16, 170:22, 211:19, 218:4, 227:14, 232:7, 267:11, 268:5, 277:3
respect 50:22, 52:11, 52:12, 107:3, 145:10
respectful 106:21, 218:4
respects 75:7
respond 33:19, 49:9
responded 97:17
responding 68:16
response 143:11, 143:24, 146:8, 176:22, 212:17
responses 111:6, 177:12
responsibility

286:19
responsible 34:13, 58:6, 108:5, 122:14, 165:7
responsibly 85:21
rest 31:10, 107:12, 114:24, 246:14, 283:20
restate 49:22, 49:23
restore 74:24, 256:17
restoring 259:18
restrict 222:17
restrictions 222:14
restrooms 12:18
result 78:7, 133:19, 133:21, 203:18, 236:24, 239:14, 260:12, 261:22
resulted 143:10
results 112:8, 113:4, 144:15, 173:17, 211:3, 232:9, 236:23
resume 123:10
retained 110:22
retains 19:3
retired 80:15, 274:11
return 63:1
reuse 107:18, 129:24
revenue 89:25, 91:8, 202:8, 225:5, 279:4, 279:5, 279:11
review 11:4, 14:22, 15:13, 23:20, 33:24, 113:19, 143:15, 154:22, 154:23, 166:25, 217:2, 234:20, 234:23, 255:15
reviewed 80:20, 115:6, 143:6, 143:14, 267:16, 274:7, 277:7, 277:19
reviewer 143:9
reviewing 110:20, 165:8, 217:2, 275:17
revised 143:16, 144:4, 192:9, 225:19
revisions 116:10
revolved 115:14
rewind 255:25
Rhode 20:9
richer 25:4
rid 248:14
right-hand 21:4
rigorous 157:23
rise 177:5, 205:11
rises 169:23
risk 100:14, 100:22, 101:2, 102:4, 102:5, 121:5, 122:14, 122:15, 156:21, 171:4, 174:2, 177:19, 198:8, 221:7, 221:17, 265:18, 277:17
risky 100:9
Rivers 23:24
Road 4:42, 5:9, 69:9, 121:14, 201:18, 234:22, 273:4
roads 180:9
Robert 1:20, 2:6, 11:8, 11:12, 85:19
Robin 1:23, 12:1, 278:21, 290:2
robust 74:25, 77:25, 111:15, 114:4, 120:21, 122:3, 193:6, 203:15, 227:15, 229:15
robustness 203:17
rock 156:11, 156:12, 229:19
role 20:15, 35:6, 110:21, 110:25, 115:10, 115:14
rolling 48:15
room 11:7, 12:10, 12:16, 14:13, 62:17, 65:12, 95:5, 123:20, 123:22, 218:25, 221:19, 221:22, 250:22, 278:6, 289:14
roughly 161:1, 194:15, 198:15, 216:3
rounded 283:13
Route 20:19, 21:4, 85:13,

252:20,
252:21,
274:18,
287:20
rule 285:9
ruled 127:11
Rules 9:13,
12:22, 33:13,
58:22, 58:24,
73:1, 86:2,
86:7, 86:23,
94:11, 98:23,
117:3, 117:8,
117:9,
148:23,
154:14,
240:21
run 21:2,
37:10, 89:2,
102:21,
142:16,
143:1, 143:3,
147:7,
147:16,
152:20,
183:21,
190:3, 190:4,
200:10,
203:21,
213:2,
216:16,
232:24, 233:4
Rune 100:17
running 19:17,
54:12, 56:10,
85:21, 140:4,
224:22
runs 161:1,
252:20
Ruth 2:17,
11:16, 251:20

< S >
saddled 56:11,
56:17, 57:9,
58:11, 59:10,
104:22, 106:7
safe 198:17,
198:24
safely 137:17,
150:14,
150:16,
172:13
Saggese 4:41
salaries 51:8
sale 88:6,
167:23
sales 65:3,
65:8, 89:21
saline 160:16,
161:11,
162:1, 163:4,
175:24
salinities
153:8, 190:8
Salmon 1:12,
9:5, 9:20,
20:23, 22:1,
25:10, 26:17,
28:14, 32:10,
32:13, 38:5,
38:7, 64:5,
64:23, 65:14,
75:16, 75:18,
91:11, 92:3,
92:7, 100:21,
159:17,
187:19,
200:16,
283:9,
283:11,
283:12
salmonbusiness.
com 100:11,
101:22,
285:18
samples 164:23,
165:25
San 279:24
sandy 115:4
Sanford 2:6,
6:16, 7:22,
11:12, 62:20,
62:21, 62:22,
203:3, 203:6,
203:8,
204:18, 210:6
sanitary 246:14
Sapphire 26:7,
63:19
satellites
281:7
satisfied
204:25,
205:6, 289:17
satisfy 120:17,
193:1, 241:5
saturated
186:15
saw 27:11,
41:18,
147:12,
179:6,
191:12,
211:1,
226:19,
236:20,
237:18,
260:22
saying 29:23,
36:25, 55:5,
62:10, 65:11,
68:22, 73:12,
101:24,
131:8, 154:4,
174:7,
189:11,
199:19,
212:7,
219:20,
221:8,
221:24,
224:14,
246:6,
258:10,
283:8, 285:19
says 43:24,
45:14, 101:5,
101:15,
102:3,
123:19,
142:1,
174:25,
179:7,
204:13,
228:5, 269:11
scale 28:7,
29:1, 60:19,
60:21, 63:7,

63:9, 63:13, 63:22, 64:4, 64:6, 107:24, 225:23
scaled 30:23
scaling 26:11, 28:8, 31:3, 63:12
scenario 111:16, 112:8, 143:2, 143:4, 147:15, 147:17, 150:2, 171:18, 172:17, 173:21, 173:24, 174:14, 179:6, 204:7, 211:11, 222:7, 226:23, 232:25, 233:5, 243:14
scenarios 52:23, 57:14, 77:15, 111:8, 125:22, 125:23, 137:12, 137:13, 137:16, 172:18, 173:17, 179:2, 182:17, 204:7, 211:12, 212:8, 221:16, 222:6, 226:12, 226:13, 232:6, 232:14, 248:22
schedule 14:12, 72:9, 72:20, 106:21, 106:24, 114:15, 123:2, 216:21, 216:25, 272:14, 278:5
scheduled 17:24, 94:22, 278:4
School 5:8, 115:9
Science 27:18, 32:11, 109:21, 109:23, 114:21, 221:8
scientific 29:9, 249:2
Scientists 286:6
scope 19:6, 53:14, 141:7, 259:21, 283:24, 287:25
screaming 280:25
screen 20:25
se. 257:3
sea 101:17
seafood 26:15, 27:8, 27:9
search 27:7, 78:9, 265:2, 265:5
Searsmont 4:18
seasonal 202:14
seasonality 148:24
seasons 216:23
seaward 243:24
seawater 159:22, 187:20, 187:25, 189:3, 207:16
Second 18:10, 67:4, 70:18, 75:5, 81:19, 87:6, 91:1, 112:14, 112:15, 144:18, 216:4, 240:25
Secondarily 28:7
Secretary 48:25, 49:16
Section 17:9, 36:9, 79:22, 92:23, 93:11, 93:19, 94:1, 136:17, 143:18, 144:4, 145:22, 154:14, 154:20, 182:1, 231:14, 244:16
Sections 12:21, 23:24, 70:14, 154:18, 244:3
secure 102:25, 103:5
secured 34:19, 102:10
sedimentary 115:4
sedimentation 10:13
Seeing 24:6, 26:10, 26:22, 27:1, 31:7, 31:16, 34:3, 63:14, 71:24, 72:18, 87:2, 173:7, 173:10, 211:2, 213:16, 213:19, 226:8, 234:8, 250:18, 269:23, 270:24, 275:10, 288:11

seek 70:10, 99:4
seeking 70:1, 99:7, 218:21
seem 74:13, 278:4
seems 59:4, 90:8, 104:6, 128:8, 128:12, 261:12, 262:16
seen 20:19, 22:20, 25:18, 30:21, 39:1, 63:4, 63:5, 63:25, 71:21, 91:16, 122:8, 150:5, 197:6, 213:12, 266:2, 267:18, 277:15, 279:23
seeping 262:6
sees 195:3
segment 27:24, 28:4, 28:23, 61:5, 108:2
segments 108:4, 144:14
select 158:16
selected 33:10, 75:21, 108:8
selectively 145:23, 242:22
selectmen 280:15
Self-cleaning 129:7, 129:8
sell 36:20, 64:24, 168:8, 201:14
selling 29:18
Semiconductor 34:12, 34:13
seminars 110:11
send 177:22
Senior 20:15, 34:10, 34:19, 78:18
sense 69:23, 111:16, 194:22, 218:18, 222:6, 222:19, 225:8, 234:14, 246:25
sensitive 71:15, 120:11, 122:4, 147:11, 206:21
sensitivity 142:18, 142:20, 147:8, 147:12, 179:4, 179:7, 179:8, 203:22, 204:8, 211:16
sent 13:3, 279:13, 281:4
sentence 129:1
separate 93:6, 219:23
September 127:21, 128:4
sequestering 98:12, 98:14
series 108:9, 108:12, 118:13, 140:8, 184:23, 210:11, 211:12
serious 26:24
seriously 286:23
serve 121:4
Service 12:1, 151:7, 151:25, 168:19
serviceable 150:7
serving 74:19
session 94:14, 288:14
set 16:13, 29:21, 33:13, 33:21, 45:2, 45:4, 48:8, 75:9, 76:11, 78:2, 107:5, 112:6, 123:24, 158:3, 193:1, 193:6, 195:15, 198:4, 200:21, 218:17, 240:17
sets 77:23, 113:19
setting 33:7, 245:1, 246:18
settings 239:13, 239:17, 239:24
settled 74:13
seven 25:23, 34:5, 63:6, 249:12, 250:6, 251:25, 254:21
several 36:12, 83:15, 115:6, 115:7, 137:9, 141:19, 152:18, 206:11, 230:24, 231:2, 240:9, 250:5, 250:10, 253:18
severe 280:11, 286:13
severely 279:23
shall 154:25

shallow 76:13, 180:2, 185:16, 195:12, 195:15, 195:18, 239:23, 244:1, 244:2
sham 283:3
shape 110:19, 122:19
share 124:23, 269:5
shared 36:12
shareholder 36:23, 38:18, 66:2, 84:2
shareholders 37:23, 38:2, 51:6, 51:10, 66:7, 66:12, 71:18, 73:15
shaving 33:6
sheer 282:1
shift 151:12, 201:9
shifted 108:20, 198:5, 202:6
shifts 151:22, 152:2, 204:10
shipments 22:10
shipped 22:4
shore 100:18
shoreland 21:7, 21:11, 21:14
short 89:16, 98:18, 101:9, 105:25, 159:7, 173:5, 200:10, 233:15
short-term 152:3, 208:24
shortage 280:11
shorter 89:7
shot 78:13, 128:13, 134:10
show 19:15, 46:22, 52:11, 145:19, 197:9, 221:2, 248:11, 254:7, 257:6, 262:14
showed 47:22, 262:2, 267:3
showing 89:11, 243:4, 243:16
shown 17:5, 92:12, 196:25
shows 175:21, 227:20, 242:4, 243:1
shuffle 78:18
shut 214:1
shut-off 214:5
side 14:21, 101:2, 161:2, 161:6, 173:12, 181:25, 243:24, 248:20
sides 55:18, 289:8, 289:9
signal 159:4
signals 192:1
signature 160:18, 176:21
signed 290:8
significant 20:22, 23:15, 71:25, 100:23, 110:23, 115:2, 121:7, 142:10, 142:18, 142:20, 155:22, 157:9, 162:16, 176:6, 176:24, 228:24, 230:5, 232:11, 236:25, 239:15, 244:19, 253:1, 253:6, 287:12
significantly 31:9, 162:21, 187:4, 226:8, 226:15, 261:22
silence 12:12, 12:15, 19:11
silt 72:12, 206:25
silton 142:9
similar 21:19, 39:15, 60:15, 65:24, 67:3, 67:9, 163:5, 197:16, 213:10, 234:15, 234:17, 268:21
similarity 65:23
similarly 50:8
simple 212:12
simplification 176:3
simplifying 184:6
simply 180:20, 199:4, 200:4, 212:5, 228:8, 230:25, 258:10, 284:18, 285:14, 286:4
simulate 157:19, 171:18, 172:18, 182:4, 233:7
simulated 173:17, 175:18, 232:13, 237:9
simulates 233:3
simulating 112:21,

176:8, 233:9
simulation
147:7, 172:5,
183:15,
233:19,
242:5, 242:20
simulations
118:20,
178:24,
183:21,
232:9, 244:8
single 29:24,
33:14, 77:5,
146:21,
161:16
sink 185:22
sinks 175:17,
175:20,
183:19,
184:25, 239:3
sir 131:12,
274:10
Sirota 4:17
sister 35:10,
50:4
sit 31:23,
91:5, 174:20
site-related
138:7,
138:23, 139:4
sites 75:10,
252:16,
252:17
sits 240:16
sitting 12:1
situation
151:19,
151:24,
162:1,
163:14,
166:25,
186:18,
190:10,
190:12,
190:24,
191:1,
191:18,
203:21,
214:23,
224:21,
225:6,
235:10,
244:4, 244:9,
248:21
situations
55:13,
190:17,
190:24,
191:2, 241:14
six 30:19,
63:6, 249:12,
254:11,
254:12
size 21:23,
25:15, 26:9,
30:16, 75:20,
85:2, 229:13,
247:9,
284:17,
284:20,
285:15
sizes 124:25
skeptical
100:12,
100:15
skepticism
100:7, 285:7
skip 98:16
slack 246:8,
246:14
slaughtered
128:15,
128:17,
128:22,
129:21,
283:14
slaughtering
52:17
slide 19:15
slides 17:4,
17:12, 17:14,
17:17, 18:9
slightly 64:4,
145:9
SLODA 32:20,
33:12, 40:20,
42:12, 57:21,
59:15, 79:3,
79:24, 81:6,
105:5,
120:17, 156:3
slow 76:12,
174:15
slower 210:2
slows 214:22
Small 22:16,
74:18, 78:19,
80:24, 85:2,
85:5, 107:21,
146:4,
153:18,
171:20,
182:17,
193:18,
283:21,
285:20
smaller 36:3,
64:3, 64:4,
103:10,
225:16, 253:5
smoke 281:4
smolt 9:20,
21:24, 62:2,
62:3, 126:3,
127:1,
193:17,
200:16,
207:4,
208:11,
216:7, 217:5
so-called
200:19
software 112:3
soil 75:22,
76:8, 98:14,
144:15
soils 76:1,
76:4, 77:2
sold 64:21
sole 169:22,
170:6
solely 18:3,
150:25
solicited 98:25
solid 101:20,
102:10
solidly 287:17
soluble 146:23,
258:5
Somebody 45:1,

165:23, 166:1, 166:21, 252:6, 259:15, 270:6, 274:6, 289:18
somehow 88:25
someone 96:14, 104:8, 105:8, 105:21, 106:3, 275:16
Sometimes 89:10, 116:3, 126:23, 185:5, 185:6, 246:11, 246:16, 248:8, 248:12
somewhat 160:21, 170:15, 222:2, 248:18, 278:20
Somewhere 26:1, 60:11, 193:10, 208:25, 209:4, 250:22
soon 73:8, 193:5
sophisiticated 81:1
sophisticated 85:3
Sorry 24:10, 24:15, 64:11, 69:17, 87:9, 88:13, 88:16, 93:21, 94:12, 95:22, 109:5, 147:23, 154:11, 193:3, 208:13, 227:1, 259:22, 270:2, 272:22, 273:15, 275:14, 277:2
sorts 81:18
sought 104:2
sound 19:23, 42:23, 102:6, 264:1, 264:7, 266:21
Sounds 52:6, 232:14
Source 23:10, 33:4, 82:19, 108:19, 116:23, 119:1, 119:22, 136:12, 137:2, 142:1, 153:23, 154:6, 169:22, 170:8, 178:20, 189:22, 190:5, 198:13, 212:13, 246:13, 246:23
sources 108:10, 109:8, 112:20, 117:1, 119:18, 121:25, 148:1, 151:10, 152:24, 175:16, 175:20, 183:15, 183:19, 189:19, 190:4, 190:5, 201:9, 204:16, 205:8, 209:10, 219:9, 220:15, 220:16, 223:2, 239:3
South 178:3, 180:1, 198:6, 213:19, 238:7, 281:6
south/southeast 164:15
southeast 160:13
southeastern 118:22, 161:5, 164:20
southern 20:18, 196:16
Sovdsnes 100:17
soy 283:20
space 63:11, 181:23, 209:5
spades 280:23
Sparebank 100:17, 101:5, 101:12, 101:15, 101:18
spatially 232:10
speaking 95:15, 209:19
specialized 28:22
species 64:1, 98:10
Specific 90:15, 103:21, 111:20, 132:13, 136:17, 143:1, 143:3, 154:18, 162:23, 172:20, 240:5, 268:6, 269:4
Specifically 13:5, 49:13, 80:21, 82:9, 86:16, 95:18, 110:24,

118:23, 140:1, 142:22, 159:12, 161:18, 172:7, 198:7, 204:3, 256:7, 257:10, 260:6, 268:3, 269:2
specifics 258:15, 273:1
specified 81:22, 203:23, 260:25
specifying 81:23
speed 95:8, 278:22, 286:15
spelled 114:17
spend 211:14
spent 27:24, 168:12, 168:14, 255:21
spew 98:5, 282:10, 283:18
spewed 124:18
spilling 133:20
split 70:14
spongy 75:22
spot 252:5
spring 45:19, 45:20
square 22:17
stability 150:8, 203:11
stabilization 232:10, 232:11, 232:23, 233:17, 248:8
stabilize 112:18, 171:13, 233:4, 236:24, 243:20, 247:10
stabilized 233:18, 235:17
stabilizes 239:2
stable 208:23
Stadium 75:20
stage 26:6, 67:2, 67:18, 147:9, 173:2, 207:3, 246:20
staged 238:18
stages 172:25, 187:16, 206:21
stained 273:5
stand 15:18
standard 33:17, 85:22, 171:2, 171:4, 206:17, 246:18, 253:19, 283:19
standards 31:8, 32:18, 55:11, 59:15, 71:21, 78:2, 78:7, 90:20, 121:11, 121:13
standing 239:11, 241:15
standpoint 244:13, 246:6, 246:10
stands 142:8, 269:18
star 255:5
start 43:23, 45:11, 51:22, 62:7, 63:9, 63:10, 65:7, 68:19, 69:25, 101:14, 106:23, 109:12, 123:4, 152:22, 170:14, 172:2, 173:10, 181:3, 193:5, 193:17, 201:5, 211:25, 213:19, 216:22, 217:20, 245:24, 252:4, 279:2, 286:22
start-up 25:25
started 16:24, 19:9, 23:1, 25:21, 39:8, 61:6, 96:20, 123:14, 173:7, 193:15, 201:20, 289:7
starting 15:5, 73:18, 90:7, 123:24, 190:11, 193:11, 229:7
Starts 45:18, 45:20, 62:12, 217:3
State-of-the-art 32:11, 112:2
stated 51:24, 52:10, 53:16, 67:16, 88:2, 89:4, 95:23, 97:19, 97:25, 98:13, 104:6, 105:20, 122:16, 122:20, 136:25, 150:15, 155:11, 204:24, 281:20, 284:20

STATEMENT 6:3, 13:22, 14:1, 24:9, 24:11, 24:13, 31:17, 43:7, 83:24, 95:4, 95:9, 95:18, 119:23, 137:23, 138:17, 143:24, 224:16, 272:19
statements 74:8, 82:23, 89:24, 99:22, 106:4, 268:25
States 17:10, 40:22, 75:16, 100:14, 143:19, 271:23, 286:18
static 112:14, 237:3, 237:4
stating 52:14, 53:10, 199:4
station 77:19, 213:11
statistics 117:4, 205:16, 213:3
status 19:3, 45:16, 190:3
statutes 18:6, 76:23, 77:7, 78:1
statutory 16:22, 76:20
stay 185:14, 185:21, 199:6, 287:1
stayed 249:16
stays 184:7
Ste 3:30
steady 232:25, 233:19, 236:23, 242:4, 242:19, 243:12, 245:25, 246:7, 249:15, 249:25
stealing 180:15
stenograph 290:6
stenographer 278:12, 278:13
step 35:5, 35:15, 37:9, 48:5, 60:22, 60:24, 61:7, 61:8, 62:12, 66:6, 72:14, 141:18, 163:12, 172:17
step-by-step 60:23
Stepping 37:12, 69:3, 70:2
steps 45:8, 45:9, 46:6, 48:16, 63:7
steroids 280:24
Steven 2:5, 11:12
stewardship 33:14
sticking 215:12
stock 28:14, 38:8, 91:10, 92:3, 92:4
stocked 38:8
stop 214:13, 214:14, 225:4
stopped 260:23, 281:23, 281:25
stops 214:21
storage 22:12
storm 32:22, 72:12
Stormwater 10:12, 139:25, 140:7, 140:16, 140:23, 141:7, 141:19, 141:23, 142:23, 177:23, 178:5, 179:19, 180:9, 180:18
straight 184:24
strategy 27:12
strayed 273:6
straying 59:5, 127:6, 128:9
Stream 235:25, 240:21
streamed 94:18
streams 10:11, 161:1, 186:25
Streamstats 212:19, 212:22, 213:9, 236:4
Street 3:37, 3:46, 4:26, 4:35
strength 28:10, 38:10
stress 14:24, 217:19, 247:2, 257:7
stressed 214:21
stretch 144:23
stretched 281:5
stretches 144:9
strict 77:6
strictly 215:13, 277:9
strike 133:4
strong 27:17, 37:1, 37:4
strongly 43:24, 75:4, 75:8
structural 262:14, 262:16, 262:17, 274:8
structure 37:14, 41:13,

41:14, 47:3, 47:6, 47:21, 47:22, 48:5, 48:12, 49:14, 50:15
structured 35:15
structures 50:2, 75:24, 76:6, 180:21
struggle 105:10
struggling 138:24
students 115:9
studies 162:13, 204:1, 204:2, 204:5
study 162:14, 211:14
studying 98:1, 288:7
stuff 101:13, 202:14, 289:13
stumbled 25:17
subject 83:4, 95:15, 112:5, 155:14, 288:13
subjected 71:20
subjects 284:7
Submerged 23:23
submission 73:2, 86:17, 157:4
submissions 76:19, 81:7
submit 14:20, 17:25, 46:1, 251:14, 251:19
submitted 9:9, 11:3, 17:1, 23:6, 40:18, 42:20, 45:14, 46:17, 46:18, 47:5, 47:25, 68:21, 81:13, 81:14, 85:4, 99:23, 111:21, 113:15, 116:9, 131:23, 132:11, 132:24, 143:20, 155:23, 251:24, 279:12
submitting 192:9
Subpart 72:25
subsequent 36:7, 67:18, 143:7, 143:15
subsidence 279:21, 280:5
subsidiaries 24:20, 82:5
subsidiary 35:7, 35:18, 50:22
substantial 173:15, 227:20, 249:1
substantially 188:11
substantive 33:15
subsurface 120:4, 135:11, 135:12, 137:17
success 27:21, 27:23, 28:4, 82:18
successful 35:10, 36:10
successfully 34:16
suck 282:2
sudden 213:23, 213:25, 214:10, 216:8
suddenly 152:8, 209:14, 209:22
Sue 208:15
suffer 133:16
suffered 127:23, 128:5, 130:3
sufficient 42:14, 68:1, 165:18, 200:24, 248:11
suggest 245:3, 248:23, 250:3, 258:12, 258:20, 262:21
suggested 117:15, 155:13, 236:18
suggesting 139:1, 174:9
suggests 213:15
suit 163:22
suitable 123:6
Suite 3:9, 3:18
sum 29:10, 185:7
summarization 107:10
summarize 107:8, 114:1, 133:1, 175:8, 181:9
summarizes 111:22, 139:14
summary 12:2, 14:2, 78:16, 95:14, 111:24, 121:20, 170:14, 171:6, 171:9
superficial 145:7
supplemental 136:14, 137:3
supplied 83:5, 169:9, 280:20,

282:15
supplies 107:11, 108:9, 119:21, 230:15, 280:1, 280:2, 281:9
Support 36:14, 39:2, 68:22, 110:23, 111:4, 112:8, 112:10, 112:15, 112:18, 135:6, 135:10, 157:23, 171:10, 262:13
supporting 75:23, 76:6
supports 40:23, 61:21
suppose 212:16, 269:17, 269:22
supposed 47:4, 84:8, 262:4
surely 152:4, 217:15
surfaces 140:8, 140:14, 140:20, 140:22, 179:12
surficial 186:3
surpass 168:18
surprised 160:21
surrogate 157:2, 267:8
surrogates 158:2
surrounding 115:20
Survey 212:24
Susan 2:3, 11:11
susceptible 214:5, 279:18
suspect 241:1
sustain 260:2
Sustainability 279:15
sustainable 28:9, 62:23, 108:6
sustainably 167:7
Sustained 25:11, 52:3, 53:20, 55:24, 128:2, 133:5, 133:25, 284:1
swear 15:19
sweethenrys@gmail.com 4:45
switch 23:4, 190:7, 209:10
swore 96:21
sworn 15:6, 80:8, 97:1
systems 25:11, 27:3, 27:4, 85:21, 107:16, 107:19, 108:19, 115:5, 125:8, 129:7, 129:8, 129:9, 129:11, 141:19, 151:16, 185:16, 185:24, 187:25, 189:4, 190:8, 190:9, 195:8, 199:2, 199:3, 201:6, 206:12, 207:9, 214:19, 214:20, 215:19

< T >

table 11:6, 14:13, 14:21, 39:24, 74:11, 185:20, 185:21, 186:15, 186:17, 187:5
tables 288:20
tackle 235:21
tackling 106:23
tag 289:16
takeaways 111:24
talked 36:10, 36:24, 37:18, 37:19, 87:20, 115:16, 122:9, 160:12, 198:1, 218:3, 245:20, 248:2, 249:21, 264:20, 276:4, 276:7
tank 129:24, 224:23
tankfuls 52:18
tanks 22:2, 52:19, 52:20, 85:10, 109:4, 124:22, 124:25, 125:4, 125:9, 125:14, 126:2, 126:22, 128:16, 129:3, 129:20, 130:3, 152:16, 209:17, 217:7, 218:6
target 63:18, 63:20, 68:2, 199:5, 199:9, 200:24
targeting 188:17,

188:25, 198:25
task 157:22, 254:7
tasked 227:2
tasted 29:20
taught 110:12
tax 50:3, 272:11, 279:7
taxpayer 96:11
taxpayers 102:15, 103:1, 103:7, 104:21, 106:6
teaching 285:5
team 30:4, 31:24, 34:22, 118:16, 132:9, 190:21, 218:16
teams 115:7
Tech 3:36, 109:24, 109:25
technical 109:18, 110:1, 111:18, 137:22, 138:10, 144:25, 178:19, 242:13, 289:4
technicalities 107:13
technically 233:20
techniques 110:4, 110:14, 112:1
technological 102:5
technologies 30:16
technology 32:11, 33:10, 107:23, 107:24, 153:17
temperature 159:24, 160:2, 160:9, 226:8, 226:16
temperatures 226:13
temporarily 109:1
Ten 47:15
Ten. 47:14
tend 186:4, 222:4
tended 198:2
tendency 202:13
tends 231:22, 248:19
term 89:7, 161:11, 161:13
terminate 235:10
Terrific 79:1, 106:17
terrifying 110:5
test 118:8, 179:3, 191:12, 197:14, 203:22, 210:12, 215:18, 217:19, 227:23, 227:25, 237:11, 238:17, 238:18, 238:19, 266:25, 267:9, 281:19, 285:1
testified 48:22, 231:4, 277:2
testify 15:18, 17:24, 52:5, 99:12, 186:12, 256:20, 276:2
testifying 49:4, 53:18, 56:12, 87:20, 224:10, 266:7
testing 77:17, 145:18, 211:5, 217:16, 217:19, 231:17, 247:2, 257:2, 266:16, 267:3
tests 118:13, 172:22, 172:25, 210:11, 227:19, 237:21, 238:2, 238:12, 257:4, 257:6
text 242:23, 279:13
thanking 109:12
Thanks 30:11, 94:16, 97:3, 114:12, 210:5
thawing 262:7
Thaxter 3:29, 40:2, 74:16
themselves 15:25, 16:5, 103:12, 166:7
theory 129:10
thereabouts 272:3
thereafter 284:23
thereof 41:4, 274:22
They've 33:13, 38:18, 81:11, 81:12, 81:14, 82:14, 88:2, 91:9, 104:10, 110:16, 254:1, 261:12
thinking 162:14, 183:4,

211:11, 230:16
thinks 163:7
Third 70:21, 75:7, 81:25, 112:18, 116:23, 119:1, 144:21, 145:6, 207:9
third-party 166:6, 166:24
thorough 113:21, 114:4, 114:7, 121:20
though 46:16, 89:11, 232:22
thousand 25:4, 187:18
threat 26:25, 28:3, 156:19
threatened 98:10
thresholds 121:4, 121:11, 158:3, 211:23, 211:24, 234:19
throughout 14:4, 16:2, 77:14, 110:9, 110:16, 114:19
thumb 285:9
tidal 117:9
tie 186:23, 280:16
tied 72:15, 228:4
ties 72:8, 72:9
tight 142:9
Tilburg 5:6
timing 73:19, 82:22, 233:10
tiny 65:14
Title 12:21, 109:19
together 32:12, 119:19, 224:1, 245:2
toilets 206:15
tolerance 244:18
tolerate 187:17, 191:13, 191:15
Tom 111:14, 113:14, 138:14, 158:1, 176:15, 192:11, 234:10, 237:19, 242:21
tomorrow 177:22
tonight 241:2, 250:21
tonnage 62:23
tons 9:19, 26:5, 26:17, 26:18, 26:19, 32:9, 60:18, 60:25, 61:6, 63:8, 63:20, 63:22, 63:24
took 196:6, 204:4
tool 41:9, 42:1, 212:19, 212:23, 212:24, 213:9
tools 212:18
top 86:14, 142:17, 178:22, 182:24, 229:18, 240:16, 250:7, 260:15, 260:16, 260:18, 260:20, 260:21
topic 14:15, 57:21, 99:15, 107:6, 124:13, 156:8, 283:24
topics 33:9, 56:2, 110:14, 282:6, 284:11
topographic 181:16, 184:4, 203:12
total 42:17, 43:5, 60:18, 62:24, 65:15, 69:16, 120:1, 159:10, 169:20, 197:24, 220:14, 220:20, 221:10
totaling 118:8
totally 91:13, 128:19
touch 103:10, 110:21, 111:14, 111:23, 112:23, 168:5, 252:3
touched 163:13
touching 175:12
tough 257:25
toward 82:20, 164:20, 198:6
towards 46:12, 90:11, 91:1, 161:4, 161:5, 177:1, 179:14, 182:16, 198:25, 207:3, 215:24, 239:24, 248:19, 269:20
Town 163:1, 280:11
toxic 130:4, 130:11,

130:21,
130:23,
130:24,
131:3,
131:20,
131:22,
131:24,
133:7,
133:23, 134:5
toxicology
134:1
traceable 32:12
track 29:13,
29:14, 29:15,
30:19, 37:3,
38:24
tracked 76:19
trade 100:5
traditionally
202:1
trail 105:9,
105:22,
106:1, 106:2
train 77:18
trajectory
234:8
tranche 70:19,
71:1, 72:6
tranches 36:3,
70:13, 71:3
transcribe
278:18
transcribed
11:23
TRANSCRIPT 9:1,
11:23, 11:24,
290:5
transducer
196:7
transducers
195:15,
195:23,
237:17
transfer
128:19,
146:23
transferred
21:8, 128:22
transient 233:4
transport
27:14, 258:5
traps 32:4
travel 179:20
traveled 96:1
Treasurer
34:11, 34:16
treat 153:22,
154:4, 207:7
treated 10:1,
33:3, 58:23,
154:5, 206:18
treatment 9:24,
22:14, 22:15,
23:5, 23:16,
62:1, 74:22,
75:19,
108:18,
133:13,
141:21,
151:15,
151:20,
153:17,
153:19,
154:3, 170:2,
206:9,
214:21, 236:9
treatments
154:8
tremendous
25:18, 228:13
trend 213:15
trending 172:2
trends 158:4,
235:6, 235:16
tried 212:11
trigger 121:6
triggers 45:7,
158:7
tropical 160:10
trouble 198:12,
224:13
truck 76:7,
77:2, 98:13
true 53:4,
58:17, 92:25,
159:17,
160:15,
191:11,
194:4,
280:22,
280:23, 290:4
trust 256:5,
259:17,
259:18,
259:24
truth 15:20,
15:21
truthfully 52:2
truthfulness
282:5, 283:4
try 170:13,
181:9, 201:5,
212:24,
278:20
trying 18:7,
54:5, 57:19,
57:24, 59:19,
65:3, 123:17,
127:14,
128:11,
132:20,
157:19,
174:4,
174:22,
175:1, 178:2,
179:21,
185:11,
206:7, 208:7,
211:10,
216:15,
221:25,
223:13,
224:17,
241:8, 249:20
Tucker 4:8,
18:11
TUESDAY 1:16
tune 46:21
turbidity
153:11,
153:12,
154:8, 154:9,
207:1, 207:6,
272:18,
272:25, 273:2
turn 165:19,
176:20
turned 238:18,
280:17,
280:18

turning 63:10
tv 95:22
twice 29:19
tying 230:23, 231:1
type 27:16, 31:12, 49:13, 64:5, 101:3, 211:3, 212:17
types 41:12, 56:1, 68:16, 68:19, 204:3
typical 22:7, 36:15, 89:5, 248:6
Typically 46:8, 63:13, 82:2, 209:18, 234:21, 239:24

< U >
ultimate 233:18
Ultimately 10:2, 48:8, 62:7, 118:15, 140:10, 178:25, 224:2, 227:3, 286:7, 286:8
unable 16:4, 57:10, 58:13, 102:14, 102:19
unaltered 18:5
uncertain 101:18, 246:3
uncertainties 152:23
uncertainty 112:24, 113:2, 114:6, 114:7, 120:6, 120:8, 122:2, 155:18, 156:10, 228:4, 228:11, 230:4, 245:24, 246:20, 247:20
unclear 165:6
unconsolidated 144:13, 186:3, 229:22
underestimates 143:21
undergraduate 110:12
underground 197:20
underlying 120:6
underneath 187:11
underpin 224:2
understanding 30:12, 68:1, 68:4, 90:20, 156:22, 160:14, 166:6, 170:15, 179:13, 192:15, 192:20, 198:12, 210:10, 218:17, 219:18, 232:17, 240:5, 258:14, 263:5, 266:14, 270:14, 270:17, 270:25, 271:1, 272:7, 272:8, 277:6, 277:23
Understood 169:6, 201:16, 220:4, 227:12, 231:17, 247:23
undertaken 165:14
undeveloped 21:8
unexpected 120:11, 186:6
unforeseen 113:8, 212:1, 212:3
unfortunate 127:24
unfortunately 280:17
uniform 229:24
uninformed 281:17
Union 4:5, 29:6
unique 26:2, 162:20
United 75:16, 286:18
University 1:25, 5:4, 5:7, 13:14, 20:9, 109:22, 114:22, 279:15, 285:3, 285:5
unlabeled 17:18
Unless 39:21, 106:13, 168:25, 203:1, 215:1, 259:15
unlike 180:11
unlikely 77:16, 113:8, 229:15, 239:14
unprecedented 75:14
unpredictability 286:10
unpredictable 207:6
unquote 101:17, 102:1, 102:3
unrealistic 285:15
unreasonable

155:2, 171:4, 174:2, 174:25, 175:9, 226:25, 227:5, 269:7
unresolved 100:23
unsafe 260:19
unsuitable 75:5, 75:21, 76:14
until 11:3, 14:10, 17:24, 22:2, 39:18, 39:22, 45:7, 45:23, 71:18, 96:5, 190:11, 215:20, 250:5, 258:14, 262:7, 283:13, 288:14
untrue 281:20, 285:1
unused 252:18
unusual 90:8, 91:2
unwilling 102:14, 103:10
unwillingness 103:5
upcoming 151:22
update 146:7, 146:10
updated 120:25
updates 116:10
upgrade 168:13, 202:9
upgrades 121:16, 168:10, 168:15, 168:19
upgradient 140:5, 141:2
upkeep 150:7
Upper 120:14, 144:9, 144:16, 144:19, 150:18, 219:10, 226:13, 256:7, 260:6, 260:11, 262:8, 274:23, 274:25
uppermost 182:4
Upstream 3:26, 6:21, 8:3, 13:11, 40:3, 74:8, 74:17, 74:22, 76:6, 76:18, 76:21, 78:16, 80:18, 134:16, 251:10, 255:5, 255:12, 255:14
upward 189:1, 219:20
urban 280:1
urge 286:15, 286:18, 286:23
urgently 286:17
Urup 53:5, 55:16, 127:20
useful 170:3, 227:16, 228:1, 247:13, 252:3
user 241:19, 253:2, 257:23
users 115:19, 120:10, 121:2, 121:18, 122:4, 177:20, 240:23, 240:24, 241:6, 252:7, 252:8, 252:10, 252:21, 252:24, 253:9
uses 10:14, 10:23, 133:7, 193:18, 202:1, 219:14, 224:25, 287:23
USGS 212:19
Utilities 62:1, 119:9
utility 22:6, 23:2, 23:3
utilization 108:8, 224:3, 224:23, 225:4, 235:12
utilize 9:16, 220:16, 222:9, 246:24, 247:3
utilized 108:22
utilizes 107:14
utilizing 249:13
UV 153:20, 153:21, 154:2

< V >
validate 247:5
validated 227:22, 254:1
Valley 279:25
value 36:20, 172:10, 228:13
valued 84:23
variability 210:22
variable 146:22, 149:18, 158:12, 162:12, 191:1, 208:19, 216:22, 232:10

variables 208:21, 221:9, 221:25
variably 183:10
variations 120:24
varied 217:1
variety 41:10
various 66:7, 111:8, 124:25, 127:24, 221:16, 233:25, 255:20, 256:18, 258:5, 264:20, 277:25
vary 162:21, 208:24
vast 98:7, 99:8, 110:17, 287:23
Vegard 101:4
vendors 25:6
ventures 82:5
verbal 148:21
verification 228:8
verified 227:22
verify 170:24, 173:16, 210:12, 240:3
Vermont 114:22
versus 168:1, 175:17, 177:3, 215:7, 227:23, 236:12
veterinary 53:10
viability 64:20
Vice 20:15, 101:5, 101:12, 279:14
vicinity 135:7, 144:23, 145:2, 178:17, 186:4
view 27:21, 66:18, 100:8, 100:13, 113:16, 113:20, 114:4, 116:8, 170:1, 174:11, 241:10, 257:18, 274:8
viewers 95:22
Village 3:26, 13:11, 40:3, 74:17, 74:18
violation 165:2
violence 98:18
Vircon 131:2, 132:3, 132:6, 132:17, 133:17
Virginia 109:24, 109:25
virtual 123:19, 123:22
virtually 75:19, 76:2, 76:9
virus 52:19, 125:5, 125:15, 126:5, 127:3, 130:4
visible 281:6
vision 27:2, 31:11
visit 160:21, 263:22, 276:5
visited 263:15
visitor 9:22, 22:23
vital 286:20
volatile 101:13
volume 26:21, 64:6, 107:21, 114:2, 137:3, 169:7, 185:12, 189:8, 192:1, 280:7
volumes 188:12, 225:25
volumetric 183:22

< W >
W. 3:45
wait 33:25, 49:5, 87:5, 96:17, 242:21
waiting 37:7, 37:24, 37:25
waiving 251:1, 251:2
Waldo 4:42, 99:2, 282:19
walk 59:2, 81:3
walkway 21:10
wall 105:25, 173:19, 181:21
wanted 24:22, 44:3, 74:24, 111:23, 122:23, 124:17, 154:12, 167:16, 173:9, 173:12, 218:4, 245:10
wanting 250:18, 289:4
wants 18:23, 45:1, 168:23, 251:16, 283:18
warm 159:23, 160:10
warming 26:24, 27:5
warning 121:3, 164:7
warranted 250:14
Waste 9:23, 10:18, 10:20, 10:21, 23:11,

32:25, 284:5
wastewater 10:1, 22:14, 22:15, 23:16, 74:21, 76:12, 77:6, 85:8, 236:9, 244:6, 284:7
Watch 3:26, 6:21, 13:11, 40:3, 74:17, 74:23, 76:18, 80:18, 134:16, 255:12, 255:14
watched 33:19
water/fresh 158:13, 229:23
waters 121:2, 194:1, 194:6, 205:11
watershed 117:5, 117:20, 119:14, 119:15, 181:16, 205:16, 212:21, 213:1, 253:7, 256:4, 256:17, 259:5, 259:7, 259:10, 259:11, 259:14, 279:19, 280:20, 281:18, 282:3, 284:24
watersheds 286:5
Wayne 4:5
ways 40:15, 99:5, 116:19, 122:22, 126:22, 156:7, 162:22, 245:20
weak 103:8
weaknesses 230:1
weather 151:22
weathered 144:20, 145:1, 145:4, 195:21
Wednesday 17:24, 18:2
weeds 170:12
week 11:5, 12:6, 109:13
weeks 214:23
weigh 45:1
weight 253:20
welcome 97:5, 105:13, 106:9, 134:25, 204:19, 232:2, 269:25, 288:9
welcomed 25:1
welcomes 78:4
welfare 107:23, 108:19, 151:19
well-founded 280:19
well-intended 273:8
well-suited 170:6
West 4:42, 20:18, 28:24, 137:19, 231:22, 236:19, 237:1, 237:24, 238:7, 238:16, 239:4
westerly 236:17
western 161:6, 231:13
wetland 185:21, 185:24, 186:7, 186:9, 186:17, 186:18, 195:8
wetlands 10:11, 10:12, 32:23, 98:9, 102:22, 120:16, 186:25, 195:10
whatever 99:3, 168:12, 180:20, 183:16, 195:1, 213:23, 250:23, 254:16, 279:10
whatsoever 12:11, 83:24, 250:3, 276:1
whereas 190:9
whether 10:3, 10:25, 54:6, 59:13, 91:4, 97:14, 101:18, 110:19, 151:22, 151:24, 160:14, 167:16, 175:8, 241:13, 254:19, 260:16, 261:11, 268:11, 268:12, 269:14, 270:19, 271:18, 277:20
whoever 240:16
Whole 15:20, 16:21, 28:8, 31:5, 32:14, 63:21, 68:24, 75:12, 85:7, 85:8, 85:9,

88:5, 88:7, 88:10, 88:17, 107:2, 158:16, 174:13, 185:15, 191:23, 192:3, 240:17, 241:7, 255:23, 259:16
wholesome 32:12
wholly 35:18, 50:21
widgets 190:25
wild 25:10, 26:21, 281:1, 281:3
wilderness 106:2
wildlife 98:9, 102:23
willfully 101:9
Williams 264:10, 264:11, 276:3
willing 103:11, 203:3, 218:10
winning 96:4
winter 33:6, 216:23
wish 15:11, 95:10, 96:8, 99:19
wishes 15:9, 87:10, 168:25, 280:13, 282:10
withdraw 149:24, 225:15
withdrawal 117:2, 117:6, 117:12, 118:4, 118:17, 118:20, 120:24, 122:14, 146:17, 148:14, 148:19, 148:21, 148:22, 149:13, 149:14, 197:16, 198:24, 223:24, 238:5, 261:7, 261:8, 261:10
withdrawals 110:9, 225:12, 225:13, 227:4
withdrawing 156:14, 258:25
withdrawn 116:20, 117:11
without 79:9, 84:4, 90:23, 122:14, 123:23, 133:18, 137:17, 152:18, 175:19, 178:24, 201:4, 201:14, 210:1, 221:7
witness 12:3, 13:23, 14:3, 14:18, 49:18, 57:19, 92:17, 95:8, 128:24, 128:25, 157:14, 186:11, 251:11, 255:5
Witnesses 14:5, 14:16, 15:6, 15:22, 19:18, 19:21, 80:7
won 28:3
wonder 159:8, 210:24
wonderful 31:22, 58:1
wondering 87:20, 90:22, 163:6, 271:17
woods 102:22
Woodsum 3:7, 3:16
word 97:8, 138:25
words 50:10, 99:6, 111:11, 142:2, 181:1, 215:8
worked 25:19, 39:11, 63:3, 85:1
worker 96:11, 133:15
working 39:10, 45:4, 55:12, 61:17, 61:19, 71:8, 73:6, 153:16, 196:8
works 101:14, 148:25, 249:6
world 28:14, 28:22, 29:3, 38:8, 40:25, 52:18, 52:21, 53:6, 85:11, 101:24, 126:3, 127:19, 279:24, 281:1, 286:18
worldwide 78:3
worrying 187:15
worst 125:23, 222:5
worth 91:5, 164:21, 227:19, 227:23
wrap 19:22
wrapping 122:7
wrestling 223:1, 223:5
writing 11:3,

13:18, 14:20, 98:2
writings 134:14
written 95:25, 99:14, 99:23, 111:21, 201:24, 259:21, 259:25, 279:12
WRMP 116:4, 143:11, 277:3, 277:7, 277:20
wrote 279:16, 281:8

< X >
XL 101:23, 285:18, 285:22

< Y >
yard 23:4
year 9:19, 26:17, 34:18, 35:2, 45:9, 70:5, 92:6, 110:15, 117:24, 167:8, 167:19, 168:17, 169:19, 176:22, 176:23, 177:4, 193:14, 205:7, 205:17, 213:10, 213:14, 236:1, 236:2, 236:5, 249:12, 264:4, 272:3
year-and-a-half 30:5
yellowfin 159:16, 159:21
yellowtail 29:3, 159:23, 160:7
yes. 80:6, 80:9, 185:9
yesterday 17:2, 18:11
yield 139:3, 188:6, 191:7
yourself 80:12, 106:13, 135:24
Yup 24:13, 79:3, 79:25, 80:1, 216:2, 243:15, 247:18, 264:23, 276:25

< Z >
Zeeland 64:1
zone 21:7, 21:11, 21:14, 145:4, 145:5, 187:12, 244:19
zones 258:18
zoning 21:7