In The Matter Of:

Hudson River Dredging Phase 1

Peer Review Intruductory Session

Public Hearing

February 18, 2010

Martin Deposition Services, Inc.

Malta Commons Business Park

100 Saratoga Village Boulevard

Building 37, Suite 37C

Malta, New York 12020

Original File 02-18-10 Peer Rev. (1)(1).TXT

Min-U-Script® with Word Index

- -

HUDSON RIVER DREDGING PHASE 1

PEER REVIEW INTRODUCTORY SESSION

FEBRUARY 18, 2010

GIDEON PUTNAM, SARATOGA SPRINGS, NEW YORK

- -

PRESENTED BY:

STEPHEN GARON, Ph.D.

SRA International, Inc.

MELINDA HOLLAND,

Facilitator

PANEL MEMBERS:

PAUL FUGLEVAND, Chairman

TODD BRIDGES

VICTOR MAGAR

RICK FOX

PAUL SCHROEDER

GREG HARTMAN

TIM THOMPSON

1 EPA's PRESENTATION ON PRODUCTIVITY
2
3 JOHN MULLIGAN
4 DAVE KING
5 BEN CONETTA
6 ED GARVEY
7
8 GE'S PRESENTATION ON PRODUCTIVITY
9
10 ROBERT GIBSON
11 JOHN HAGGARD
12 ANDREW INGLIS
13 TIM KRUPPENBACHER
14 JOHN CONNOLLY
15 JENNIFER BENAMAN
16
17 Public Comments by:
18
19 TOM BRONSON
20 JOHN JERMANO
21 MANNA JO GREENE
22 TOM KRYZAK
23 WAYNE RICHTER
24 KEVIN FARRAR
25

MS. HOLLAND: Welcome, everyone. We have a slightly thinner crowd today. You are welcome to kind of come up towards the front, be wherever you are comfortable. I hope everybody had a good evening. We are grateful it's not blizzarding. It's easier to get here for you who didn't have to drive. Do all of the mics work? Oh-oh, Victor's doesn't. All right, great.

Greg, we got you a different microphone. I think, hopefully, that one will work for you.

All right, can I see a show of hands how many people weren't here yesterday. Okay, a few folks, because we had a fairly long introduction yesterday and I don't want to make everyone sit through that. I want to make sure I give you what you need to hear.

My name is Melinda Holland. I'm a subcontractor to SRA. Steve Garon here is the Project Manager here from

the SRA for the Peer Review. This is a contractor-run Peer Review. Steve had a long presentation yesterday about all of that. We won't go over all of that again.

If you have questions about what a contractor who runs a Peer Review does or who the contractor is, see Steve on a break or at lunch so we don't have to do that now.

I'm a Professional Facilitator Mediator. I have been doing environmental and Super Fund mediating for more than 20 years, too long. It's good to see all of you. So I will go through the agenda for today. We will start off with our EPA presentation on Productivity, and John Mulligan will lead off.

We will then have a half hour for panel questions to the EPA on Productivity. We will have the GE presentation on Productivity starting off with Bob Gibson and panel questions on the subject. Then we

will have an hour for overall questions for both EPA and GE. Then we will have a one-hour lunch break. Any of the public who would like to speak during our comment period later today, you need to register out front by the lunch period. So we will really know how many we have, how much time each of you will have to speak. So please register for public comment by lunch break. We will have an hour opportunity for public comment, and Steve Garon will give a brief wrap-up about the schedule, and the next steps for the Peer Review process.

I hope all of you who were new today picked up papers from the table out in the front because there is some important information. A key thing, of course, are the Charge Questions that this panel is to consider. I will not read these again, but I want to be sure you have this. The panel is not allowed to consider anything outside of the scope of the Charge

Questions. If you are making public comment, if you talk about things outside of the scope, they will listen to you, but it has no impact. I just wanted you to know that.

We went through the ground rules for the panel and the presenters yesterday. All of those folks are here again today so they don't need to hear them again. Since we have some new audience members, I want to go through ground rules for the public audience folks. First one, there is no active audience participation outside of the times designated for public comment on the agenda. That includes agency staff and contract support. The agenda provides an opportunity for oral comment by the public on the topics within the scope of this Peer Review. You can give a copy of your prepared remarks to Steve or to Alison out front to be included in the record. And we set the public comment up to where you will have a

fair and equal opportunity to make comment within the limited one-hour time span. We will take you in the order in which you sign up and we will divide the time available, and let you know how much time you have. You must pre-register to speak, and I will call on each of you.

You must complete your comments within your time. Please do not address the Peer Review panel outside of your public comment time. You are not allowed to ask questions or ask the panel to answer questions. If you have questions, you just want to put on the record, that's fine but they can't answer them.

We ask you to honor time limits, be concise and be respectful and civil. Please turn off all the noise making gadgets, cell phones, beepers and the like.

Our EPA presenter can come on up and switch your presentation over.

MR. MULLIGAN: Good morning.

Thank you, Melinda.

As Melinda said, my name is John Mulligan. I'm a consultant to EPA. I work on the Hudson River Dredging Team for EPA, and I first became involved in this project in 1974, the spring after the old Ft. Edward Dam was removed. When they pulled it out, they left a water main across the area upstream with the dam hanging like a clothes line across a new channel that was being cut through the mud flaps behind the dam. My firm was engaged to design a new water main. That job grew into designing the dredging, to an emergency dredging project to reopen the canals, because a million yards of material moved downstream in the first spring and filled in the Champlain Canal right up to the brim right at the Ft. Edward Yacht Basin.

We stayed out on the job throughout the seventies, wrote a bunch of reports, proposed dredging and building a landfill in the Town of

Fort Edward. Ultimately, we ended up here with GE doing the work some 30 years later and hauling the material out west.

In any event, I have a long history with the project. I'm pleased to be still in it even though I'm retired for the most part and I'm only doing this job.

I would like to talk to you today about the Productivity standard. In Phase 1 the Productivity Standard called for certain volumes be achieved during this first year of dredging. As the standard was written back in the 2002 and the 2004 time period, we assumed we would have 2.65 million cubic yards of sediment to be removed in both Phases 1 and 2. The Standard called for removal of a target volume of 265,000 cubic yards during the first year, about 10 percent of the total volume to be dredged. It also said the minimum that should be removed during that first year was

200,000 cubic yards to kind of test the system, to make sure we knew what we were doing before we got into a full scale advanced dredging project over the next five years. The standard called for a five-year Phase 2; one year for Phase 1, five year Phase 2, six years of dredging overall.

During the pre-design Sediment Sampling Analysis Program, we had an SSAP program, GE developed a new estimate of what the volume might be in the two phases. They came up with an estimate of about 1.8 million yards, down somewhat from the 2.65 million yards. As a result of the Phase 1 work, of course, we learned that the designed cuts weren't deep enough. There was sediment that had not been discovered during the sampling program that was contaminated. So we went back to the 2.65 million cubic yard estimate as to what would likely be dredged over the

two phases of the project. GE has a very similar numberer, I believe. I think it's important to note, though, that this may be a moving target. We felt we had 1.8, but after we started Phase 1, we are now up to 2.65 million yards, because of the underestimation of the depth of contamination. We expect as we go through Phase 2, we will learn, we will start zeroing in on what the true numberer will be. I good want to imply we have a rigorous scientific or engineering estimate of what this overall volume is. I want to make that clear. That's a guesstimate at this point, 2.65 million cubic yards overall.

During the Phase 1 project, GE actually dredged about -- their estimate is 282,900 yards exclusive of the navigation dredging up above Lock 7.

EPA made their own estimate. We came up with 273,600. We are not clear as to where the difference is.

We believe it's in the frequent of these shore line areas and how it was mapped. For the purpose of this presentation, we will accept GE's number as being close to the truth, because they have a better idea because of their field surveys.

GE also targeted a maximum monthly production rate of 89,000 cubic yards to achieve a dredging rate sufficient for the Phase 2 volumes based on the 2.65 million total volume. They actually only achieved 58,000 cubic yards, so they fell somewhat short of the 89,000 cubic yard target. In Phase 2 the amount that had been left to dredge -- you started with 2.65 million yards, subtract the 280- some-odd thousand yards in Phase 1, and you come up with a number that is 2.3 million and change for the next five years. This translates into a required volume if you dredge the same amount of 475,300 cubic yards a year. The way the

Standard was written, we suggested that they target a higher dredging rate in the initial year so when they reached the final year, they could close it out a little earlier in the year, at least provide them with a cushion in case the volume ran over. The target volume would be about 528,100 cubic yards a year for the first four years, and 264,000 for the last year.

Now, we also understand the design for the systems. When Phase 2 was designed, they won't shoot for the numbers exactly. They won't just say 475,000 cubic yards a year for four years. This doesn't work that way. The geology of the river, the difficulty of getting into the landlocked sections, and other problems will require them to do less in one year and more in another year just depending on the ease of the dredging; they don't know what they're going to run into. But these are good

numbers to use to shoot for if you're going to get this job done in five years. To do a 375,000 cubic yards per year for the project, you will have to get a daily rate of about 3,378 cubic yards. To get 528,000 cubic yards, you will have to get a daily rate of 3,700 and change per day. The monthly rate that will be required will be about 86,500 cubic yards a month. Still, that is less than the 89,000 they targeted in Phase 1, but, again, they did only about 78,000 yards in Phase 1 in a month.

For that target volume, you have to go up to 96,000 cubic yards a month. Those numbers are based on a six day a week dredging project, which is what they did for most of Phase 1. The last few weeks I think they dredged on Sundays, as well, because they were running out of time and had to get off the river. For the most part, they like to do this six-day-a-week dredging. The dredging

season is five and a half months. I think that is down about a month from what was originally proposed in the Productive Standard, which we wrote back in 2002.

For dredging equipment for the majority of the dredging season, GE had the following dredgers:

They had five 5-yard dredging buckets called CAT-385 Excavators, they had one 2-yard bucket on a CAT-345, they had six smaller dredges of one-yard buckets on CAT-320 excavators. They actually had a few other machines out there, but this is what was primarily there for the season.

One of the five-yard dredgers was used to transfer the material from the mini-hopper scows to the large hopper scows, so they wouldn't be running the smaller scows up through the locks.

For scows they started with about 20 large hopper scows. These

things are about 195 feet long by 35 feet wide by 12 feet deep. They started with, ran about 7 mini-hopper scows and started with 7 mini-hopper scows. These things were about 26 feet long by 18 1/2 feet wide and 2 feet deep. And they had initially one super mini-hopper scow, which were actually two mini-hoppers attached end-to-end, and they just left it that way.

Under GE's report -- first, the remedial action work plan as scheduled by the contractor for GE called for larger mini-hopper scows. They were going to be almost twice that size. What was actually used was the smaller sizes. I think the report says they were 3'9" high -- the measurements were different. These are pretty much the right dimensions.

For tugs, they had 13 600-horsepower tugs, 4400 horsepower tugs, and they had three or four utility tugs, using carpenter

(inaudible)they're called. They were boats used to move the many hopper scows around.

This is a picture of one of the smaller dredges, a one-yard dredge bucket on the 320 CAT along with one of the mini-hopper scows. You could see the tires hanging over the sides. These were just conventional car tires. There were walls two feet high. It's a steel beam around that scow, basically the bases are less than a foot.

This is a picture of one of the large hopper scows. They ran these scows where ever they could, where ever the draft was deep enough. All of the material transported was transported in these scows, not the mini-hopper scows.

A number of factors affected the dredging rate in Phase 1. Perhaps the largest one really, the tail that wagged the dog as far as maintaining high productivity is concerned, was

that scows were unavailable to the dredgers for many hours because of the inability to unload the scows at the same rate they could be filled by the dredges. Another issue was the presence of slab wood and debris. I will talk to each of these individually as I go through this talk.

The mini-scows had relatively limited capacity. There was an underestimation of the depth of contamination requiring many passes, and there was fine grading to meet very tight cut lines.

I would like to speak about the scow unloading issue. This is a picture of a trommel screen, the blue device. This is an excavator, got a five-yard bucket on it. The scow being unloaded is on the back of the excavator. You can't see it, because it's in the canal. The top of the scow wall is below grade. In the operation of this system, the

excavator, we retrieve a bucketful of material out of the scow, put it here. This is a twelve-inch grizzly screen. Now, that screen is mounted over a box, similar to the dump box on a dump truck, a 10-yard box. They drop this material from the scow into the screens, the grizzly. Whatever went through fell into the boxes. The grizzly was pitted upward vertically to the right clock-wise. The grizzly would pick up vertically. The dump box under it would then pivot, and tip up in the other direction and dump the load into the trowel. The cycle time was one cycle per minute from dumping the grizzly, and dumping the scow box into the trommel. They were not loading directly into the trommel.

This bucket requires a 20-inch depth of cut to fill it. It's a five-yard bucket. If you had 21 inches or more of material in a scow, you could fill the bucket with one bite.

The design of this thing, the manufacturer's rated capacity is about bucket every minute. Actually, the manufacturer says a 50 minute hour, a 45 second cycle time.

They're using a bucket a minute for a round figure, because that is the cycle time for this trommel operation. You should come up with 300 -- 5 yards times 60 minutes, that's 300 yards an hour. Knocking it down to 50 an hour, giving the operator time for a break, you get 250 yards an hour.

Now, this operation went seven days a week, about 250 yards an hour, even if you used a 20-hour day to make shift changes and down time for equipment and refueling, you would be able to do 5000 yards a day of unloading. The fact of the matter is, it could never achieve that.

The big problem from my point of view -- and I think GE would agree -- if a scow comes in here and it has 5'7

in it, you can fill that bucket and get about 5 yards in a cycle. As the sediment level of the scow drops down to 14 or 15 inches, a foot, you are filling the bucket about half way. The upshot is on average, they are only getting about 100 yards an hour out of that machine.

They had two processes. When a scow came in loaded, the first thing they did was pump out the water with a 2250 gallon pump. They get most of the free water out, but, of course, need a foot and a half or so of water depth around the pump intake to prevent vortex, and you were always left with some water. If the material in the scow was well drained, you could unload it directly into off-load dump trucks and haul it off into the storage area. If it wasn't well drained, it was mud, silt, clays, what-have-you, you had to run it through the trommel to separate the water and larger material out, get the

clay and the silt and other pines over to your filter presses ultimately.

So to get back, because of the strain on the scow, it couldn't keep up with the amount of the dredge material coming in. The max unloaded by this machine was 17-18,000 yards in a week. The average volume required for Phase 2 is about 22,000 cubic yards a week. You will have weeks when you have more dredging than others, because this is the way things work. You want to be able to handle more than your average, so you can handle the peak days. I think the max volume required in Phase 2 will be probably around 25,000 cubic yards a week for unloading. Clearly, you got to increase the capacity on the unloading system, whether to add an additional one, change the design, something has to be done.

Now let's talk about dredge operation time. We had 12 dredgers, 11 working most of the time sitting on

the river. We had 12 available. The dredges worked six days a week. They dredged about 165 days a season. If you subtract Sundays, where no dredging was done, you are down to 144 days, round figures about 140 days amount of time you could have been dredging. Excluding a few holidays, you may have had other problems, but the dredges were there 24 hours a day, but you had about 30,000 hours, probably 35,000 hours if you start saying, well, you have six days a week, times 140 days, 24 hours a day you have 40,000 hours of dredging equipment sitting here. But it was not always usable. You have to have time to move the dredges around, you have breakdowns, fueling, shift changes. So when you come right down to it, the effective time dredges were loaded up, staffed, sitting on the river ready to dredge, GE estimates they had about 18,125 hours total dredge time. That's the whole dredge

fleet, whatever was available.

Now, during the whole season they lost 382 hours to storms and fog. Lightening storms would typically shut down dredging operations. Fog was a problem for at least a couple of days for a few hours.

This, by the way, is numbers, the Weekly Summary Report prepared by GE each week when they talked about how many dredges were available for the week, how many hours of dredging was done, how many yards of material was moved and they also summarized on the back of that report any delays that occurred, problems that had to be overcome.

A copy of the last summary report, the running report, the last report that I used was dated November 4th. It's in with the EPA Design Analysis Report for Phase 1. It provides a list of lost time. It covers the storm/fog information.

Resuspension. About 6 percent

of the 18,000 hours were lost because of job was shut down because PCB concentration on Rogers Island exceeded 500 nanograms per liter. High flows, particularly in the West Channel of Rogers Island, the flows, the velocities were causing problems maneuvering large scows, moving mini-scows. So they reduced the criteria for which flow they could dredge down to 7,000 cubic feet a second. For awhile it was 10,000 in the program. That cost them some time. They lost about 1,090 hours.

MS. HOLLAND: Tim, do you have a question?

MR. THOMPSON: I do. I would like to explore this just a little bit. To be clear, the total available hours of 18,000, is that total workday hours?

MR. MULLIGAN: These are hours that a dredger was actually on the river staffed up, ready to work. It excludes from the 40,000 total hours

he could have dredged for any time he had to move it upriver to down-river.

MS. HOLLAND: John, hold the mic up closer. Thanks.

MR. MULLIGAN: In any event, high flows cost them about a 1,000 hours. The biggest loss of time item, was the dredges that sat around. After they sent a loaded scow away, they would have to sit and wait for the scow to come back.

MR. THOMPSON: I didn't hear the answer I was looking for. I have to interrupt you; excuse me for that. I think you said it does or not include the time they were on the dredge barge and the time involving moving the barge, repositioning the barge?

MR. MULLIGAN: Those were taken out as ineffective hours.

MR. THOMPSON: These were 1,800 that --

MR. MULLIGAN: That you didn't have a scow or your were told to stop due to resuspension and (inaudible).

MS. HOLLAND: John, you need to hold the mic closer. We can't hear you.

MR. MULLIGAN: 18,000 total available, yes.

MR. THOMPSON: 18,000 total available? There were crew is on --

MR. MULLIGAN: The crew was on, it was gassed up, you were off the lunch break, you were ready to dredge.

MR. THOMPSON: You were ready to dredge?

MR. MULLIGAN: You were sitting there trying to dredge. Theoretically, this shut-down for the dredge is 18,000 hours.

MR. THOMPSON: Okay. I think I will wait for GE to answer. All right, thank you.

MS. HOLLAND: Greg?

MR. HARTMAN: The effective time, are these hours here, these are the hours waiting for the barge, no scow; was that considered not the effective time and dredging was

effective time. I don't see an effective time.

MR. MULLIGAN: I didn't give you an effective time. GE has details that are quite extensive in the report. They will tell you what was lost for shift changes and at the beginning of the shift, and so on. They came up with a number of 18,125 hours of time when you presumably could have been digging, not moving the dredge from site to site, not flipping the barge or moving the dredger, or off for lunch, whatever. It's when they should have been digging.

MR. HARTMAN: Okay, thanks.

MR. MULLIGAN: In any event, when you are tracking the lost time, you are down to 10,878 hours where they actually dug sediment.

I should mention in GE's Weekly Productivity Report, they listed another lost time issue, lost delay issue, and that's when they were

digging clay.

The river bottom has in many areas, has a consistent clustering clay area that's very thick. It's native soils. If you get into it, what you are digging out pure Albany, Lake Albany clay. It's a loose, wet clay. It comes out looking like was boulders in the dredge buckets, big chunks. You really don't want to dredge that. If you give the dredger a cut line and say go to this line, and your two sample cores are used to drill that line 80 feet apart, the clay comes up between the cores, you do a straight line, the clay comes up in a hump, you don't want to get into it. When that would happen, they would slow right down. They would try to follow the top of the clay as best they could, so they wouldn't be removing the clay.

The clay created a lot of problems in the off loading. The balls were rejected, went through the

trommel screen as rejects, and/or got hung up on the grizzly, and it wouldn't go through that. Downstream the processors, the clay fouled up the thickener tanks, slowed down the cycle time on the filter presses. You can read about this in GE's report or our report. They created a problem. They don't have an effective way yet to deal with clay if they get into it. And they certainly will have some of this in Phase 2.

It became a big problem in Phase 1. They started getting into a clay layer and that kind of slowed things down for them. I know there was lost time, because they were dredging; it's not lost time. But some of that problem probably resulted in not having available scows, because you had six or seven scows at the unloading site. They were figuring out what to do with them. They were showing time lost because you didn't have an empty scow.

Average dredging rates. They had a few dredgers, of course, and they were generally digging, dredging about four of the five yard dredges. If you take the 10,078 hours of actual digging time, you come up with after subtracting the lost time from the time, you could have been digging. You divide it by the amount of time dredged by the five yard dredgers, you find they dredged 46.7 yards per hour, on the average, not a very high rate. The three-yard dredge did about 24.7 yards an hour on average, and the one-yard dredge did about 15.6 yards on average, per hour.

Now, if you go back and divide them out, it was dredged by 5-yard dredges by 18,000 hours, you come up with, for the time that dredge sat there ready to work -- although you might not have had the scow, you might have been shut down because of high flows -- you find out you only accomplished 18.28 yards per hour with

a five-yard dredge based on a total available times dredged. I think the numbers you really want to look at is the 46.7 and 24.7 and 15.6 for the whole fleet, the total number of hours you dredged with your fleet of dredges, divided into the total amount you dredged in Phase 1, you come up with 26 cubic yards an hour. So that's what they averaged per dredge.

MR. BRIDGES: John?

MR. MULLIGAN: Yes.

MR. BRIDGES: Can you describe how buckets of different sizes were allocated? I mean, what went into that process of determining where to use buckets of different sizes?

MR. MULLIGAN: GE will give you a better answer than I can, but I will tell you when can get a big scow into the system, you would use the five yard buckets. If you had deep cuts, you use five yard bucket. If you wanted to dig out six feet, you'd use a big bucket.

They had a lot of areas, particularly the West Channel of Rogers Island where the available draft was only 3 feet. You couldn't get the 385 scow on that barge because the dredge -- it's a heavy machine and you had to use a smaller dredge, either one of the 320's with a one-yard bucket and also had to use the mini-scows.

Now, the mini-scows, you use the five-yard bucket, you fill it up with five or six bucket and you were done. So you use the mini-scows for small dredges and the big scows for the large ones. Where possible, you use the big scow with a smaller dredge if you had one available.

You always had to keep one large scow available at the sediment transfer location down at the south end of Rogers Island so you could service the mini-scows that were coming down from the small dredges. You had six of those babies working,

and if you didn't have a place to transfer the material out of these mini-scows, all systems shut down. You prioritize the transfer station. You keep a scow there and as soon as the scow is filled, you get an empty back. That may mean somebody else didn't get a big scow, but you got to keep that operation going, or you shut down six dredges.

MR. BRIDGES: Okay.

MR. MULLIGAN: Going back to this unloading issue, this target reduction rate of 89,000 a month, again, the accurate production number was 78,300 to 78,600 or something, and we rounded it off to 78,000.

Time lost awaiting empty scows, max production occurred I believe between July 7th and August 5th, a 30-day and 15-hour month that GE used. In any event, during that same time period when they hit the maximum, they lost, according to the Weekly Productivity Summary Reports, 1400

hours waiting for empty scows at the various dredges. So you see if you had scows available for that 1400 hours and you could have kept the dredge working instead of sitting around three or four hours waiting for the empties to show up, you only did 26 yards an hour, because I don't know where would have been, you know, whether it was a scow being serviced by a one-yard dredge or a five-yard dredge. But if you use a 26 cubic yard per average, theoretically you could have dredged another 36,000 cubic yards in that 1400 hours than what they actually dredged, which was 114,000 yards. That is way above the 89,000 yards you targeted. It's above the maximum monthly amount you need for Phase 2 under the higher dredging scenario where you dredge for more years. I think this shows that you could -- the dredging equipment was adequate to meet the Productivity Standard. It was an unloading issue,

among others, that killed productivity.

The second factor on the list that I gave you things that delayed dredging was the presence of debris in the water. This started with buckets coming out of the river filled with sticks. You can't get the bucket closed. They were filling a mini-scow at this time and the dredger would reach down, tried to close the bucket, he wanted to close it, but the console said the bucket was closed before he filled it up. With all these sticks, he couldn't close it. It's hydraulically operated, but you couldn't sheer those sticks off and crush them; there were just too many of them. So the dredger might make two or three attempts to close the bucket before he lifted it off the bottom. Because each time you open and close it, you are causing more resuspension, presumably. So, ultimately, you're pick it up and dump

it in that scow.

Next slide, please. Here is a picture of -- it's not unusual as to what came out of the river. See all the junk in that mud? When you got that, you will have problems closing buckets and getting a full scow.

The other thing I want to talk to you about while this picture is up is these mini-scows with these two foot walls, had a neat capacity. If you filled them just level to the tops of the walls, it was about 35 yards. You can mound them up in the middle as the picture shows, but you could not have more than about a foot of water around the outside edges as in here in the scow. Because if you did when you went to move it to the transfer station, the water would slop over the sides. So they ended up maintaining a foot of freeboard here to hold water. The upshot of that was that most of these scows probably only carried about 25 yards of sediment, and it was

a half hour trip or so from CU-5 or 6 in the West Channel of Rogers Island down to the transfer station. The scow was taken away. You wouldn't get an empty back for an hour, hour and a half, and the dredger's log would say hour and a half down time waiting for the scow to come back.

These could have been bigger. In fact, the super mini-scows, which are 52 feet long, could carry 50, over 60 yards. You wouldn't wait as long for the scow to come back. It would take longer time to unload once you got to the transfer station, but that time is probably minimal compared to the travel time coming back. Unfortunately, with a 52-foot long mini-scows, the drift arm, the arm on the dredge machine couldn't put the material in the scow evenly. They had to move the scow ahead at least once each time, because you don't want the material on one end. It would become unstable. So there's no really neat

fix or clean fix. They had to have more mini-scows.

Another major factor in the dredging production was the impacts of understated final design line, cut line, and also the fine grading that went along with that.

How much more time do I have?

MS. HOLLAND: Half hour.

MR. MULLIGAN: Underestimating VOC, as you heard yesterday, created a need for additional passes over the CU's, usually three to four passes, and one time five passes, to get it to grade to a clean sediment layer. They lost time in mapping, sampling, and getting lab results back, deciding what to do for the next pass. They kept the CU open for a longer period of time. At the end of each of these passes, the dredger would try to hit his dredging target, plus or minus three inches on a 10 foot by 10 foot grid. He did a little surgical dredging for a few days trying to hit

the line before he notified GE he was ready, he was at his cut line and they should map it and, of course, it reduced production rates. All of this kept the CU open longer and introduced resuspension.

CU-1 was an anomaly. They were designed for 13,000 cubic yards and ended up taking out 49,000 yards. It was an anomaly as to that point of view. CU-1 was at the yacht basin in Fort Edward. In 1974 and again in '76 it was dredged to a depth of 14 feet and it refilled to about six feet or five feet by the time the dredging, Phase 1 Dredging Project started. Nevertheless, the refill, presumably, was all contaminated material that washed downstream from the Old Fort Edward Dam. But the initial cut line shown by the sediment sample analysis had us take out two-and-a-half feet, which is what they did, and, of course, they sampled and they found they had to take out more. They did,

and sampled again, and had to take out more. Ultimately, at the very end of the job, they did two tests and found out what was left, found out at the bottom we hit native soils down there around elevation 100 when they started at elevation of 111 and 112. They had to go down 12 feet overall to get all the way to the bottom. They might have anticipated knowing that they had dredged in '76, and anything that came in after that would be contaminated, still would be contaminated, but for whatever reason, it wasn't.

I would like to walk you day by day through CU-1. Recognizing this is not probably, you know, a typical dredge, but it will show you what I have been trying to talk about.

The first dredge pass in CU-1 began around June 1st, and it continued through until about July 13th. They took out their targeted sample of about 13,000 yards.

Now, what this slide shows,

among other things, earlier in the week, you start out with -- by the way, they used a five-beyond dredger initially at this site with a large scow. The large scow was, I guess, hindered in what it could do, because just south of this site, there was a shallow spot in the navigation channel with only a four foot of draft. Even though you're using a scow that could handle an 11 foot draft overall, you have to get it over the shallow spot. So they were only they filling the scows to a three foot draft. It was about a 45-minute transfer time to this scow down towards Lock 7 before they bring it back up. Once you put three foot of draft in this scow, you are waiting an hour and a half for an empty to come back with an empty scow to continue filling.

GE decided not to deepen that piece channel to allow a deeper scow in to get material in and out. They thought, well, let's try this, see how

it works. They dredged, beginning of the week started out 600 or 700 yards in a day. This is daily production. Most of these things show a decline over the week. Well, that's the result of being able to start out the week with a bunch of empty scows sitting around, because you have the empty scows on Sunday when you didn't dredge, but about Thursday, you have seven or eight scows loaded with sediment backed up at the unloading dock waiting to be unloaded, and the number of available empty scows was falling off. So you see this pattern of relatively high production rates in the beginning of the week and dropping off by the end of the week and, of course, as the dredger approached the final cut line in the last three or four days, he wanted to be sure he was right at target on this dredge cut line, plus or minus three inches. The dredge was surgical dredging. We wrote the performance standard and we

anticipate the GE would be able to cut immediately to the cut line. The technology is there, they did a good job. I'm not in favor of surgical dredging. If you spend three or four days getting a three acre CU to where everything is at grade, or within three inches of grade, and find out it's in the wrong spot, you have to do this all over again. This happened at the end of this dredge pass. At the end of the first pass through this CU -- I will use the term "initial inventory dredging" -- we used to use dredge pass and I didn't like when we started using this term, but now we're stuck with it -- at the end of the first attempt to remove the CU down to grade of the initial cut lines, they sampled, they took a -- well, first, the contractor notified GE that he believed he had achieved his cut lines. GE then ordered OSI out to make a map. They produced a map. They gave a map to Dave King in the

Hudson River Field Office of EPA, and said, here is the map where we were within the three inch plus or minus tolerances, and here are the squares. We are places where we are off a bit, mostly an inch, a quarter inch, an eighth of an inch, but in this 10 by 10 foot square, we think it's close enough. Dave would say he would agree. He would get the map in the morning and go to a meeting at three o'clock in the afternoon, and he would say he agrees, you met your lines, and give us samples. GE didn't have to get Dave's approval for the sample, just acceptance. And then it was, wait a minute, each of the three or four 10 foot squares are too far out of compliance. They would really have to have an agreement with EPA that they have a cut line. Maybe that cost them six or eight hours. They get the sample results back, they looked at it and, at end of the first period of dredging, the samples results came

back and they said, you are pretty close to 1 ppm, but averaged less than six. We think what is left here is a minimal six inch residual layer still back with the dredge bucket with debris in it, we don't have a lot to go, but we'll do a six-inch two residual passes as issued by the original performance standards. So we take out six inches that we think will be there.

So they dredged through this July 13th until after August 10th -- August the 15th or 16th to remove a six inch layer. It was six inches plus or minus three -- well, a six-inch cut, but they didn't get very much production. The average production was somewheres around 100 cubic yards a day with a 5 yard dredge doing this. There were days they were moving around and getting production time off, for whatever reason, no available scows, what have you, they pushed up over a month here with

residual passes.

I am showing you this because there has been discussion that if you really have proof of a six inch residual, do the cut lines right at the 1 ppm level and you dredge it, you are left a few spots that were hot, you probably would have to go back and do a residual pass over at least parts of that CU. And if you do that, you can expect to be in the 50 yard per day to 150 yard per day range for your production. This is the only CU that I have that I could show you where we had a true residual pass that lasted any length of time and covered the entire 244 acres of the particular CU, and that is why I used this slide rather than the other CUs.

Once this residual pass was finished, they went out and collected samples. This time it was up around 10 or 11 on that. So EPA said the requirements are high, you better analyze the full 24-inch board in

six-inch segments. So they go back out, analyze that, come back and say, geez, the bottom of the 24-inch core is still above, all over the place, not in the entire CU, but in most of it.

They then developed a new cut line, gave the dredger a brand new drawing, said you have to get a couple of feet out of here. Here is your new cut line, load this into your dredger and go out and get it done. He starts dredging again. Again, you see generally a drop off in the beginning of the week to the end of the week. There is a week where it increased for whatever reason. There is a gap in here where nothing was happening. I'm not sure why, whether it was a shutdown or storms, whatever. Towards the end of this period, you end with another four or five day stretch, he is doing fine grading to try to fine tune the cut lines and tell GE he is ready. When that happens, they are

into mid-September. GE went out, did a map, got acceptance that everything was right, they had gotten their cut lines. They had a discussion for a week that said what will we do here? We are not at the bottom yet, we are running out of time. At that point GE said, you know, we're sending these scows out here with three foot of draft, and that's not helping a bit. Why don't we dredge out the high spot in the channel, so they did something. They accessed the dredging right here (indicating), two days they took out about 1500 yards of sediment, got it out of the navigational channel -- not sediment targeted for dredging. So they dug it out so they could get out of here with a fairly well-loaded scow.

Now, they come back, they are rushing, because they are at the end of the season. They get up to 1400 yards per day and actually got a second dredge in here for part of

this.

MS. HOLLAND: John? (Indicating the time left.)

MR. MULLIGAN: Okay.

When they finished that pass, they, while they were finishing it, they started sampling subsets of the CU. They didn't want to get to the end and fine grade it and sample and make a map, so they sampled it in advance. And they did one more pass, and did this patch. They shut down for the fall. They didn't get down to the bottom where there was high concentration of PCBs.

Next slide. So kind of in summary, I believe if they had enough dredges on site, enough scows on site, you could meet the Phase 2 productivity requirements as far as production goes if you figure out a way to best address the uncertainty in the depth of contamination so you don't have the start-stop, start-stop efforts where you go back of the same

five acres to define a new cut line.

You must improve the scow unloading or you will be plagued throughout the project. You should minimize the fine grading at the end of the first pass to get to the tolerances specified. It's fine for the last pass, but in the first passes you spend three or four days removing spuds and things from a dredge scows, some little hump where you've got six inches high, and you are not getting production, you are moving all over the five acre CU to address the 10 blocks here, there, and everywhere, and you're not getting anything accomplished.

Sample first. If you have to take out a draw a line two feet lower, at least you didn't waste your time; you can do that.

Conduct access dredging where you need to. It would have been better -- and I think GE would agree in hindsight -- had they dredged out

the shallow spot in the canal in CU-1, they would've been better off.

I would like to turn this over now to Dave King to make a couple of closing remarks before you guys start the questions.

MR. KING: Thanks, John.

I don't have any slides -- I will spare you that. This is the end of the presentation that EPA's making over these two days, and I have some brief observations of what I have seen. We have covered a lot of ground in two days, no question about it. There are huge boards and tons of data we were looking at. We looked at some things in fine detail and look at things as gross generalizations. This is the nature of this kind of a process right now, but we sort of look at the Engineering Performance Standards as a backdrop or context to be set. So we can look at a lot of these items we have been discussing in detail and design, because that is how

we will solve the issues in the design for Phase 2.

We will deal with operational changes, procedural changes, some structural changes, perhaps, when it comes to the scow unloading. But that is where we will resolve a lot of these.

But I have seen in our discussions, there is a lot of common ground here. We all want to reduce the number of dredge passes to get the inventory out of the river for a host of reasons, resuspension, getting down to proper residuals, et cetera. We want to reduce the time it takes between dredge passes, to review this to look at the data, and that has eaten up a lot of time. We need to reduce that, like we need to reduce the time it takes for the CU approval process. We need to use the dredges and all the equipment out there effectively and efficiently.

As John said, there is plenty of

equipment out there. That wasn't the issue. It's how effectively we can use it. We all want to reduce the resuspension from our operations in the river. We want to limit the time for Phase 2, five years, and while it's not part of the Engineering Performance Standards as Ed and Joe pointed out the other day, we need to do the work we're invariably doing. So while our approach to these items may differ significantly, in some cases if we had the right backdrop in adjusting standards, we can work out the details in the design, and I think we can get to an effective Phase 2 design.

Phase 1 showed us the conditions that we were going to run into in Phase 2. There is a lot of bedrock, a lot of clay. We will have to deal with that in design and procedures to make sure we can handle that effectively. Like any other project of their size, we are going to come up

with things totally unexpected. Murphy and his laws are in full effect when it comes to this.

Bob Gibson from GE always calls this "Hudson luck." If things were going great, things would drop on us, and it's, like, here we go again. That is the nature of construction, the fun of construction, that you have to deal with this on a daily basis. We did and we will continue to do that. At the end of each year, we will sit down and do what we need to just to keep improving the operations. Again, that is the nature of a project of this size.

The details of our position and details of GE's position are in the reports. Once the reports are final, you will get a chance to dig into them in detail. We look forward to sitting down with you in May when we come back for the three days. That will be a different discussion for sure.

Again, on behalf of EPA, we

would like to thank you for participating in this process.

MS. HOLLAND: Thank you. Now we have an opportunity for questions on Productivity. We have up until 9:45 if you guys want to take that time. Okay, Paul, then Rick.

MR. FUGLEVAND: I have a couple of questions. The first is on the Performance Standard, one month production. Could you explain to me what is actually stated in that Performance Standard and what is, what is the explicit requirement? Is it 89,000 cubic yards a month? Was it written as, let's see if we can do it, or was it written as an absolute? Can anybody quote the Performance Standards.

MR. MULLIGAN: Let me take a shot at it. I haven't re-read this since I wrote it eight years ago.

The thrust was during Phase 1, you should demonstrate your dredging plan, your dredges and de-watering

system, the whole system you set up to do this job can work at what rate for 30 days, a 30-consecutive-day period, then demonstrate you could meet the Productivity requirements of Phase 2. If you are trying to dredge 47,000 yards as required each year in Phase 2, you are to take that, divide that up to so many months and come up with a monthly rate. The original Performance Standard, I believe, envisioned about six and a half months of dredging. We had a number around 77- or 78,000 yards -- it's all in there. When GE said, well, we are designed for five and a half months' dredging season. You have to bump that up. You have to dredge more each month. They produced the 89,000 yard number.

I don't look at it as an absolute. It's a test of your equipment and plant. You didn't meet it primarily because you could not unload scows consistently at a rate

that would allow you to keep the dredges working.

MR. FUGLEVAND: The place I'm not clear on, I'm used to Performance Standards that say this is something you need to meet. If you don't, it then has a consequence.

I'm real confused because on one hand I hear people talking about an absolute that there was a Performance Standard, and part of what we are reviewing is the performance standards and did they meet it? And what we see is that they didn't.

I'm not hearing anybody say that there was a Performance Standard. I'm hearing people say, well, here is the reasons why not. Seems to me, if you just read the sentence, they didn't meet it.

MR. MULLIGAN: That's right.

MR. FUGLEVAND: Did the Performance Standards ask they do a detailed evaluation to see if they bought enough scows, or can they do

it? I hear a lot of discussion of throwing stones almost. It almost seems like they are backing away from the Performance Standards. Was it a standard or not?

MR. MULLIGAN: The standards have demonstrated your plan, overall plan, dredging, unloading, and processing can work at a rate sufficient to complete Phase 2. We had to prove this over a 30 day period. It was a test of the system.

MR. FUGLEVAND: So didn't they prove, didn't the project demonstrate they cannot achieve that?

MR. MULLIGAN: Yes, given the conditions of the design at present.

MR. FUGLEVAND: I don't think that's what the Performance Standard said. Doesn't -- it sounds to me like they didn't meet the standard, and I think they are making a case that from a productive, productivity perspective, maybe there is too high of an expectation on a production

rate. And I think that rather than hearing everybody throwing stones about "they could'a, should'a," I thought the standard said "demonstrate," and if they gave it a good effort and couldn't meet that, I think it has a different implication -- again, to me this was like a public whipping of GE. I don't think that was appropriate from what I know of environmental dredging. I think it's realistic to have an expectation of productivity and it wasn't met, I think that needs to be considered.

MR. MULLIGAN: Well, let's back up. You are saying is this a true performance standard as written into a contract as demonstrated X number of gallons a minute?

I think at the time we wrote it, it probably was, but there is no penalty. There is nothing in the Performance Standard that says if you don't meet this, we will fine you.

None of that. I personally, and I know EPA, has not thrown stones at GE because they couldn't meet 89,000 yards a month. But the purpose of Phase 1 from our point of view, it was to show you that you either could do it, or you couldn't do it. Now, if you couldn't do it, it was impossible, and with your best effort you couldn't do it, there's nothing you can do to change things, maybe we should change it to, say, you need six years for Phase 2.

I didn't see that. I saw you didn't meet it, but another unloader would've taken care of the operation. You got probably one dredge coming here, probably dredging in 2011, you have all summer to get another unloader up here to work on the dock to get this taken care of.

There are other issues out there as well. You may want to go out to where you have cores that are incomplete, and push a few different

sample tubes down there and see if you can re-define the line a bit. There are a number of things can you do to help you out in the first year of Phase 2. You will probably learn more then and maybe decide to make other changes.

But there is no intention here to throw stones at GE for not hitting the original 89,000 number. The original standard I think was 78,000 and they hit it. There's no penalty.

MR. FUGLEVAND: So my second question is, we heard lots of discussions about lots of surprises unanticipated conditions and changes that need to be made. One change I heard everybody talk about is five years. Five years seems to be cast in stone, but it doesn't seem to necessarily be kind of to match the site conditions. Is the five year thing a number in the ROD or is it a number that is administrative? What is the basis of the five years?

MR. MULLIGAN: Would you object if I turn it over to EPA? I would rather have Dave answer that.

MR. KING: If we look at the total project of the six years, including the first year of dredging, that number really gets back to the whole discussion of a bottle of -- you know, the quicker you get it done, the shorter the impact would be on fish, because that is the main risk issue associated with the PCBs in the river right now. So I think that is really where this came from.

Since then I think the idea -- and GE has said it, we said it -- we would like to finish Phase 2 within five years.

Because of that and also because that's an expectation out there now with the public also. We want to get this thing done as soon as we can to do it, effectively.

If we can hold it to five years, that would be great. If it turns out

through all of the things that it takes an extra year, it will take an extra year. That is still our targeted objective, to get it done in five years.

MR. FUGLEVAND: Again, so I understand, there was an understanding that when the ROD was written on what we thought we could do, and now there's been a tremendous amount in Phase 1, it seems to me revisiting the five years from the perspective of how long it would take to do it quickly but well, and I think that's one of the things that would be worth considering, because yesterday the five years has always seemed like it's cast in stone and arbitrarily cast in stone.

MR. KING: It's not certain. It's something that has to be looked at. But if we can do it in five years, we would like to accomplish that.

MR. FUGLEVAND: I have one other

final question. We heard a lot of discussions from EPA saying, "Here is what GE could do to improve."

I'm curious to hear what EPA could do in the next five years to improve productivity and performance standards, and not kind of say what GE could do. I'm curious what your thoughts are in that regard.

MR. KING: Yes, I think that is an interesting perspective. We touched on it several times that we need to streamline the approval process. I mean, we need to make sure that we can look at the data along with GE collectively so we can reduce that time in between the dredge passes. I think that is one thing we can do to get that done.

In the field we worked a lot together on a daily basis trying to address issues, and I think that it's incumbent upon the EPA to do that. I think that is why we had a significant team in the field working with the GE

team to -- you know, this is something we have to get done collectively. We need to focus more on that and we will. We haven't specifically laid it down in the standard, but that's a good take away from this discussion.

MS. HOLLAND: Rick and Greg and Todd.

MR. FOX: Switch to the last slide. I'm following up with Paul's question.

John, you talked about minimizing fine grading. What specifically are you proposing here? Are you talking about relaxing a standard for GE to meet in order to get to the sampling phase, or are you talking about over-dredging? I don't really understand what the recommendation is here.

MR. MULLIGAN: I haven't made a firm recommendation here. I made a report on Phase 1 and what I suggested. This is not a firm, hard recommendation. I'm open to

suggestion from anybody, that before you spend three or four days a week trying to remove the lifts off the bottom making sure you met your final grade before you get your samples, it may very well be when the samples come back, you will have to re-draw the line and all that time will be wasted.

I think that's a procedure that doesn't impact the standard, as written. You might want to change the flow sheets in the standard site, start sampling the sub-sections of the CU while you get them close to grade. This is probably as much of a contracting problem with GE as it is for EPA to administer the thing and watch it. Because if they start sampling before they finish dredging the CU, they could foul up the operation in the area, that this is something that GE will have to consider. Toward the end of the project they started doing this. They would go into a five area CU and say

we are down here and grab the samples on the upper end to make sure that's correct.

MR. FOX: It's almost like we talking about very small amounts of material, picking fly crap out of a pepper shaker. To me, perhaps it could go to a percentage of compliance on a CU basis, or something like that, because what I would submit if we went right to the verification samples and we passed, why should we go after the humps.

MR. MULLIGAN: We probably would put the backfill over it. Because we want to know what we have before we put the backfill down.

MR. FOX: So you are saying those little humps don't matter. There should be a consideration of what does matter, and reset the standard that way.

MR. MULLIGAN: What does matter is if you do a sample and it's below 1 and it comes back that half of these

samples are below 1 and half of the samples are 15 or 20, the hump didn't matter either because you're probably going to end up having to test two or three feet of where the samples are high and you waste your time.

MR. CONETTA: We are talking about fine grading and the Standard. Fine grading is not part of the standard, it's part of the spec.

What we are trying to say is we learned some things from Phase 1. These are one of the things we need to look at and try to address.

MR. FOX: Right, and the fine grading is so they can meet --

MR. CONETTA: The cut back.

MR. FOX: Right, so they meet what you guys require in order to get to the point where they can get a verification sample.

MR. CONETTA: Yes.

MR. FOX: Perhaps there is another way you can look at that to its completion.

MR. CONETTA: It is looked at in terms of a CU basis on a 10 feet by 10 feet grid, plus or minus tolerances.

MR. FOX: But all of them have to be on --

MR. CONETTA: No, no. You have to be more below than above. The sample has to be negative. So what we've learned from Phase 1, the DOC has obviously been underestimated. There is not much point in doing that. Why do fine grade when you still are looking at the inventory?

MR. FOX: I think you have to look at the standard, though. While we have the DOC close, is it still worth the fine grading?

MR. CONETTA: It's a good point. Some will be design issues more than standard issues. I think we fully acknowledge that. To us, a fine cut line has proved problematic. How do we address that? That is the next step. That is what we have to work together on and find out. There are

two issues to this; there is areas that seem to be well-defined cores. We have different ideas on that and some that we don't. It's a complex system out there. It involves working together with GE on that.

MR. FOX: One more question. On the first bullet, I think we were dancing around a bit on what the specific recommendations are to get a better DOC.

We talked about it yesterday on the Residual Standards. Does EPA have a firm recommendation? Are they talking about sampling in the low confidence areas?

MR. CONETTA: We have a couple of recommendations in there. Our report is still getting fine tuned. There were questions yesterday and today that we will try to address. We will try to give you a road map as far as where we are going with the data, how we will evaluate it. In terms of do we have a recommendation, we do for

complete cores. Incomplete cores, we can do something, as well. They can range from 20 inches to who knows how deep? If it's in a debris field, you need to dig through it. You take samples at the bottom at the end of the day. The debris fields are full of PCBs. Do we recommend sampling? There are targeted areas where you have incomplete cores, the sampling may make sense. John may have mentioned this. If there is an uncertainty with the DOC, I'm not sure you will get a better DOC with sampling equipment.

We need to address the uncertainty. There will be a process with EPA and GE and, hopefully, we will come to an understanding on that.

MR. FOX: We should try to tend toward proactive rather than reactive especially in the low confidence areas to try to get some better data. It's not possible, I understand that, over-dredging -- just a blind

over-dredging to me, doesn't make sense.

MR. CONETTA: We made the conscious decision not to do a blind over-dredging. I don't even understand it, because I wasn't involved in it. But over-dredging in and of itself, we understand might be a problem. But we are not asking them to take out clean material. That is not our intent. Our intent is we need to get to the ROD remedy, we need to get to a certain level. How do we get there? Phase 1 will help us learn from that. Where we have clusters of incomplete cores, take a bucket, dredge through it, see what is there, that kind of deal.

Those are the things in the field we need to address on a day-to-day basis sometime.

MR. FOX: Thank you.

MS. HOLLAND: Next, Greg, Todd and then Victor.

MR. HARTMAN: I have two

questions here, one on the clay material. When you get the clay material brought up in the bucket, did you stop; was that clean material below that?

MR. CONETTA: Typically, there were some areas that dredged to clay lines. Once you have the clay, you are supposed to stop. The problem, as John mentioned, there is an undulating surface. It may be in clay here and you may be in sediment here. That is part of the process. You will get clay sometimes anyway. We will have to deal with it on the other end. Also when we are actually dredging this clay, we don't want to take six inches of clay. That wasn't the intent. You may have residuals on top. Can we address those? Maybe not.

The standard talks about bedrock and clay areas. We're allowed to cover with a cap depending on the residuals or contamination. We

certainly did that. But certainly in bedrock areas and clay, we need to be certain that is what it actually is. That is why we took like a month in CU-5 and CU-6 to find out what the next step was. Then we had a process obviously in CU-5; there was a flat area with strips in it. That is not something we could do well. It took us awhile to get to. CU-6 was a boulder field. While we were able to probe and get sediment in there, there were certain areas that you couldn't do much with, but still a lot of sediment in there. Maybe part of the process is maybe we need to cover those, but we did get a lot of material out of that. Was it a large area, no. But it was part of CU-6. It was boulder. Dave said they did it. I think they did as well. I'm from New York, from downstate. These guys are from up here and they're working on it. Every once in awhile my two cents is welcome, but they

worked very well together trying to get a decision. Talking about processes, we do want to change the processes. They are too long. That is part of what we can do.

Typically, when we got data, we made decisions at the table at 4:00 o'clock. If we weren't able to evaluate the data, we tried to make the decision so it didn't stall the process. Can we do better, I hope so, but we did the best we could.

MR. HARTMAN: In terms of resuspension, residual control, as well as production, did EPA specify to the contractor the method of removal, whether they would remove from the top down?

MR. CONETTA: John is going to answer this for you.

MR. MULLIGAN: GE prepared the design and EPA reviewed it. They went back and forth for a few years and finally got approvals. GE didn't like everything we asked them to do and

they didn't do them all, and that is the nature of the beast when your doing these approvals. The only thing we tried to discuss and GE, I think, agreed with, you want to dredge as close to downstream as possible. That is one of the standard issues -- we wanted to the demonstrate, do some testing, see what would happen to grade fine, fine sediment areas in the Griffin Island area. We moved downstream from the major dredging effort and worked on two CUs down there. We did it purposely to see what would happens in fine grade areas. But generally speaking, they should be working from upstream to downstream, in that direction. That's in our Performance Standards. We would like to hold onto that if we can, but we recognize it won't always be possible. Sometimes you block the canal if you try to dredge side by side, you know?

MR. THOMPSON: John, I was

really asking specifically was the operator required, in the removal of the contaminated sediment, to dig down to a certain depth and were they required to take the dredge cut down first, and take a one to two samples or were they instructed on how to do that?

MR. MULLIGAN: The spec was not clear, it was more of a navigational tool. The spec just said get it to grade, here are your tolerances. Unlike most navigational dredging specs where it would say I need to get to this line, and we'll pay for it, it just said, here is the line that would be acceptable to GE -- and they wrote the spec -- we'll accept plus or minus three inches above or three inches below. But on any given acre, you have to get the full volume out of the acre. So you have maybe three inches below that and often it's another half of an acre. So that produced these maps are 10 by 10 squares. I don't

think anybody was happy from the EPA. We had to keep this job going. There are some things GE may wish to change or may wish not to.

There was no definition that I know of. Maybe somebody at GE will correct me if I'm wrong, saying you have to take up a foot and then go back and an extra look and pick up still back, nothing like that in the spec that I know of.

MS. HOLLAND: We can address in that the next presentation.

Greg, do you have any other questions?

MR. HARTMAN: No.

MS. HOLLAND: Next we have Todd, then Victor, and then Rick.

MR. BRIDGES: John, you mentioned at one point during the presentation that you're all in favor of surgical dredging, and I'm hoping that comment was something that was said tongue in cheek. It's only reasonable comparing dredging to

surgery, you'd be talking about surgeons whose tool of choice is an axe.

MR. MULLIGAN: (Laughing) I agree.

MR. BRIDGES: But there was a statement in the Draft Report we got that referred to, I guess, the desire for additional equipment that would be available to remove between bedrock outcrops or boulders. When you are talking about, in the EPA report, talking about pulling stuff out of nooks and crannies between rocks, I think you are approaching an operational definition for surgical dredging. I mean, that would be my definition of it. I know it's not everybody's.

And further, on this point, I think the reason why it is important -- I know the "surgical" word is something that should be avoided, but in the EPA 2005 Guidance for Contaminated Sediment Remediation, and

I quote, "Contaminated sediment cannot be removed with surgical accuracy even with the most sophisticated equipment."

So I guess you can comment basically, since I made this comment, but I think it more important when we do receive the final report from EPA that EPA is very clear about what your expectations are with respect to what the equipment can achieve, what you want it to achieve, and what you think it needs to achieve in Phase 2 with regard to these issues you encountered in Phase 1.

MR. MULLIGAN: Do you want to speak on this?

MR. CONETTA: You can.

MR. MULLIGAN: With regards to the surgical dredging, I agree 100 percent that it doesn't make sense to work to tighten the tolerances.

On the other hand from EPA's point of view, if GE says they will dredge to 10.2 at this location and

they dredge to 10.8 and say, well, it's sampled, it's still hot, it's okay, we will just cap it," what do we say?

Normally, I would say if you dredge to 10.0 and you end up four or six inches below, so what. And GE says, we don't want to send excess material out all the way to West Texas, we're going to write a very tight tolerance as to what the contractor can do. If he dredges over-cuts, it a problem for them.

That's where I think the surgical-type dredging comes in, when you are actually grading and, you know, you are at the one ppm, you don't take out two feet, you try to set it up so you don't take out a six inch lift, because that is what's needed. And, of course, we learned a lot. No matter how carefully you push a probe in, if you cannot find a one ppm line, that 10 inch nugget having a difference to where the one ppm line

is, 10 inches, that's spooky. I mean, what do you do, go 10 inches deeper or halfway in between; what do you do?

MR. CONETTA: I think that is what you have to do, judge the tolerance.

Actually, I think if you knew what the DOC was, you can get to it, that's fine. But with a dredging project, you wouldn't know what the DOC is with certainty.

One of the things you mentioned in bedrock and boulder areas, we understand. We don't say you have to go crazy and dredge. We need to learn from the process in Phase 1 and make a clearer recommendation than is in the draft. We understand that. Hopefully, we will do that in the next week or so.

MR. MULLIGAN: You have another part of the question. What we ran into in some of the CUs, undulating bedrock surfaces.

We have a stone the size of an

orange, that's all you get in the one yard bucket and so they go out with rebars, GE had, and they were banging on rock here, but over here they went down to four feet in sediment. We have to find the low spots. Some were 50 feet long, 10 feet wide, five feet deep, and they dug it out. You try to do this with a 2-yard bucket or one yard bucket, I wouldn't spend a lot of time doing this. But maybe geophysics or something would show it if you're in a rocky area and you get into undulating surface that you should be dredging. That certainly would be nice to fool around with a rebar to find out if we have sediment or rock to find, try to find the 500 yard parts of sediment in the rock.

MR. BRIDGES: I guess my follow-up is a comment with respect to as you finalize your reports that come in -- this would be true for GE as well, and I know the people are somewhat casual the way they speak

about the issues -- but I think you spoke about kind of the surprises that occur in construction projects and quoting Bob Gibson, "Hudson Luck" -- I have to remember that one, but in some respects comments made yesterday and some of the wording and some of the reports suggest a maybe fatalistic attitude with regard to uncertainty in the project. That creates some ill ease with me with respect to the scope of this project, the fact you are talking about a billion dollar project, given the implications of the uncertainty with the environment and for human health, for the length of the project, for the cost the resources we consume.

It seems to me that there would be some information that could be extracted from Phase 1 that could allow EPA and GE to develop a more comprehensive "uncertainty management strategy" rather than say, well, stuff will happen, mud will fly in the fan.

I know that we are being casual here in the way we talk with one another, but I hope to see that in some form or fashion within the report.

How are you going to address uncertainty in a comprehensive way in Phase 2?

MS. HOLLAND: Todd, you are not asking for an answer right now, are you?

MR. BRIDGES: No, I'm not asking for an answer right now. We are talking casually. That is what I want to see in Phase 2.

MS. HOLLAND: You folks note that, because I want to get to some of the other questions. Do you have any other questions?

MR. BRIDGES: I do, but I will let others go.

MS. HOLLAND: All right, Victor, then Rick.

MR. MAGAR: I was interested in the some of the issues with the scow productivity -- and you did identify

at one point the trommel, unloading. Were there others? Is there a transportation analysis that is looking at how the scows are moving through, and is it a number of scows, or I assume there is more information, but there is down time waiting for data also.

MR. MULLIGAN: There is an amount of data we haven't had a chance to review at all. GE maintained a traffic control station, GPS equipment on each of the scows. You could look up on the screen on the wall and see wherever a piece of equipment was moving, where it was, and there's reports that you know where a scow was at a given month, time, where the dredge was, where the scow was. They did a first-rate professional job keeping track of all of this information.

With the total data bases, you can make an analysis. GE has done some modelling of the moving of the

equipment through the locks, as much for showing the canal people you weren't going to consume all of the lock time and slow down the recreational traffic. I do know from personal experience watching the job that quite a bit of time is lost, when you're transporting scows, particularly in the channel. You can't take a big scow out of there filled and bring in another scow at the same time. You have to take one out and it would take 45 minutes and start coming up with empty if they had one. It would be an hour and a half or two hours before you got the empty scow past CU-3 and 4 and up to CU-1 where you are working. This is something you try to manage as best you could can. Maybe you could have brought an empty scow up and used a small tug or a smaller tug to place that up against a dredge. There are things that could be done, but doing them on the fly and trying to analyze

them after the fact is tough, too.

MR. MAGAR: Filling up more scows that can't get through the system doesn't make it quicker. Somebody should be assessing where the pinch point is.

MS. HOLLAND: Victor, maybe you can ask the questions again in the next presentation.

MR. MAGAR: I will do so.

When you talk about CU-1, what role did deepening the draft have in allowing more productivity? I imagine there was somewhat of a limitation. When they were starting CU-1, there was a shallow draft, then they dredged several feet, then they brought bigger equipment in. Was there higher productivity or was it a transportation issue?

MR. MULLIGAN: The shallow draft area was not in the area targeting for dredging. It was in between the CU which was between the Fort Edward Yacht Basin and Lock 7. You had to go

across the area not dredged, but you go through four feet of waste. The dredging didn't lower that. You didn't get more draft. That was one of the issues. When they started, they were taking a scow out with two foot of mud in it. To get over that hump, they'd go over to the de-watering site and now you're trying to unload two feet down to six inches. The dredger didn't unload the scows, the contractor's did. Sean Reynolds' job was to get the scow with under 2000 or more than six inches of water and turn the empty back to dredging. That is at least how it started. It changed halfway through the job to allow them to return all the scows back with one foot of water in them. But trying to get from one foot to six inches with a bucket, that requires 21 inches of fill to fill it. They put a bobcat in the scow, swung it, a guy had a joy stick, and they did whatever they could. They were hard at work

trying to improve the productivity at the unloading area. You can only do so much when you are dredging. They did everything they could, but they couldn't get that up to speed. Finally, and later on in the project, they said we will take the scow with two foot of mud through Lock 7 and try to unload it for two hours and try to get one out and send it back. They said we will bring it to the transfer site, load it up and send it. They did the management steps, what they considered best management practices. But the unloading was a definitely a tough point.

MR. MAGAR: The recommendation that the scows be filled, more so the bucket could be filled more, or to change the bucket sides, I mean --

MR. MULLIGAN: This is an engineering design issue. My recommendation is you put a second unloader there so at least if you are unloading at the dump, construction

scows could be unloaded, but there are a number of ways to approach that. This is a materials-handling issue. GE will have their engineers handle this. I'm sure they know this. They don't want to start Phase 2 with the limitations they had in Phase 1.

MR. MAGAR: You talked about the dredging of the canal, as part of this process that they deepen the canal to allow a deeper draft if I understand correctly, of the scows moving through as something that came later in your draft in the last phase.

MR. MULLIGAN: EPA's only -- sorry.

MR. MAGAR: The answer is probably obvious, but what happens to the material? Was it processed through the facility? If there is a broader recommendation, which I think I was hearing from EPA to do more in the canal, better canal management, maybe better dredging to allow passage, is that part of EPA's

recommendation? Has anybody done a volume analysis or cost benefit analysis? For that matter, is there a cost benefit analysis to allow the upgrading recommendation, whether it's improving a week of productivity or an entire year of productivity that would come out, I think, in a cost benefit analysis.

MR. MULLIGAN: You have a lot of questions in there, Victor, I will try to answer them.

MR. MAGAR: Sorry. Starting with the canal dredging, I was asking how is that being managed, and how is that impacting cost and volume? Other things like that, variability, people looking at the cost, and impacts to the overall project.

MR. MULLIGAN: Starting with canal dredging, GE is under no obligation to dredge the canal unless it's contaminated. In Thompson Island Pool, the section 1 area is targeted for dredging. If it's in the canal,

that is part of the remediation. If the canal doesn't need that, you don't dredge it. Maybe you do it halfway, because that is what happened between CU-1 and CU-2. It was 1100 feet reaching the canal. It was not to be dredged, but it was very, very shallow.

Now, elsewhere in the system behind some of the islands, you have very shallow water, a couple of feet -- I estimate you have two feet over a sandbar to get into some spots. So the Performance Standards anticipate some "access dredging" we call it, not in the canal channel itself. Its off in the shoals, the mud flats. You have the spot here of five acres in shallow water. Getting to it, you have to cross a sandbar and that gives you two feet of draft. You have to dig a channel through that.

For the most part GE is processing and sending it to a landfill, because they don't want to

make the effort to prove it's clean before the shipment. It's easier to dig enough of a scow to get a reasonable size in there and do the dredging.

I haven't done a cost benefit analysis. I have no cost data, whatsoever, on this job. I don't even know the contractor's pay, you know, measure of payment schedule. GE considers that proprietary information and hasn't released it -- can't blame them, not my business. They are paying for it. I don't know what the arrangements are, or the costs. I am hesitant at this time to make that analysis. I can certainly make one based on generalized dredging prices and moving materials prices, but I don't think that is my job. My job is to say you have to dredge this, because it's hot. The ROD says get down to one ppm, and show us how you will do it, and we will discuss it. That is what we have been doing and

what led to the design of Phase 1. I think it's relatively successful. We sound pessimistic about the uncertainty, but, you know, they went in to dredge 265,000 cubic yards. They dredged 282,000. They did it in a year with extremely high flows on the river, 30 inches of rain in a month where we normally get six in June and July. They just had a lot of problems.

MS. HOLLAND: Victor, we are about five minutes left and I want to move ahead. Does that answer your question?

MR. MAGAR: Yes.

MS. HOLLAND: Rick, do you still have a question?

MR. FOX: No, I will ask the question of GE.

MR. SCHROEDER: Have you evaluated whether or not you think the sediment processing facility is adequate in terms of bell filter press and, whatever, trommels?

MR. MULLIGAN: Yes, I put it that in EPA's Evaluation Report of Phase 1, the Productivity chapter, Chapter 3 of the report. I said this is what it's designed to handle, and this is the maximum amount they could handle successfully.

Generally speaking, everything works pretty well, providing you're dredging sand and gravel and, you know, silty sands and gravels, and not dredging pure clay.

The last couple of weeks of the job, as I mentioned earlier, they hit clay, big balls of clay. It created havoc. They fed it into the trowel three or four times before it would go through the screen, and then it plugged everything else up downstream, so another procedure has to be developed.

MR. SCHROEDER: The final materials that you -- from Griffin Island, for example, for one that didn't pose any problems?

MR. MULLIGAN: Not to my knowledge. They have 12 filter presses with two plates in them, six by six plates, and each one delivers 600 cubic feet, 200 yards per cycle. There are 12 of them. There is one point where they had to test all 12 for a day or so, but most of the days they were running half of them for Phase 1.

MR. SCHROEDER: So the only limit at the processing facility and possibly if they were handling clay in the sense they were going through the trommels and stuff --

MR. MULLIGAN: I may change the trommels up. They had a broken beam and structural failures had to be repaired, but GE has good engineers, they will resolve that by strictly an engineering basis before Phase 2. You might ask them what their plans are. If it were me, I would add another unloader and try that, something that is readily available. You don't want

to spend millions and millions of dollars. I think the water plant worked fine. They had a severe problem throughout the end of the year, because of rail transport. They got around it by building a supplemental materials storage site on the land they have there. They did what they could do. They made a super human at Fort Edward to keep the job going. Some things had to be corrected for Phase 2, certainly.

MR. SCHROEDER: That is part of my concern. Also they weren't able to do the 95,000 cubic yards a month, so if we weren't able to meet everything at 78,000 maximum --

MR. MULLIGAN: Your question is is it correctable?

MS. HOLLAND: Two minutes.

MR. SCHROEDER: Would it be able to handle the additional 20 percent or less than that?

MR. MULLIGAN: The treatment would, the trommel system wouldn't.

Everything else in the system would. You may have a peak day and have a problem for a day, but certainly you will have to be able to send rail cars off the site at some point. You can't have a landfill that would not take waste for three months because we got a landslide or a broken machine.

MS. HOLLAND: Paul, did you get your question answered? Sorry about the microphones. This one we're going to quit using.

Todd, you have about a minute and a half.

MR. BRIDGES: Okay, it's a big project. You used a popular word, "unprecedented", you know, clean up project. Can you comment on what relationship, if any, you think there is between productivity and worker's safety. There are a lot of moving parts in this project. I understand you had a fatality this year. I don't know about injuries and such, but what is the status of that?

MR. MULLIGAN: GE is very concerned about worker safety. This is something every morning we go out in the river, there is a safety briefing every morning. This is not something GE or EPA takes lightly. There was a fatality and you can speak to GE about that. It's not related so much to the dredge as to the archeological surveys. The more equipment you have on the river, there is more of a chance of an accident. We had about 90 vessels at one point.

MS. HOLLAND: We are out of time, so why don't we go ahead. Does that complete your question Todd?

Okay, thanks, everyone. We will take a 15 minute break, and we will get started right afterwards.

(At this time there was a 15-minute recess.)

MS. HOLLAND: Our next session is going to start with Bob Gibson from GE; are you ready?

MR. GIBSON: Yes.

MS. HOLLAND: We have our panel here? Thank you.

MR. GIBSON: We are getting close to the end. I just want to follow up on what EPA said earlier regarding the processes that got us here. We started the predesign activity back in 2002. Since that time it has been a process, the work plan development, execution of the work, reporting out on the results every step of the way. These documents were developed by GE and ultimately reviewed and approved by EPA. We've had a very rigorous process to get us to the point of Phase 1, and every step of the way it was a red light, green light process that got us to a final EPA approved design that we implemented over the past year. Yes, we did a lot for Phase 2 to make things happen to the best of our ability. As John said, "super human efforts." We tried real hard. In the end, the key part of the

standard, the 89,000 cubic yards, we were not able to achieve.

What I will do today is share our experiences on the Phase 1 Project relative to Productivity, talk about the key factors we observed that influenced our ability to meet the productivity stages and implications for Phase 2.

Now, John got into a lot of detail on a lot of specific aspects of the project. Behind me I've got the GE team, and our contractors that were out there day-to-day that analyzed the productivity data. I will take a different tact. In my point of the presentation, I will focus more on the relationship of our standards and the impact on productivity. After we get to that, when we get to the Q and A part, we will answer questions for you.

I will go through a presentation now and turn it over to John Haggard to wrap. So let's get started.

Again, this process started back in 2003 with the AOC for Remedial Design. I have been working with this project on the Hudson for the past 10 years, seen it from predesign to ultimately the design and to the past dredge season. For those of you who were able to join us this past fall, I think you probably realized this project is really unprecedented in the amount of equipment, the level of activity out at the site. We're dealing with great challenging areas, shallow water dredging in high velocity areas where the stage of the river is changing on a daily basis, really low productivity work. We had 12 dredgers working at any one time being supported by dozens more vessels, the barges and all the support vessels, and all of the monitoring equipment, just a beehive of activity. This project ran 24 hours a day, six days a week. Towards the end as we were running out of the

season, we went to seven days on a number of occasions, but it was full out. As John said, we tried a lot of different things to try to improve the productivity, but ultimately we weren't able to.

Just to say something about the operations themselves, when we were out in the field we worked with EPA meeting twice daily going over the types of information being collected from the monitoring of data, performance data on the project, and making real-time decisions on what we do next. We were basically struggling to do this project within the limitations of the Engineering Performing Standards and Quality of Life Performance Standards. Each and every day there was something new. We tried something on one end to increase productivity and now we have air problems. So it was a continuous process to try to attempt different adjustments to the project to find

that point of optimal performance.

Now, I wouldn't dwell on this too long, but I do want to make a few points. We really feel the key portion of this standard is being 89,000 cubic yards, because that, in essence, is what we need to sustain that on a monthly basis for five years to get the Phase 2 project done. That's based on the original understanding of the project prior to implementing Phase 1. As you heard EPA say, there are some estimates that suggest the volumes could be greater, which means this number will go up even more.

The five-year criteria, we agree that is important for the reasons that Dave King stated, but also a projection of the benefits that ultimately was the basis for collecting this remedy were based on the project's duration, and, you know, with it drawing the project longer extends the impact further, whether it

be elevated fish concentrations or increased load.

So, again, where did we end up? Our numbers are pretty close to what the EPA presented. We estimate during the one-month period, we were up to removing 77,300. Again, about 13 percent shy of the 89,000 cubic yard number. We also removed less PCBs than what the design called for. For the deeper contamination that we got to, we got 8 of the 10 certification limits that had been targeted in the design. As EPA pointed out, we removed more sediment than originally thought, more than 86,000 cubic yards. More importantly, we took out more sediment that contained less PBC's than the design called for. So from the efficiency perspective, this was a less efficient operation than what we had intended.

As you can see on the note here, and John Mulligan alluded to this, we were required to also complete the

backfill cap work and ship off all of the dewatered sediment by the end of the year. We weren't able to do that. We had difficulties with the landfill that prevented us from shipping all the material offsite.

What I want to do now is take a little closer look at how we did relative to that one-month productivity schedule. What we are looking at here is our monthly productivity. Over here on the Y axis here is the monthly total dredged volume in cubic yards, 0 to 140,000 cubic yards per month. What this is is essentially a rolling total of our month. And what we're doing is we prepared this to see if that previous month hit our regular average of cubic yards. Over this is a black line, which is a similar measure, but here we're talking about PCB mass removed in a month in thousand of tons from 0 to 14. The horizontal bars --

MR. FUGLEVAND: I have a

question. I don't understand what that says, your rolling basis; what do you mean?

MR. GIBSON: This value here of 37,000 cubic yards would be June 1 to July 1, the volume.

MR. FUGLEVAND: It's a 30 day moving?

MR. GIBSON: Yes, moving. So superimposed we have, again, that same metric, 30 day removal for PCB mass. The horizontal lines here is 89,000; that was the Phase 1 part of it. Above that there are two additional horizontal lines, 90,000 and 109,000 cubic yards.

What this represents is the possible range of what the volumes could be if some of the estimates in the EPA report were ultimately found to be what Phase 2 was going to be. They also assumed a dredge schedule in the report that we think was unrealistic. It stepped the season to 165 dredge days. Starts early in May,

continues until the middle of October. If we utilized the assumptions we made it in the Phase 2 intermediate design and look at a more reasonable project duration for each season, this target band arises even further up into the 120 to 140 range. So what you can see from this graph here is 77,300. After this point, we never got close to the standard. I will talk a little bit about why. We will see a series of these charts that are similar.

The blue colored bars is the design inventory. That's the sediment that had been removed to the design cut lines. The red bars are the redredging passes that we did, re-characterizing the inventory, plus any residual materials that were accounted for. As you can see through the dredge season, we started early in June ramping up our production, increasing our productivity, dredging primarily dredged inventory within the original dredge prisms. At this point

we got to our peak and began to see trailing off of the inventory and increases of the redredging passes. As we were increasing our productivity, the mass of the PCB we removed was also increasing. What we were observing in the environmental data was water volume concentrations were beginning to increase until we hit the maximum rate, the maximum sediment removal rate in early August and experienced the first PCB exceedance of the 500 ppd standard, and we were shut down for two days. At the same time during the two during the shutdown, we sat down with EPA, developed a plan for starting back up, which EPA reviewed and approved, that had basically staging our start up where we began to dredge within areas that had structural control in the East Channel of Rogers Island and down at the sheet pile area down at East Griffin Island, and then gradually added dredging's back in. At the same

time we were implementing a number of project adjustments that EPA had directed us to make. You may have heard some of these discussed during John Connolly's presentations yesterday, talking about prohibitions on bucket decanting, prioritizing dredge areas where we only dredge in high concentration areas, if we can also dredge in low concentration area, active sheen control around dredged operations. All of these project adjustments taken by themselves may have had a modest impact on productivity, but when taken in their entirety, the impacts were actually substantial. And can you see after the shutdown, we had a reduced level of productivity.

Moving on --

MR. THOMPSON: Can you give me a sense of at the peak of dredging what CUs you were actually operating in, and whether actually the fact that you got past CU-1, what influenced your

ability to (inaudible.)

MR. GIBSON: We were in C-1 for the entire season. At this point our operations were spread far and wide. I think we may have been in all of the CUs. They may have all been open.

MR. KRUPPENBACHER: We hadn't opened up C-4 at that point in time.

At that point in time we hadn't finished coming down the East Channel. C-4 was not active at that point. And we hadn't gotten CU-8 yet. CU-1, 2, 3, 4, 5, 6 and 7 and also CU-17 and 18 were active. CU-17 was nearly complete. That was one of the first ones we finished.

MR. THOMPSON: Great, thank you.

MR. GIBSON: So after phasing back the operation from the resuspension shutdown, we can to see we began to see a change in the type of dredging we were doing. We were going through this process with EPA, where we were surveying, sampling, re-delineating, approving these next

dredge cuts, and these redredge volumes began to increase.

At the same time you could see the sediment removal was also decreasing as we were getting into these redredging passes. I think this leads back to what Dr. Connolly had said regarding the amount of PCB being removed in the first pass, certainly the first two dredging passes.

So basically if we take a look at where we're headed, what we learned in Phase 1, the Phase 2 project if we believe what the Phrase 2 estimates from EPA were, and we apply a blanket nine-inch over-cut, the annual ranges for production could be anywhere from 540- to 600,000 cubic yards. We did 286 during Phase 1. The monthly average, 100- to 110,000. We did on average 52,000 per month during Phase 1. Now granted, that includes a ramp up period that was designed into the schedule. We wouldn't have as large a ramp up during Phase 2. But certainly

on an average basis, we have to double our sediment removal production that we achieved in Phase 1. Even if we look at our best 30 days or our best one month period where we achieved 77,300 we would have to achieve that day-in and day-out throughout all of Phase 2 at a rate of 1.4 times what we did in our peak production phase.

Now, on EPA's production phase on Phase 2, John had said a couple of things different than what we read in the report. What we read was there assumptions for Phase 2 is that dredging would be for five and a half months from May 1 until October 15, dredging 24 hours a day, seven days a week for a total of 165 work days.

I heard John say that, in his presentation, the number is supposed to be 141 work days, and they're not proposing a seven day a week dredging. That is a relief to us, because we see the seventh day as maintenance, that being a critical component, and also a

day we can use to make up if we fall behind. But even more importantly in the Phase 2 assumptions that EPA has made assumes we wouldn't have any difficulties dredging early in the season associated with high flows, that we're not going to be shut down due to resuspension, and there wouldn't be any weather impacts. From a design perspective, you would never try to design to the best possible outcome.

In Phase 1 what we achieved was a total of 134 days where we actually worked starting on May 15th going until October 27, and we did that by pushing out our original dredge schedule by about 30 days in order to get a number of the CUs that were continuing to be re-dredged closed before we finished up for the season. We can't be assured that we will have the opportunity to dredge that far into the season in the future. In fact we heard Canal Corporation say

yesterday they went to an extra effort to accommodate us during Phase 1 to keep the canal system open longer than it's intended and they would not be able to do that during Phase 2.

So when you look at what we have to achieve up here and you start looking at this from a more realistic perspective in terms of what our dredge will release, our ability to hit these figures is even more challenging.

Now, I will turn now to some of the factors that influence our ability to meet productivity. First, as I spoke to you earlier, elevated PCB concentrations caused shutdowns. They caused a shutdown on one occasion where the whole operation was done for two days. We also had additional shutdowns where portions of the operation were shut down due to elevated concentrations. There was a direct impact associated with that, but there was an indirect impact as

well. As we attempted to try different things to reduce resuspension, we found those project adjustments caused a reduction in our overall productivity. As John mentioned yesterday, structural controls were utilized in over 60 percent of the volume that was removed. Here is a picture of the sheet pile that we installed down at East Griffin Island. There are obviously are schedule impacts associated with regard to removal of this type of equipment. As John showed yesterday our overall project resuspension rate was about 3 percent with these included. If you took them out, the overall resuspension would be about 4 percent. So they didn't result in a substantial reduction in our overall project resuspension, but they do have impacts.

Here are the types of adjustments that we implemented during the course of Phase 1 at EPA's

direction to improve on our resuspension performance. Some of the efforts early on in the project were successful in reintroducing the resuspension and primarily were related to the flow-related restrictions in the West Channel. As John Connolly said yesterday, by putting a rock dike in the East Channel, we essentially were putting an additional one third of the flow down to the West Channel. So velocities were higher and during high flow conditions, the velocities increased tremendously. You see fluctuations in river stage of a foot or two over a very short period of time. As a result we had to use mini-scows as John referred to in his presentation and basically setting up a trans-load operation, because we couldn't dig our way into the West Channel because we were in bedrock. All of these had impacts on our activities.

The flow restrictions, flow-related restrictions in the West Channel did help in terms of diffusing some early tug-related resuspension that was observed, but that was taken care of within the first three days of the dredging project.

Some of the other things like prohibition on bucket decanting, alternating the dredging areas, and sheen containment, really were of limited value in terms of their reducing resuspension, and, again, they impacted our productivity.

MS. HOLLAND: Tim?

MR. THOMPSON: You had to know this question was coming. I want you to address the question raised by EPA about scow availability. This is the only page where you mentioned the word "scow". I thought I would jump in right now. EPA estimates you lost roughly 4,700, almost 4,800 hours due to not having scows, and a correction rate of 2600 cubic yards an hour --

did I say 26? Sorry -- one hundred twenty-three-five additional cubic yards. So this is pretty substantial. I don't see it in the presentation, so I have to ask the question.

MR. GIBSON: And there is a reason for that, Tim.

MR. THOMPSON: Okay, I anxiously await your answer.

MR. GIBSON: I will give you the higher level answer first and then the details of the scow efficiencies.

Basically, what we want to leave you with here is that resuspension is what is controlling productivity. Yes, we had scow availability issues associated with also our processing facility. But, remember, back three or four slides, we were shut down due to resuspension as we max'd our productivity and our mass removal rate.

As John Connolly showed you yesterday, PCB mass removal and velocity seemed to be the key drivers

for resuspension. Without having to deal with the scow issue, resuspension already shut us down and put a strain on productivity.

MR. THOMPSON: I just need to make sure I understand that. I realize you can't look at these things in a vacuum, but I need to address the substantive issue, did you not have sufficient volume in your scows such that if resuspension wasn't an issue, you could have actually hit your target?

MR. GIBSON: Later in my presentation I touch on that. If we look at this independent resuspension, are there things we could have done to increase the productivity, yes, there are. We agree we can do some of the things, but that's really irrelevant if getting to that rate, up to that productivity rate, forces you to shut down due to resuspension.

MR. THOMPSON: I'm sorry, Bob, you still haven't answered my

question. Does, in fact, EPA's estimate, independent of the resuspension calculation, if you would, that you could have had another 123,000 cubic yards --

MR. HAGGARD: Let me address the --

MS. HOLLAND: Would you give your name to the reporter?

MR. HAGGARD: Sorry, John Haggard.

Let me address the scow availability issue. We agreed that was an issue because of, primarily because of the off-loading. We had an issue in Phase 1, which were the mini-scows. We had to go into some very shallow water and we had areas, particularly in the West Channel with water levels that would fluctuate just a couple of feet every day. The mini scows were all we could use. We didn't have many of those. That was a pinch point.

Again, we're not certain we will

see in this part of our design as we move forward areas quite like the West Channel. The West Channel is part of the navigation channel in the Hudson River. That area was a very difficult area to work in. The issue with the unloading facility, you know, theoretically, sure, we can off-load in mud, we can talk more about the details of how we might do that, but that is more of a design issue if we need to do it. I think Bob's point, fundamentally, is can, theoretically, we put more mud in scows, can we unload them faster? Yeah, we should be able to do that. Whether that equates with being able to hit a production rate of whatever the EPA number was per month is only a theoretical exercise in the sense we will be limited based on the experience we had in Phase 1 by the resuspension.

So setting that aside, can we get to some point higher? Sure. At

what point, as we heard from Carmella from the Canal Corporation yesterday, at what point do other concerns come into play? You have to look at all of these things. Sure, theoretically you can increase to some extent of the amount, but can it be 1.3? I don't think that's possible.

MS. HOLLAND: Can we remember to keep the clarifying questions to short clarifying questions during the presentation. Tim, if you want to dig deeper into this one -- no pun intended -- we will come back to that.

Paul, did you have anything you wanted to ask?

MR. FUGLEVAND: No.

MR. GIBSON: The second factor I want to talk about is the redredging. As you heard in the residual presentation, we took redredging passes in all CUs, four or more, in four of the CUs. Again, it comes back to project efficiency. The first pass removed 90 percent of mass being

removed. As you saw going through the process of CU acceptance, every time we take an additional pass, we go back, do the redo the process, go back through the survey sample analysis and decision and approvals. The more redredging we do, the more the schedule is extended.

I think there was a good discussion earlier this morning about bedrock issues and clay. We acknowledge those are problem areas and we think it's unproductive and would add very little benefit to the overall remedy. From a percentage prospective, what we encountered in Phase 1, bedrock and cobble areas accounted for about 10 percent each of the total dredging footprint in terms of acreage. And, in particular, that banging on bedrock up in the northern end of the West Channel on Rogers Island was very unproductive, it took us a significant period of time to resolve how to address those issues,

and I think we are quite encouraged to hear that EPA is willing to engage on when we encountered these types of situations, we dredged to refusal or the cut line, we cap and get out of there.

I think John Mulligan touched on the clay issues in terms of problems that were created in the processing facility. The analysis for trying to quantify this is somewhat complicated. At the same time we were redredging areas that encountered clay. We were also implementing EPA's project adjustments where we were putting more water into the barges, because we were no longer decanting. So less sediment was getting into the barge, more water. Productivity at the processing facility was backing up and that cascaded back out into the river.

Air was a big issue for us. Although this is an Engineering Performance Standard, the quality of life standards have an air standard

that was implemented for commercial and a residential value. It was exceeded 105 times during the course of Phase 1. And each time there was exceedance, we were required by our agreement with EPA, to propose mitigation, discuss those mitigations with EPA, and then move forward with the mitigation that ultimately was selected by EPA. We tried things like putting a layer of water over the barge, topping off barges that contained high PCB sediment, moving them to another dredge area that had lower PCB sediment, topping off with that, aggressive sheen around the dredged areas. After the resuspension shutdown, we were required to put absorbent and containment pools around each dredging operation, whether or not there was a sheen. And we had to maintain those throughout. For certain CUs, like CU-4 and CU-18, we had to have an on-site spill response contractor ready to respond. Now, we

had an on-site spill response contractor engaged 24 hours a day, but he was there for a different reason. Fortunately, we didn't have a significant spill-out of the river, but their role was chasing the transient sheens during the course of the project, and, you know, as Ed had said yesterday, it was a very frustrating experience. You would have these sheens that would come up to the surface. Sometimes they would come to the surface 50 or 100 feet downstream of the dredging operation, outside of the containment area. And they would come and they would go. We would be out dredging and we'd get a call from EPA and they would say there is a sheen out there, and we would stop and go look, and it was very small. A very large amount of our time was trying to chase these sheens.

Let me touch upon one other thing. We also experimented a little bit on tarping of the mini-hoppers.

This ended up being something that we stopped very quickly for safety concerns. We, actually, having to put a man on the edge of the mini-hopper, we had a man overboard issue associated with this. After talking with EPA, we got relief and discontinued the use of the tarps. So our experience in Phase 1 tells us that the things we tried to mitigate were really not very effective, and they obviously had large impacts on the productivity. In the end, I think what we concluded was air emissions were directly related to the concentration of the material that you were removing from the river.

EPA in their report had a number of recommendation that they touched on that could be used to enhance productivity. They focused on the enhancements in terms of adding more scows, having a second off-loader, enhancing the processing facility's capacity. And as John said earlier,

these were all things that we can and will consider during the Phase 2 design. But, fundamentally, the issue that we found constraining was compliance with the Resuspension Standard. Sure, adding a backup disposal facility, that's something we'll look at. And really whether we get a second off-loader or not, that depends on where the standards end up being modified. What is the resuspension standard going to look like? What is the residual standard going to look like? So until we understand where we're headed, to assess the need for and feasibility of these items is something we need too weigh.

There were a couple of recommendations -- again, we touched on a number of these during the last two days -- that we think conflict with the others standards. But, again, I will take a couple here, the prescriptive over-cut seems to us that

will enhance the amount of clean clay material that we will remove. It will enhance overall the clean material we will be moving, and the process and capacity we would use for contaminated sites. One of the recommendations is that we will remove water from the barges out on the river, off-load water so we can put more sediment in the barge. On its face, it looks like a good idea, but it conflicts with some of the direction, with some of the things that we did in trying to comply with the air standard and the bucket decanting issue. So these are some of the things we need to resolve.

In the end -- and I just want to put this chart back again -- this is John Connolly's chart that shows PCB concentration in nanograms per liter over time, the dash lines being what we experienced in Phase 1, the PCB concentrations, and a simple scaling up in terms of the max we anticipate to remove during Phase 2, relative to

what was moved in Phase 1.

As you can see there are significant portions of the dredge system where we are over the 500 parts per trillion. And this is the point with I want to leave you with, is that if we can't operate with the 500 parts per trillion standard, enhancements to the processing facility to improve our operation are irrelevant. I think you heard EPA say earlier the amount of equipment we have out on the river is sufficient to get the volumes we need, but it's ultimately constrained by this.

MR. THOMPSON: Quick clarifying question, this is, again, in the Thompson Island Pool?

MR. GIBSON: Thompson Island, the first station, downstream dredging, yes. Thompson Island.

So our conclusion, again, for the reasons I stated at the beginning of this talk, we believe the five year duration is a critical component of

the project. It really is the basis for which this alternative, this remedy, was selected. We believe as we move forward we need to use our Phase 1 experience in Phase 2 to make reasonable assumptions on Productivity. We believe EPA is being overly optimistic in their Evaluation Report.

In the absence of resuspension constraints, we may be able to enhance our productivity, maybe 75,000, maybe 100,000 per month. But, again, these are things we need to look at within the context of the changes to the other standards and, ultimately, it puts constraints on resuspension.

That's really the theme of our presentation to you in the past two days is that we need to balance these standards. We made recommendations to you about modification to be made to the Resuspension Standard and the Residual Standard. We think if those changes are implemented, if we can

implement those, the results of the project will be positive.

At this point I will turn the presentation over to John Haggard.

MR. HAGGARD: Thank you, Bob. Actually I will go back to this slide.

Thank you for being here for the last couple of days. I know we have some time to go yet. I want to discuss and summarize our recommendations for changes to the standards, but, you know, before I do that, I just want to respond to something Bob said about sort of fatalistic sounding presentations over the last couple of days.

While that may be the case, I think, at least, personally, myself, I come away with this, that we learned a lot. In that respect, Phase 1 was a success. It helped us to figure out where the problem areas are, what sort of things needed to be changed. The changes we think need to occur are in the standards.

This is not about making incremental changes in the design. This is not about making small design changes or having scows or changing the process in the facility. There are some fundamental changes that need to occur with respect to the standards.

Before I make those recommendations, I want to take a step back. Many will appreciate when you look at resuspension, stepping back in time to when this remedy was chosen and when the standards were accepted, this was a decade ago. And if you step back, when you think about what was our state of knowledge in this remedy issue and the standards, essentially, you have to go back to the 1990's and the information that was available to us in the 1990's.

I think there was a lot of debate going on about what dredging technology could do with respect to the resuspension for one thing. And

there was a lot of discussion and a lot of discussion where there wasn't a lot of fact or a lot of information. I think a lot of the belief on the ability of this technology was based on hope and not on actual fact.

Now, we've come along way. I think there's been a lot of information generated, and, fortunately, we are in a better position to, I think, bring facts to bare and replace some of the assumptions with hard information. Unfortunately, what we've learned is this: Resuspension is real. It's difficult to control. We did the best we could, and it's still here and it's going to be here in Phase 2.

We've seen the same thing, box river, pilot studies that have gone on, there are similar rates with the resuspension with this dredging technology. There is an independent group, National Research Council, independent of EPA and independent of

the industry who took a look at this and concluded resuspension is real. That came out in 2007. I think for most of us that practice in the field, we know that is not a big surprise. But that was the first time we had an independent body firmly conclude that resuspension and other issues with dredging could compromise the benefit. And certainly the group out in Utah, the Four R's Program by the Corp of Engineers, dove into it more deeply and recognized what the technology can and cannot do. Now, on top of that we are fortunate in that we now have the best monitor dredging project ever. The amount of data we generated in Phase 1 is tremendous. Again, it puts us in a position to replace the assumptions with pure fact about what this technology can cost. When we step back and say how did we do against the standards, we could not, did not meet the standards. The standards could not be met in Phase 1.

Unless there are a fundamental changes to the standard -- and I will review those -- we wouldn't be able to meet them in Phase 2. Again, I want to repeat, this is not about design. This is about changing fundamental standards.

Now, I just want to talk a little bit about what did we learn, to summarize it, and before I do that, years ago I was at a presentation you had given, you brought up about the context of uncertainty, the Rumsfeld quote, the known knowns, what we know, what we know, or what we think we know on a given project, the known's and unknowns and things we know are a problem but there are things we don't know about it, they are uncertain, and the unknowns, things we don't have a clue about until the Hudson Luck kicks in. A great example of that on this project was one day of -- and usually things happen on a Friday night or a weekend -- we discovered 4,000 sticks

of 100-year-old dynamite while we were constructing the de-watering site. That's one of those things that falls into the unknown-unknown. That was just a complete surprise, and we'll have more of those going forward. I will come back to this.

We do have uncertainty. As we went through Phase 1 we understand more about the uncertainty. A good example would be the bumps of the DOC, what's the actual depth of contamination. That is not completely an unknown, but it's an uncertainty.

Are we going to have those, have high floods? Sure, sure, that is not completely unknown. The question is how can we develop standards that address the uncertainties in a positive way? We can do a project and it can be a successful project, but we have to come up with things to deal with the uncertainties.

What will happen in the Phase 2 that will reduce the uncertainty? We

have a good understanding of resuspension and how much resuspension we will get. It's related to how much PCB mass we will remove. We are uncertain of that, but we have a good understanding of that. Can we describe exactly X amount of PBC's lost as we are dredging the sediment? I don't think so. Or a tug moving out, no. And I don't think we need to. I think what we really need to say is we had an operation going on. A dredge is a combination of pieces. It's a tug, it's a spud, we have support vessels. You have all of that together. We lost three or four percent of what we were trying to dredge. That's a good understanding. That allows us to go to Phase 2 and do predictive work of what we can do in Phase 2.

The EPA did what they did to hold down resuspension factors. Some of them were, frankly, more cosmetic, but we did them anyway. They were

fully utilized and as Bob and others mentioned, we had resuspension controls, engineering controls, yet we still had significant PCB loss.

What we've seen is also consistent with other sites, and then there are other factors that came up. Are they critical to understanding resuspension, decant water and sheens, as an example. In our report we described these in detail. These are secondary factors. They are not advancing our understanding a whole lot. They were important to look at. We made sure we looked at them, but it's very importantly the load -- and this is probably the most critical factor -- again, driven by resuspension. But the load standards are critical. We exceeded it and we exceeded it by two to four times.

The other issue is on the redredging, very inefficient. We spent a lot of time and a lot of effort trying to close out CUs. We

were chasing ever increasing amounts of PCBs, which impacted productivity, and in Phase 2, this will be an important issue for one very important reason. If you look at where we dredged, we tried to limit ourselves upstream to downstream. We were operating in three separate areas in Phase 1. We wouldn't be able to do that in Phase 2 in many areas. We can operate the East Channel and we can operate the West channel and then we were miles downstream doing the tests. But in Phase 2, it will be much more important that we close the CUs up as quickly as possible. We will be in the linear structure of the river where we have to move upstream to downstream primarily in one location.

We also learned about clear relationships among the standards. I think there was a discussion of conflicts in relationships. There were conflicts in understanding. The more we dredged when we reached

productivity, we exceeded the resuspension limits. That is a conflict. If what we want to do is keep resuspension to a certain level, 500 part per trillion (sic) is one we think we should have kept, then we only have a certain amount of production goal. If you try to increase it, that's a conflict in the standards.

The residual, again, very little productivity in second, third and fourth passes. Then on residual keeping the areas open, there is a general agreement, we can't tell you how much resuspension occurred as to having them open, but the general agreement is we need to get these closed to help control one element of resuspension.

Now, what does this tell us about Phase 2? Obviously Phase 2 is bigger. Bob showed you some information where Phase 2 is now going to be twice the amount of dredging.

The intensity of the dredging, we have to remove PCB at twice the rate we did in Phase 1. That is going to create resuspension problems, and, you know, based on the estimates we have for resuspension, we are going to greatly exceed that load standard.

Again, going back to the point raised earlier, to have a good understanding of how to estimate or extrapolate from Phase 1 to the Phase 2, load estimates. We have a reasonable understanding, not perfect, but a reasonable understanding to make judgments.

MS. HOLLAND: I'm sorry, John? (Indicating time.)

MR. HAGGARD: As Bob mentioned, and you folks can refer to the modifications, I'm sure to some extent you can, but, again, coming back to this relationship. You can't do that on the back end. You really need to focus on looking at all of these standards together before we can opine

and make changes to one of the standards. But there are standards you can make to increase productivity.

I think the biggest uncertainty that comes out of everything we learned in Phase 1 relates back to the PCB load, and as John Connolly went through with you, we don't know what the acceptable load is, and that is driving us, what potentially would we do in Phase 2 --

MS. HOLLAND: John, could you hold your microphone closer?

MR. HAGGARD: Yes, sorry.

So what we will need to do is really in the first instance, we need to try to figure out what is that load. If we send too much downstream, we will modify the benefits of this remedy. So overall, I think we are in a good position to make informed judgments. We learned a lot in Phase 1 to be used to help us do that.

We were talking a bit about this yesterday, but in a little more

detail, I think the recognition is that we need to change the standards. One of the things we looked at is what can guide us in changing the standards. We talked about protecting the benefit of the remedy. One example we used is making sure we don't send more PCB downstream than would otherwise occur without dredging. And that goes back to the slide over here on the left of the poster. You want to reduce fish levels and reduce water levels, and we will do that in away that minimizes what goes downstream in terms of PCB resuspension. That is why the performance standards are there, to protect the benefits, and, again, any standard we try to put together, we need to evaluate the interactions, the conflicts, and to reconcile the conflicts and balance them so they work together. That is something that we think is important to take a look at. Thus, being practical, the

standards have to be implement-able, they have to be based on technologies that are available. Phase 1 is a test or was a test. Phase 2 is not a test. Practicality is and efficiency is important. We want to get into the river and get out of the river in an efficient way, not have waste in effort.

One thing I want to emphasize is the amount of equipment we have to have in the river is pretty amazing. I don't think there is another dredging project that is as quite as complex. We are dredging thin cuts with big machinery over a thin bottom, not deep cuts. Orchestration of a lot of equipment, inherent logistical problems and inefficiencies -- we need to be efficient. Lastly, there is another thing to be considered here, not necessarily for the panel to consider, more obviously the EPA. Once they do finally set standards, they have to make sure the whole

overall remedy is still effective. So keep talking about the load. I will get to the overall recommendations, but the load is important.

If you look at the load it's a pretty simple algebraic equation. How much PCB load gets sent downstream which is a primarily a function of the PCB mass, and our resuspension rate. During Phase 1, we saw three to four percent on average. We had lengths higher and lower as John Connolly mentioned, but we had extensive controls. I don't think we will do a lot better than that.

In fact, as we move downstream, as we get closer to the far-field station in Waterford, we wouldn't have the declination that occurs, so we're going to have even more problems.

So if we look at the two different approaches that are being discussed, EPA's approach and our approach, EPA's approach said it's okay to send three times more PCBs

downstream. We want to change the goal, move the goal. We want to increase the load.

We don't think that is the right way to go. We think that compromises the benefit of the remedy. We have gone over that yesterday.

Our proposal is that we need to set what is the right load. Then we need to work towards that load in allocating where we dredge, where we take the PCBs from, so that we can get the benefit that we need without impacting the benefit of the remedy.

Again, protecting the benefit of the remedy is key here. We think we have a series of performance standards that do that. Again, we are not suggesting 500 and change. It's a number that is intended to protect the public drinking water system and it should remain. Again, on the load it needs to be set. It's not a number that has been determined yet, but it needs to basically keep the amount of

PCB's that go downstream, bioavailable PCB's, less in natural attenuation. And EPA needs to use their model -- and EPA's models need to be upgraded to determine for you, to see what is the acceptable load that can be set for this project. It is not the percentage of what can be taken out of the river. That's not a risk-based approach to do that. Updating the EPA model will allows us all to get actual numbers that would protect the intention of the remedy.

Then during design, we can really target for removal those areas to get the maximum benefit. On the residuals I think there was a general agreement, we need to streamline the approach. We spent way too much time digging and re-digging. We got 90 percent of the mass out of the first one or two cuts. This comes back to what do we know and not know? How do we deal with uncertainty? Based on what you have heard from John Connolly

and the data taken on Phase 1, we can manage it in high confidence areas. We found we could have PCB mas removal with a high level of confidence with the first cut. In low confidence areas, we were still able to get 90 percent of the PCBs with two cuts.

Our proposal is we go to the design guides, low confidence areas, for example, we will re-characterize, re-cut and then dredge. That will allow us predictability. We're not going to over-cut, not generate tremendous amounts of unnecessarily clean material that will become contaminated in the process. We will also then be able to effectively sequester the PCBs. Also as Bob mentioned, redredging rock or clay, that is an inefficient process. It not only slows us down in the field, but slows us down in the decision-making process.

Productivity. We want to keep five years. We think it's important.

We have seen PCB levels in the water and fish increase. We want to limit the number of years this occurs. So the five years we think should be retained, particularly with the revisions. This needs to be done as a group, not as an individual.

I will leave you with this, certainly, I appreciate the opportunity to address the panel. If you have any other questions, obviously, we are here to answer them. Going forward, we will work through with the contractors in addressing any comments you have going forward and any information or questions. Thank you.

MS. HOLLAND: For the panel, after this opportunity for you to question GE on productivity, we have an hour for overall panel questions. If some of the questions you are thinking about, you also want to hear from EPA, maybe just hold that one, we can end the just GE Q and A earlier,

and you can shift more time into the last question on everything for both EPA and GE. Focus on the questions of just what you want to hear from GE on Production, and then we will move into the next segment whenever you folks tell me you are ready.

Any questions?

MR. BRIDGES: I ended by asking EPA a question they didn't have time to address, and that is worker's safety. There is no doubt you'll are committed to worker's safety. From all I have heard, and I'm not asking for you to prove to me that you are committed to worker's safety, but I'm more concerned with just the reality of a project of this dimension and size, the pressure, just pressure inherent to a project of this size to meet productivity standards, how that might or does translate into implications for risks to workers.

MR. GIBSON: GE has a world class safety program. Over the course

of construction of the facility in the dredging of Phase 1, we did had in excess of 1.4 million man hours during the course of that. And we had our first loss time incident late in the season with a worker stepping off of a tug onto a barge and onto a dredge platform. Did it all year long, and at that time his footing was wrong, he slipped, and he had a ruptured Achilles tendon. So I'm very proud of the safety program that we've accrued during dredging.

We had a very unfortunate event that occurred with a fatality in November. This was a contractor working on the design for Phase 2. We were finishing up Phase 1 dredging already and moving forward in design, and it was a late in the season activity, something we were trying to fit in before the season ended, and it happened after the canal closed. And you are right, this project is going to be more dangerous in the, early in

the season and late in the season. And that is one of the drivers, that we're saying when we make a reasonable assumption on productivity, we have to do something that minimizes time trying to dredge in overflow conditions, and minimize the time trying to dredge in cold weather conditions.

Imagine a dredge platform in a barge with ice on it, you know? So there is no question there is attention to safety on productivity and for the duration. And I will tell you, we wouldn't make the choice for productivity, but we would err on the side of safety.

MR. FUGLEVAND: I have questions on productivity. The appendix to your report about detailed discussions of productivity, there is a pie chart. The pie chart shows the distribution of working time for Phase 1 dredging. So one are the components is called dredge prep, it's 7 percent. What did

dredge prep mean?

MR. INGLES: Paul, that is essentially a scow change. It is the term used for that. It's prepping the scows to be taken from the dredge and the time it took for the scow to be taken and the new scow to arrive.

MR. FUGLEVAND: Thank you.

So then on the same chart then it shows between barge prep time, 7 percent, waiting for mini-hopper, 11 percent, and waiting for hopper barge, 13 percent; that adds up to 29 percent of the working time. That is, by my experience, a significant amount of time. And I don't think you have really spoken to that and explained that, rather you keep saying that is a design issue. But there are several factors that come into play that effect that. The traffic on the water, all the different equipment, and just EPA said how awful that was, and I haven't heard you come back and say, you know, here's what drove that,

and it wasn't just incompetence. That is the sense we got from EPA, that it was incompetence. I would like you to address that "incompetence."

MR. KRUPPENBACHER: We will break that down a bit. We talk about the prep time. The other two big numbers that are percentages, one that's 13 percent for mini's and 11 percent for hoppers, the mini's -- and as John Mulligan said -- these were the shallow draft barges. You raised the traffic issue as well. Taking it one at a time, the mini's, the down time or wait time on the mini's is associated with the 320's and trans-load operations. That happened in the West Channel predominantly. It's the time spent waiting for the mini's to get back up to the 320's, dredging in the rock and cobble areas and clay in CUs 5, 6, 7 and 8.

Based on our analysis of the mini's, we had seven mini's and one super mini. It appears to us that we

were short from mini cycling. It wasn't the transportation, the trans-load operation, just the numbers, the balance of the number of dredges we were working on and number of mini's transferring back and forth in between.

On the hoppers, the situation is different from what we've seen. It's not related to a transportation issue. It's predominantly related to the unloading operation, by and large. We have been looking at the unloading operation. We haven't completed all of our conclusions on the, but basically there were five factors entered into that that related to the barge, the time it took us to cycle hopper barges.

First of all, about 55 percent of the volume of the material came out of the East Channel of Rogers Island. As John correctly pointed out, every time we went to East Rogers Island, we had three contiguous CUs that we were

working on, and we typically had to move an operation to the side in order to take a hopper barge past to get to the north end to the upstream side. This gets to working upstream and downstream. What we did this year, very unique and challenging, was that we had to go over un-dredged areas to get to the areas we were dredging in, or we had to pass dredging operations in the East Channel in very narrow water. There was a movement to clear the area.

Another item that everybody talked about earlier, John was going over, was the unload rate. The unload rate at the unloading wharf was lower than had been anticipated. But that is not the only factor. We also dealt with 53 percent of volume of water in barges. This took us more time. There were ultimately adjustments made with EPA's approval during the year. We added de-watering positions as prep positions to the actual sediment

composter. We took out as much of the water as we could.

We also were challenged by the fact we were putting water into the barge intentionally to deal with air issues. So on one hand we had to deal with the unload operation and the stability of the barges during transport, and the other thing we are dealing with the quality of the air.

We also dealt with scow change at the unloading position. That was one of the things that consumed a fair amount of time. In the end when you look at the analysis of breakdown of time related to the unloading operation, it took us, on average, an hour plus once we got good at it moving the scows at the unloading position. So that also is a factor in that.

Then the impact of the materials that we were working with affected the unloading rate. What would happen when we were unloading clays, we

typically had a clean-up cycle we had to go through with the mess that it made in the trommel ed areas. There was down time from that as well.

So those are factors that kind of impacted what happened with that 11 percent for the hoppers. But the mini's themselves were purely recycling in the West Channel.

MR. HAGGARD: Can I add one thing. Just one thing that I puts my hackles up a bit -- I know you're doing it as a way to elicit a discussion here, but I think what I heard was that Phase 1 was a test. We designed it to try to get all of this material out. We had a very good contractor who did the work according to the approved plans and oversight of the agency. We learned a lot. That was really the intent here.

When you look at the cycle times we had and the efficiency, that's where we are now able to take that and say, how do we become more efficient,

what did we do and learn, and, obviously, that is going forward to improve the efficiency. Based on what we learned, part of what happens in Phase 1 is we had to have a lot of flexibility on contracts and with the contractor to respond to whatever happened. So I think at the end, I think John Mulligan concluded, we may have had more than we needed. When you look at the efficiency of the equipment, it tends to support that view. So, obviously going forward, if we take what we learn, certainly we will become much more efficient. And the standards will also help.

MR. FUGLEVAND: Can we circle back in on this figure that shows, first on waiting for mini-hopper. On that topic, I heard two things. One is you were given very shallow areas which were not characteristic of the rest of the project. There wouldn't be as much need for mini hoppers in the next phase, so that might not be a

factor going ahead. And the second factor, you might put in more mini-hoppers; is that correct?

MR. KRUPPENBACHER: Yes, that is correct. There are shallow areas, that we do have to work in those areas, you know, going forward, and that's being looked at as part of the final site plan.

MR. FUGLEVAND: And putting more mini's in cycle would help in lessen the down time waiting for mini's.

MR. KRUPPENBACHER: Yes, that's possible. Looking at the size of the mini's, the mini's were a collection of flexi-floats. You know, so it's a matter of at that, balancing the draft.

Something else, not just the shallowness of the area, but one of the issues that comes out, the high fluctuation and water levels in the area. It cycles on a daily basis 12 to 24 inches, typically a 12 inch range, but you lose that much. You

have to watch that when designing the vessels. The water you have at ten in the morning is not necessarily the water you have at four in the afternoon.

MR. FUGLEVAND: The 13 percent average waiting for hopper barges, it sounds like you were talking about issues that will improve that at the drop-off facility. Do you sense that will be less in Phase 2, waiting for hopper barges?

MR. KRUPPENBACHER: Yeah, that would be the intent, you know, of the changes that would be proposed. We are looking at that as part of the design. That's something that, like I said, the evaluation is still underway as to where the pitch points are.

MR. FUGLEVAND: All right.

MR. SCHROEDER: I would like to follow-up on what you have learned and how you have projected those impacts in the second phase, such as, you know, various things you said were

limitations. You just discussed some of them, that there will be wider areas for navigation in terms of passing barges, maybe less disruption. There is the possibility, again, of increasing the number of mini barges to reduce your offset or down time. Also the possibly a second off-loader or something going on there.

Is there an overall estimate as to how production could actually be increased over your actual production of Phase 1?

MR. KRUPPENBACHER: I think Bob actually pointed out the things we looked at.

MR. SCHROEDER: He showed 75,000 --

MR. KRUPPENBACHER: Yes, 75,000 to 100,000, right. And resuspension and residual issues aside, we believe that is something that attainable.

MR. SCHROEDER: The percentages that Paul had quoted were almost 30 percent of the time that could have

improvement it would appear, in which case that would be almost a 40 percent increase in productivity if you could eliminate all of that, which I'm not sure that's possible.

MR. KRUPPENBACHER: You're not going to be able to eliminate all of it. As I said, we are evaluating what the factors are, that attributed to that. Not all of that will be wiped out. You will not make that to zero.

MS. HOLLAND: Greg, then Victor, then Todd.

MR. HARTMAN: Did you have a systematic way of removing the material that's top down or from other than just specifications of the total line and depth to be found?

MR. KRUPPENBACHER: There was -- as was correctly pointed out, this spec did not have a descriptive process for the contractor. We relied on the expertise of the contractor we hired to determine that. I can tell you they developed a protocol followed

by the operators. When we were in deeper cuts, they would take larger, full bucket bites to take it down to near grade. After the bite at grade, there was a second bite at grade. This is prior to what John Mulligan's talked about, that he would prefer.

MR. MAGAR: I have two questions. One was a comment that was made that as you have more production cuts, you go to a third and a fourth. This becomes, your productivity becomes less efficient.

Now, taking out the down time part of this process from bathymetry to sampling and the work that you're doing for your surveying and sampling, there is no fundamental reason why the third and fourth cut would be less productive than the first and second, or are they actually less productive?

MR. GIBSON: In the case of dredging bedrock, our -- obviously, our cubic yards per hour went down.

MR. MAGAR: That is very

understandable. Bedrock aside, because you had some third, fourth, and fifth cuts, we're just talking about volume productivity and then realized that efficiency, the PCB removal might go down. Does your productivity change? Is there a possibility you can go deeper, and does it increase with the bigger buckets?

MR. GIBSON: No, I mean either re-dredging passes where we were taking thinner cuts, there was more water. The more water at the barge, those are the type of things that showed an impact on productivity. The ability to take material out, you know, aside from bedrock, was there a difference there? I would defer to our productivity experts here. I don't think that is the case.

MR. MAGAR: Is there an opportunity -- I don't know if you can answer this now, think about it, maybe, not -- alone the quantity of

the cuts, but the quality of the cuts, I can appreciate that. Statistically the quality of the cuts is decreasing as you go from first, second, third, fourth and fifth, but maybe there is a uniform rule the first two cuts are most efficient. But the quality of cut, getting bedrock, seems like there was a real inefficiency for all of clay you just spoke about, you can get out of picking up clay and putting it in the trommel. Can you sort that out and do you think about that regarding in the final phase?

MR. GIBSON: I think we can do that and get back to you on that. I do want to make a point, though, relative to the cut and the accuracy of the cut, and some of the discussion about surgical dredging.

We had a three plus or minus tolerance on the dredging cuts and the contractor did a good job at that. They were taking tiny bites. They were taking a six inch pass. Part of

the problem we had initially, and we learned from this very early on in CU-1, was we were trying to get compliance with elevation on a 10 foot by 10 foot square. And so we would go out, they would do a survey, and you have a half dozen squares above the cut. They go out and do their thing, and go and resurvey again; it's another six in a different location.

What we were seeing is the impacts of debris in the base of the cut sticking up. We would see impacts associated with placing the spuds in the dredge area. And in the end we realized we were chasing our tails and we needed to move away from that, and we did. So the characterization that we were spending a lot of time throughout the dredge season nibbling and taking small cuts, I just don't believe is correct.

MR. MAGAR: When I say quality, I don't mean the quality of your contractors, but the things you are

targeting. If you could go back to what John said, if you could reflect on when you encountered these different things that are more predictable, how do you plan to encounter the various situations from debris and different kinds of debris, and how does that change your approach to what you're removing and whether, you know, and so that you and the EPA can have a better and more rapid decision to approach that?

MS. HOLLAND: Victor, are you asking for that in their report or now?

MR. MAGAR: If that is appropriate, yes.

MR. HAGGARD: I think that is just a great comment and another indication we need to learn as much as we can to make this project more efficient going forward.

That point that came up before -- hasn't really come up, but trying to get the 10 foot by 10 foot average,

one of the recommendations the EPA has made in their report is to change the 10 foot by 10 foot average to now a 1 foot by 1 foot average. Instead of having over an acre with 400 opportunities, you're going to 40,000 opportunities to have to go back and nibble. And that's something that was a recommendation -- hasn't been brought up here, but it's in that report to actually change that to a 1 by 1 foot compliance, which will drive us crazy.

MR. MAGAR: I see them nodding their heads.

MS. HOLLAND: That might best be put to our next session.

MR. HAGGARD: The next point, I think about the efficiency -- you really need to go to the next slide -- how many cuts we can take and the quality of the cuts and what does it mean. This is not about removing sediment for the sake of removing sediment. We have a very focused

program. It should focus on how efficiently do you focus on the mass, and that is what we will learn from Phase 1.

MR. MAGAR: Can you go back to the productivity slides? That one is good.

This is interesting because you had a resuspension shutdown clearly when you peaked right at around 79. But if I look at the overall productivity, you know, it's pretty flat from around 8-1 and beyond, around maybe 65,000 cubic yards. Looks like a fairly steady productivity around that rate. You only had one shutdown. I realize it goes more day-to-day, but this is a 30-day average, but as the concentrations have gone down that might affect that. Could you see an increase in productivity without impacting the resuspension standard? Did you stress it other times where you got close and pulled back, or is

it just one incident that you are stressing a lot of the argument on?

MR. GIBSON: We did have further stress with challenges of meeting the standards later in the season if we had exceedances of the 550 ppd standard. They resulted in partial shutdown of operations. For example, we had one where we were dredging really highly concentrated material in CU-14 and CU-18. After we were told by EPA to stop dredging those areas, move to lower concentration areas. So, yes, there were impacts using that standard. Even though we were dredging at a lower rate, we were never able to get back up to the peak volume we got because we ended up dealing with these redredging issues and the bedrock and clay issues.

MR. HAGGARD: The point you made that we had this one incident, I think when you step back and look at it the incident of the shutdown was helpful in helping us to learn what was

happening, but it is the entire data set. Every day we were gathering PCB information during the operation. We knew what was going on. As John Connolly said, we mined the entire data set to understand what it was in terms of PCB loss, in terms of what was in the river. You can't look at one point in isolation as our main learning point.

MR. MAGAR: That comes to my last question. I don't know how challenging this is, but is there an ability to balance high and low concentration areas to maintain productivity?

MR. HAGGARD: Well, that's an area whereby pushing the pieces to the side of the plate, sooner or later you have to eat the pieces. There are ways to do it. Ultimately, we have to get out, and -- sooner or later, you have to get the mass out before you decide not to take that mass.

MS. HOLLAND: You have about 10

minutes for this phase of the questions. I have Todd and Tim and then Paul Schroeder.

MR. BRIDGES: I shouldn't call these things questions. Sometimes I make comments.

MS. HOLLAND: If you want to make a comment, let them know you don't want them to answer. It will save time.

MR. BRIDGES: I would like to see this addressed in some fashion in both of your reports as to the fundamental issue of Productivity. It seems to me the way it is structured now is the standard is treating this whole project as a dredge project, and not as a remediation project. What do I mean? If you are looking at this as a remediation project, your definition of productivity is how many CUs I closed per unit of time, not how much stuff leaves the river in a period of time. That is the kind of definition of productivity that we use in

navigation dredging.

And that obviously has ramifications for several ways in which you approach the project, that, you know, in regard to CU-2, for example, one of the factors that had been mentioned, but it's not within the focus of much of the discussion, there appears to be almost as much time spent resampling in between passes and decision making relative to that, and the redesign of prisms as there's actual dredging. So, you know, that's the largest contributor to what my definition of productivity is, how many CUs you close in a period of time.

MR. GIBSON: We agree with that, but while it's not a specific productivity metric, the number of CUs closed is one of the things I wanted to show you. We think we are reducing the uncertainty and addressing the number of redredging attempts in the residual standard, it will allow us to

move more efficiently. I think that will address exactly what we are talking about.

In terms of Phase 2, units 2, 5 and 6 were our poor orphan children that had bedrock in them, that we had a tough time coming to a conclusion on how we would deal with the issues. It's not so much the example of those three CUs, the sampling and survey and analysis, but it was trying to reach an agreement with EPA on having a solution how to close those CUs out. I'm encouraged to hear over the last two days there may be a way to avoid that in the future. You are right, CU-2 was a problem for us.

MS. HOLLAND: Tim?

MR. THOMPSON: I will follow-up on Greg's question. For informational purposes in the beginning of a dredge on a CU, your contractor would go through it and more or less equitably take off one or two feet in one portion and dig a relatively steep

hole. How do they maintained slope cuts that would cause residual of the slope?

MR. GIBSON: The dredging contractor laid out the dredge plan. They essentially set up planes in roughly 40 feet lines? They moved upstream to downstream taking bucket bits the width of a lane and moving south.

MR. THOMPSON: Good, I wanted to hear that. I wanted to be sure we would be able to see those in a report that suggests you have a dredge pack of data on that. Will we be able to see the bucket prints or do we have to go out and look at data that is there?

MR. GIBSON: I think you need a dredge pack in order to see the procedure.

MR. HARTMAN: Was that in the CD that you gave these guys?

MR. GIBSON: No, the CD came with the data compilation report. The mysterious CD we were talking about,

basically on that is every document you need to understand the planning and design that went into this project. Everything from QAPP to work plans to the Intermediate Final Design, the Culture Resources Report, everything from soup to nuts.

MR. INGLIS: It's just a real-time view of what actually happened so if you want to sit there and watch exactly how the dredge behaved in the real-time view, that's what you will see. Seems like you're looking for cut lane, layouts and the dredging technique.

MR. THOMPSON: The actual footprints I would hate to have to reconstruct everything. I thought somewhere along the lines you would have that.

MR. INGLIS: We can take a look and supply those.

MR. SCHROEDER: Since, you know, your presentation certainly emphasized resuspension is going to limit

productivity based on what you have seen at this point, there are several things being proposed in essence to reduce resuspension in part by speeding up the closure process for individual CUs. Do you have any modelling or predictions, because I know you were estimating when you say 3 percent of the materials are resuspended or lost, and I don't believe that we have any predictions as to how we tease that apart in terms of how much is during active dredging from a particular CU, how much is going from waiting until we go to the final closure, backfilling or capping. Do you have any idea as to how you would break this down, or potential improvements in resuspension could occur if we change the residual standards?

MR. HAGGARD: Let me have John Connolly address that.

MR. CONNOLLY: That's one of the things that we are in the middle of

looking at. We don't have an answer yet. We do see if you remember towards the end of the project, you see a lot more resuspension than we can account for based on the removal. At that point everything was pretty much open in September. We are starting to close things, that maybe some of the things we see there -- and as we continue to analyze the data, we are going to use that part of the project to try to get some sense of what it might become. Before May we will give you a more substantive answer to that. As of now, we don't understand it all that well.

MS. HOLLAND: Paul?

MR. FUGLEVAND: I have a question that of something that may be helpful for me to look at. That would be tape 1 of the CUs, maybe a simpler one, if there was a simpler one. And a series of possible graphics. The first graphic is one of John's orange maps that showed areas within a dredge

and the depth of dredge, then ultimately the next dredge plan, the dredge lanes and bucket, and come back and just -- then, you know, through a series of a couple of figures for each pass, you could see what your course said. And I think one of those we will see that, apparently, the second pass had dredged out a square out of the CU, there might have been that you had three or four sub-areas to do, and they will think it's more complex than maybe appreciated. Maybe a series of graphics that shows the first cores, how much you took off, maybe. I know we are asking for something that may take some time -- in the next month would that be realistic?

MR. HAGGARD: One thing we can do in the next hour, we got graphics for one of the CUs, maybe two. We can walk you through that, maybe that would be useful. Of course, as time provides. Do we have time now or --

MS. HOLLAND: We don't have time

now. We have one minute until we need to segue into our general Q and A, maybe time to shuffle chairs.

MR. FUGLEVAND: Maybe you can e-mail it to us.

MR. HAGGARD: If the panel wants to hear it in the next hour, we would be happy to provide that for you.

MS. HOLLAND: I would like to propose that we are coming up on the hour for panel questions on the overall presentations. Let's take a minute, let the folks do a chair shuffle. You guys, if you have to go to the bathroom do so quickly, and come back in three or four minutes, and we'll have the EPA, we will have the key presenters at the table, and behind you have your support people in the chairs so you can call on them easily.

(At this time there was a 10-minute break in the proceedings.)

MS. HOLLAND: I asked the panel be clear who they want to answer the

question first. They told me they are quite open to hearing from both entities on each question, but there will not be rebuttal.

So if they ask EPA a question first, GE can also respond, but EPA cannot go again. You can each answer one time unless the panel wants to initiate another round. So they are in charge basically, and I'm the referee. We don't have tennis balls and racquets.

So we have Tim and Todd. By the way, we will take a full hour and we will carve it out of lunch.

MR. THOMPSON: This is indeed a question for both EPA and GE, and I will start with John.

I think there's considerable confusion on our part on where the 500 nanograms is applied. I have heard EPA say at the water intake, I've heard you guys suggest that it's at the end of the Thompson Island Pool. I can't -- frankly, I went back to the

Resuspension Standard, and I don't see that as clearly as I thought I would like to. I think that is a fundamentally important question for our understanding to say where, in fact, that applies. I will start with John because Ed is tardy I noticed.

MR. CONNOLLY: Fundamentally, the 500 is to protect the water supply, but the way the resuspension standard is set is that we monitor that at the first far field station and the shutdown criteria pertains to the first station, so it is the value at the Thompson Island Station to determine whether we had exceeded it, and whether they would have to then shut down dredging operations.

MR. THOMPSON: Then EPA, is that your interpretation?

MR. CONETTA: Yes, that is essentially correct. It is to protect the water supply. Obviously the first station is the most important.

MR. THOMPSON: Okay, thank you.

MS. HOLLAND: Todd, then Greg and then Victor.

MR. BRIDGES: I would like to ask GE first and then EPA to make a brief comment, a minute or so, about what I'm about to ask. Further, I would like to see this question addressed in some fashion within the final reports. Here is the question: How, to what extent and how do the approaches, principles and directions provided in EPA's Contaminated Sediment Remediation Guidelines published in 2005, apply to, you know, how does that relate to either the existing Engineering Standards or those that you are proposing, given that the activity levels and RODS, those standards were produced prior to the publication of that official guideline?

MR. HAGGARD: Obviously, the guidelines is a guidance, and it was issued after the decision. There are things as you are well aware of, Todd,

that are germane to this. There are recognitions that when you look at sediment sites, it's not one approach at any given site. It's a combination of natural recovery, removal, very site specific determinations, but typically it's not less removed mass. The focus and guidance is to remove viable mass, it's not digging sediment or taking sediment out. What you're hearing from us, at least, is supported by the guidance that has been issued. Whether or not the remedy that is issued is consistent with the guidance is best for EPA to make a judgment on.

MR. CONETTA: The short answer is we will try to answer that in the reports, Todd. I don't happen to have a really good answer for you at this time.

MR. HARTMAN: I have a problem with the dredge, clay dredging, and I would like to address with GE.

Basically how was the clay

dredging accomplished, and was that clay considered a clean material?

MR. GIBSON: It was considered a clean material. It was recognized -- when the dredger identified clay, he was to stop and notify a construction manager to come out and verify and bring in the EPA on that.

MR. HARTMAN: When the operator was making the cuts in the buckets, you basically had, like, an 8-inch to 16-18 inch cut, and he would take the bite. That bite would hit the clay and pull it up and you'd see it was this bucket. You just know the material is in the barge and someone would come and say, yes, you don't need to dig deeper here?

MR. GIBSON: Yes, that's right. If you look at the design, they delineated clay elements where we'd have an estimate of the elevation we anticipated, and they would design to that, set up their dredge plan for that, and they would stop at that

elevation, or when they had visible evidence.

MR. HARTMAN: But they wouldn't stop.

MR. GIBSON: They would stop if they hit it first, or they'd dredge until they encountered it.

MS. HOLLAND: Tim, is your card up again or still up?

MR. THOMPSON: Yes.

MR. FUGLEVAND: Excuse me, I want to clarify on the comment when we were at the site visit the 1st of October -- I can't remember where we were -- and the dredger was bringing up clay putting it into the barge, and I said, what is going on, why are you digging up clay. And the comment we got was we have to dig up at least six inches. We sat and watched. This was the 1st of October, we sat and saw them dig up clay. We still saw clay being dug up in October.

MR. GIBSON: What you were seeing, you saw a subsequent dredge

pass after we collected sediment cores and found PCBs in excess of the standard. The rule said go back again.

Yes, we made a six inch cut, and, no, it didn't make a lot of sense. But the standard directed us to do that.

MR. CONETTA: I think for the most part you hit clay, you stop. I think what happened in that particular instance there were two CUs where there were a couple of areas where there was some clay. We actually took core samples. And the core samples were sandy and not clay. And, actually, a level or two below that, a segment or two below that, we still didn't identify clay. So, ideally, it worked better, but the data said it wasn't a clay area. Obviously if you're starting to do that, something has to be done. We shouldn't hit those kinds of clay, but, unfortunately, that's what happened.

MS. HOLLAND: Victor, and then Tim.

MR. MAGAR: I have a few questions.

MS. HOLLAND: Remember to tell us who you want to answer first.

MR. MAGAR: Sure. I will start, I guess, with GE for this. I'm not sure who would answer best.

Are there estimates of what the deposition and increased exposure would be? We might call that changes in surface sediment chemistry in un-dredged areas. One of the things I'm challenged with when we talk, the Resuspension Standard are all in grams per day or kilograms per year, rates, which are a metric that I really don't have a context to understand. I don't know what 2000 grams or kilograms through the life cycle means in terms of a risk or exposure. But I do understand concentrations in water or changes in surface sediment concentrations. So is it your model,

GE, or EPA, but does the model have the ability to tell us that? And how do we get a better understanding of those risks?

MR. CONETTA: The models had have the ability to tell us that. They haven't been looked at in that way. As EPA indicated, they believe their model has a low bias in it, so that you wouldn't want to rely on its current predictions. But I think that's an important issue that would be looked at were the model corrected, in order to evaluate what the load means in terms of impacts on the water, et cetera.

MR. MAGAR: I would be in agreement. I don't know if there is an opportunity to do that, or if EPA thinks they should look at that, but it's very important in terms of overall changes that we are going to be seeing.

MR. GARVEY: The model that we run, as part of the standard, did look

at loads to the Lower River and looked at calculations as to when the loads were delivered to the Lower River by the emanation area with equal load delivered to the river by dredging, and the pay back point, the catch-up point, if you would.

It also looked at the impact of those loads to the Lower River, though it was not quantitatively used to set the 650 kilograms. In fact, in the Lower River during one of the scenarios, we actually delivered almost a 1000 kilograms to the Lower River and showed no impact beyond 10 years of the completion of dredging. So it didn't affect by the model run the long-term risks imposed on any fish in the Lower River.

MR. MAGAR: No impact in what it --

MR. GARVEY: Yes, fish tissue concentration.

MR. MAGAR: -- had in terms of fish sediment concentrations?

MR. GARVEY: Yes, this was a Lower River model, an adaptation of Kevin Farley's model of the Lower River. So the settling on the load, if you would, was not strictly risk or strictly engineering. It was a compromise between the two. I'm not sure in 2004 when you guys were sitting there if we set up things in front of you and said we needed to release 4 percent, that the panel at the time would say, yeah, that's about right. There were only a couple of numbers at the high end, but also numbers at the low end, so between risk and engineering.

MR. MAGAR: Does that estimate change now or has that judgment changed based on the changes and what we're seeing from the more realistic numbers in the last year's experience?

MR. GARVEY: I think it changes in two contexts. One, it seems the rates of release are on a scale of a percent or two in terms of engineering

controls. There is also the other factor that most loads run much, much higher than the model forecasts. So the pay back point is going to be, in terms of quantity, will be at a different point, not 650 kilograms. The pay back point will be very different, because it has already delivered 2000 kilograms more than we thought it would just over the last 10 years and that trajectory would continue out through the future. We need to evaluate what the trajectory might be and then examine the loads. But both factors have to come into play.

MS. HOLLAND: Victor, did you want the second part answered by GE?

MR. MAGAR: Yes.

MR. HAGGARD: What we did observe this year in terms of what the load and resuspension caused, in the Lower River there were samples we collected and there was a 40 or 60 percent increase in the smaller fish.

What we will see next year, we will get the data in the spring and see what it is downstream. One of the important things we hopefully emphasize and tried to make clear what we need to do, as Ed said, figure out what the new break-even point is. I think your question is what does break-even point mean if we hit, down river, concentration. The concentration should be straightforward, but we shouldn't forget the 40 miles upriver and the impact that has also. I think that is part of what John was saying, what do we know about what is being re-deposited in the 40 mile stretch? How is it going to impact in the recovery of the 40 mile stretch? I think that is something else we should consider in going forward.

MR. MAGAR: I agree. I didn't mean to exclude that. I was thinking more broadly in the river where it was being deposited, there was some

hypothesis. We didn't have information to go on what that information will be and what the impacts will be.

MR. BRIDGES: My next question relates to what Victor is talking about now.

MS. HOLLAND: If you want a segue, let me know your question is off of that. Remember to ask who you want to answer first.

MR. BRIDGES: We will go with EPA. I will be a bit more emphatic about this than my colleague who is being a bit deferential, I think.

This is critical in my mind, because what I heard in the last few days and what I have seen in the reports, there is a considerable amount of uncertainty of what this "load" is and now we are talking about potentially following EPA's proposal, tripling that load based on estimates of inventory of 2000 kilograms in the life of the project. I'm not sure --

I don't believe the panel can evaluate the technical sufficiency of Engineering Standards without some understanding of the implications of that load, either within the Thompson Island Pool as it is now, or downstream of that, that relates that load and the redistribution of either particulates associated with PCBs within the system and the consequent effect it has exposure to risk. I guess you can respond, please, GE first, and then EPA respond. And I would like to request that that is addressed in some detailed, quantitative fashion with evidence, data modelling results of what these relationships are in the final reports, because I'm not sure how I could make really useful comments or can reach conclusions about standards without understanding the implications of what you have been telling us for two days about the load and uncertainties in connection to the

load.

MR. HAGGARD: We fully support that. We will put as much information as we can in the report, and certainly between now and May, whatever additional analysis we can formulate available through the proper channels to get you 100% support of what you are suggesting.

MR. CONETTA: We don't disagree. It's critical. But we will try to walk you through what the standards envision, the export rate, because it was set at an export rate, the possibility of increasing mass, how that might affect it, actually, in the standard. So we will try to walk you through why it was set the way it was, why we think it was okay. Obviously in the report we will try to sort of -- obviously the MNA issue is off. There's a lot more going off to the river -- we're talking about a lot more load. I think we have shown with the fish issues -- I have to agree

with John that, you know, the levels in the Lower Hudson near Waterford are okay, but I also disagree on the baseline loads, because we just got data last Friday and the baseline loads are back to norm. But the river is actually going back to where it's supposed to be. The last impact to the Lower Hudson we have not only GE's data, but DOH did a substantial amount of data and collected at water, at water intake and had an infiltration surface water near Albany, and it showed no impact in regards to baseline loads to the river. Those are all pieces that need to be brought in. We understand it. It makes for the big mix. We will try to do that in the report.

MR. FUGLEVAND: One on the same issue we had, we saw a graph in one of the presentations that said, check surface sediments by 7 centimeters PCB, locations downstream of Phase 1 dredge areas.

MS. HOLLAND: A GE graph or who are you asking the question of?

MR. FUGLEVAND: GE graph, and I will ask John Connolly and ask EPA to respond. It shows a significant increase of the co-located cores, one case from 4 to 18, and another case, it goes from 3 to -- looks like 15 parts per million. So they kind of raise the issue about what's going on in that first 40 miles, not what's going down past the 3 percent losses. It's giving a sense there is a loss of more than 3 percent when you start to really bring in the increases in PCBs and surface sediments from 40 miles.

Then you also talk about setting a trap data with elevated PCBs of 50, and we know the elevated PCBs in a sediment trap doesn't reflect really what's on the bottom. I relay that as groundwork to a related question on, you know, GE has proposed to re-run the model as far as what is an acceptable amount of load, but I think

also the overall impact. Is there a way to re-run the model that looks at the impact within the 40 mile region, as well, and would that require some additional surface sampling to see what was the impact in Phase 1 within the first 40 miles with a visual surface sampling of co-located cores provide some additional insight to what is the impact of dredging to the increasing surface sediment concentrations possibly over the 40 mile reach.

I know it's a long, extended question. But it's asking about an issue, how to better understand the impact of dredging in the first 40 miles.

MR. CONNOLLY: Well, I think it's a great question, one of the biggest concerns for us that came out of Phase 1. And we don't fully understand it. We certainly have evidence that we have, in fact, sent PCBs downstream, and it was deposited

on the river bottom. There long-term impact is not clear. One of the things that we really need to see is what happens. For example, in the spring, we have a high flow event. Do we send a lot more PCB downstream than we had in the past high flow events, which will be a another signal we have high stuff at the surface. I think the models do have to address that. They do have to take the resuspension information that we obtained in Phase 1, as well as obtain some additional samples and try to make projections of what happens if we continue to dredge the way we are dredging, or the way we propose to dredge on the 40 miles of river on the Upper Hudson as well as potential impacts on the Lower Hudson.

MR. CONETTA: I will mention a couple of things, and I think some of the things that were brought up yesterday, as well, something that Todd had mentioned and he was trying to get through about the baseline and

background.

We, unfortunately, don't have a background on the sediment trap data. We don't know what the normal situation would be, because there is no background.

We heard there are some older samples from the nineties or late nineties that have 1 ppm. I think we have samples that show from the '98 time period, that some TSS samples around 25 ppm. So there is a disadvantage.

While the co-located cores are interesting, I don't know how much they can tell you about actual dredge release. There are substantial variabilities between co-located cores anyway. There are added influences from bathymetric surfaces; the river is very dynamic. We found that out. We lost at least 35,000 cubic yards of sediment in just the ten CUs that were dredged. That sediment has gone away. Where did it go? I'm not sure, but

it's not there. You know, and those are a couple of pieces, and Ed might want to add a few more.

MR. GARVEY: In terms of --

MR. CONETTA: Sorry, the other thing about high flow, it's interesting about high flow, but we do have actual information about high flow. But we do have data from 2006 regarding a high flow event. I don't know how you can compare the two, but we had levels as high as 260 nanograms per liter at Waterford. That's half the drinking water intake. How do you compare that to what you find at issue, I don't know. I think the only thing with can look at right now based on the levels, looks like they go back and forth. Any impact is probably minimal. If you look at the amount of actual contamination that is still there, and what you are depositing on top, it's minimal. I don't know how you make the stretch saying it's from the sediment trap distribution.

MR. GARVEY: I have a microphone.

I guess one other thing to put in context is this: While certainly the release of material downstream has the potential to contaminate a lot of areas, the river sort of dumps and transports hundreds of thousands kilograms of PCBs throughout its length over the last 40, 50 years. The areas, when we delineated river sections 2 and 3, GE spent a lot of time coring areas that defined what was above the thresholds we have concerns with above, as opposed to areas below. Despite the passage of time, the vast majority of areas of river section 2 and 3 were not particularly contaminated relative to the standard. Yes, some of the particles were disseminated in those areas, but if the river has taken 40 or 50 years and hasn't been able to develop a significance inventory or significant veneer of material, the

short-lived things will not create a 40 mile blanket of contamination. That said, we will have re-contamination in various targeted area of dredging. For the same reasons those areas are targeted, they will get probably get additional material, because that's where the fine grain sediment sets up. Is that a quantitative field, not, it is not. To your concern, one will wonder how far it will go and there are different ways to evaluate that, but I give that as a second thought.

MS. HOLLAND: Tim?

MR. MAGAR: Well, I had another question of Ed. Tim, are you going to comment on this?

MR. THOMPSON: No, I was not. I am always patient.

MS. HOLLAND: All right, Victor.

MR. MAGAR: Thank you.

I wanted to ask about the capping process and some of the decision-making behind the capping.

When I think of the dredging that had been referred to as the mass removal approach, and we were moving a lot of PCB mass in the system, probably the biggest work force in terms of actual risk reduction, is the cap material we were placing, and are we creating a clean sediment surface? There are two differences that perplex me, (1) capping with a single width which seems to be go against at least the last ten years of experience with cap placement approaches, and (2) why is there no sampling after the capping, which is to a relatively clean surface. So maybe you can help answer what could be a variety of questions from re-deposition, but also I think there were assumptions in the mixing of the cast which were very conservative assumptions, and I don't expect nearly that much mixing of the capping materials placed. I have to point who that is going to go to, so I will start with the EPA if you can

help answer that. I assume some of the decision making on capping is yours mand I will ask GE if they have a vision how this could be improved if it needed to be in your opinion.

MR. GARVEY: I guess I can start. The decisions to place -- we're not talking backfill right now but capping?

MR. MAGAR: Well, to be honest, where both are on one-foot of material, I'm not really distinguishing the two. You might have different surface and different armoring, but they're going to provide a lot of the same functionality. You can talk to that in terms of backfill or caps in terms how its placed and why there is no monitoring after the capping and the dredging passes have been done.

MR. GARVEY: The intention with the back full, I do -- and with respect to the standard, I think we need to distinguish between the two --

the basic requirement is if you call it a cap, it has to be maintained. If you call it backfill, it doesn't have to be maintained. I thought that is an important distinction in the ROD, that we were going to place backfill, but not require maintenance of it. It would form an isolating layer initially to be deposited on later, but also an expandable layer, if you will, something that if in the event of erosion you would provide a diluent for the material underneath it, so if it eroded through, you would already be eroding the cleaner materials around it, you would have that veneer, if you would, of concentrations of the surface once the backfill was eroded away. That was the original anticipation.

The placement of the cap on the other hand is spelled out by the Residual Performance Standard as to what's required with respect to different concentrations, averages and

individual core concentrations. In both instances, there was no requirement to test unless you went to a 20 acre average where you begin to backfill areas that were borderline of what we thought needed to be capped. So that's the basis for the logic. Have I answered the first part of your question?

MR. MAGAR: So -- and I understand that logic, but what you have given me are the various assumptions that entered into the Performance Standard. In my opinion, those assumptions were never tested in the last year.

MR. GARVEY: Right.

MR. MAGAR: The mixing rates and the things that you test.

MR. GARVEY: No, they were not. We don't have the data to test what you're suggesting. I suppose some of the information could be gathered by going back to the caps and backfill areas and sampling them. They are

still there.

MR. CONETTA: As part of the program that will be developed, I don't know if it's in target or non-target areas, but it's been five years since we put the scope together. We haven't worked on a plan yet. There are areas that we'll be looking at for sediment areas for testing. I don't remember if they are target or non-target areas.

MS. HOLLAND: Are you satisfied with their answer, Victor?

MR. MAGAR: Yes.

MR. HAGGARD: Let me just say as a matter of fact, we followed the existing procedure for determining when to place a cap. So if we hit certain levels or after we dredged so many times, we could use a cap. So we followed the rules in what we did in deciding if the cap was in compliance with the standard in all areas. There were non-data collected post dredging and capping on top of the surface.

And part of the logic there was we'd backfill what we were leaving behind, in variable concentrations to begin with. But you are right, there was no confirmation that the surface itself would be tested. The end assumption was what we would encounter that we'd see that, and it has, the capping has replaced them in multiple. By the time you get to the second lift, the material is clean. But, again, that was an assumption, and we need to confirm that was the case.

One thing the backfill and re-capping were very productive. Once we were able to begin, we were able to get a lot of material in the river quickly and accurately placed. That part of it from a productivity standpoint, Tim and the others, would like to, perhaps, have changes they would like to see from a, a location standpoint. But it was getting to be where we could say, yes, we'd put a cap on and backfill it in.

MR. MAGAR: You did it. Somebody said it was placed in 12 inch lifts.

MR. HAGGARD: The backfill. Just the backfill, but not the cap.

MR. KRUPPENBACHER: The backfill, there was a question yesterday about the backfill. It was placed in a 12 inch lift, obviously, multiple bucket passes to place a 12-inch layer. I'm not sure what you are looking at, a lift, if we placed it and surveyed it and placed it again. The typical process was with the larger, with the 385 equipment, the bucket did a sweep essentially over the area and did multiple sweeps over the area in order to get the full accumulation of the material in place on the river bottom. We only surveyed it at the end of the process of placing the material.

MR. FOX: When it did multiple sweeps, it did not move, it stayed in the same area?

MR. KRUPPENBACHER: Yes, that's correct. It took multiple buckets to get to the area, so it would work in the back to get the excavator.

MS. HOLLAND: We have 30 minutes for the last Q and A. I want to make sure you all get a chance to ask your questions. Try to ask multi-part questions, that's okay, then come back. Some of you haven't had a chance to ask anything yet.

I'm not giving you a hard time, Victor.

MR. FUGLEVAND: It's okay, you can give him a hard time.

MS. HOLLAND: Next is Tim and Rick and then Greg, okay?

MR. THOMPSON: I was waiting patiently, then the next thing I get is restrictions by you.

MS. HOLLAND: Sorry.

MR. THOMPSON: This is going to largely be directed at GE. I think one of the things that reached out to all of us on the panel is the issue of

characterization. At this point it seems like going forward you certainly have done a fair, a phenomenal amount of characterization. We heard proposed potentially one way of approaching it, "let's not go back and do proactive cores, do reactive cores, let's push the hole and see what we have there."

John, I think you said yesterday you guys were looking at possibly doing some proactive coring, recognizing, I'm sure, that the payback -- or a better characterization, even if you spend a million bucks, the problem would end up being a lot more. So I'm curious. After looking at the sample program, why did you end up with a Ross filter type core, which in our experience is one of the most inefficient samplers you could use?

Have you ever considered these fiber core pistons, geo probes, have you looked at those at all?

John has a smirk on his face.

MR. HAGGARD: It's just a smile. When we started, we took 50,000 samples on the river bottom. We looked at how can we best get this. We also did geo-tech work. We had core rigs up there, a huge, very slow process. We ended up having to make, to meet the requirement of the sampling. In our agreements we were required to process about 300 samples a day. To get 300 samples a day, we had three -- no, five coring rings out. If we tried to do the other types of techniques, we would never have made it.

We followed the agreements with the agency, and we then provided the data to the agency. They looked at it and said, let's go back, let's re-sample. So we would go back and re-core and took all the data, which we can provide to you -- they are very interesting reports, the dredge after the delineation reports, Phase 1 and

Phase 2, compiled the data, talked about core uncertainty. There was uncertainty recognized by the agency. The agency approved the cores.

Now, the question is do we -- should we go out and proactively versus reactively do a core? We can certainly get a core rig out there and take a sample or two in the area, but can we get 80 foot cores in most of the low areas? If you look at the standard, we try to address that uncertainty of the core depth by the way we want to approach the residuals in uncertain areas. If we go in and use the existing data to the cut line, recognizing we will then have to go back and do the samples and, hopefully, remove it, and going in, based on that we cut, to that, re-define that, and then we will put appropriate backfill and capping on. So if you follow that approach, we probably don't need to go up and do additional coring at this point. But

if there is some other approach that is more prescriptive, doesn't really address the residuals in that way, then coring may make some sense. We have to see what the other options might be.

MR. THOMPSON: I think we would like to see the SSAP core logs and confirmation field logs and core logs for just Phase 1. I don't want to go over all of it. I want to look through a --

MR. CONNOLLY: It's a huge about of information; it's a thousand cores.

MR. THOMPSON: Yes.

MR. CONNOLLY: We can provide you with that. We have 40 percent low confidence that equates to about 180 acres. So at eight cores an acre, we are talking about 1440 cores in those areas. Our ability to go back with the technology that would be slower, we can, at most, sample a very small area to inform us going forward. We are looking at that and looking at

alternate technologies, but we are really limited in our ability to re-characterize such a large area and keep on a schedule of getting Phase 2 up and running 24/7.

MR. FOX: You only have to do 2011 stuff this year and in subsequent years.

I understand what you are saying, I'm not trying to trivialize it. Can you do your sampling on a yearly basis?

And one question just to clarify, after you are done dredging will you characterize a full extent of non-native material after dredging, or go after the two foot cores?

MS. HOLLAND: Also Rick, we haven't given EPA a chance to respond to Tim's question. Could you hold that one and repeat it later, because I'm trying to be fair here.

EPA did you have a response?

MR. CONETTA: Yes. Some additional thoughts on our end in

terms of the amount of cores that are required, it was a monumental effort by GE; I understand that. I don't know how many we required a day.

MR. CONNOLLY: 60.

MR. CONETTA: But it was a metric to get where we need to be for a design. Uncertainty was looked at, uncertainties, but were not implied. We had a, quite a large disparity in terms of the uncertainties, I think, and we'll get into that further.

A decision was made at this point and arguments made that they were 50 percent more likely to get clean, as dirty, material. So conscious of costs, conscious of taking out material, I think the uncertainty issue was not missed and certainly addressed. I think what we have seen in Phase 1, that had some dramatic impact. I don't believe in any case we dredged clean material. I think in a lot of cases we had to dredge a lot more dirty material, PCB

contaminated material.

Some nomenclature issues that get into the nitty-gritty of the standards, while there are issues about dredging clean material, I will remind you those sediment cores and the results, very few of them, if any, were non-detect. A lot were try plus PCBs, some as high as five or ten residuals, total PCBs, which could have been left, depending on what the ratio was for backfilling or capping of cores; we took an average. So to say they are "clean" I think you have to look at a much closer -- one of them, one of the suggestions from yesterday on John's table at taking out about 12 inches of clean material, that's the way I read that table. I don't think we ever got that. But part of the metric on that was changed as well. The metric was what was the tri plus surface, and what was the total PCB? The metric in the tape will change to what's your NPA, and

that's a different standard as to which areas should you be dredging. I don't know that is an applicable evaluation.

We can look further, but that's a little bit of changing the goals. They have to look the same. We need to look at certain points to make our points clearer. I think we are confident in looking at our cores, our level 1-A cores on how much deeper you have to go. I think it was a minimum of 6 inches in 75 percent of the cores, a minimum of 12 inches in 50 percent of the cores, and 40 percent or 30 where you were greater than 12.

So what we did not recommend and what we'll have to do a better job of in the actual cores, the non-complete cores. But there were other issues with the non-complete cores that I think have to be addressed.

The debris fields, we made a recommendation on what we need to do. We need to get to the bottom. If it's

bedrock, that's not a non-complete core, that's not an issue because you will hit bedrock and stop. So even if you set the DOC deeper, it's okay. If you hit clay in these areas, that's another stopping mechanism. But John mentioned yesterday they had up to 20 inches of additional material there, and that needs to be factored into somehow. Because at the end of the day, our project needs to be productive in the amount of PCBs we take out, efficiently. And that means taking them out quickly, with fewer passes -- not less passes, and I'm not trying to trivialize -- it's an immense project, I understand that -- but if there was no load standard, I think you could cull away -- and that's not the right word, go away and take away, go away and take away, go away and take away.

MS. HOLLAND: We have more questions?

MR. CONETTA: I'm sorry, can I

just answer one other question about the what was mentioned, the debris?

MS. HOLLAND: Very briefly, because we are getting short of time and there are a lot of questions.

MR. CONETTA: The one by one is not what we're recommending.

And just as a correction, you know, I think John understands that. What we were asking for is the data-metric surveys, one by one grids. We have different areas that have different metrics for evaluation. You cannot evaluate them on a 10 by 10 foot grid. Also the one foot by one foot grid gives us better surface to evaluate what was going on. We want to get away from the 10 by 10 grid. I don't think we are happy with it, and I don't think they were either.

MS. HOLLAND: We have a few other cards up. If you need come back to some of this, you can keep your card up.

We will go to Rick and Greg,

and, Victor, yours is back up again.

MR. FOX: I will switch it up again. In the first period you were looking at the Engineering Performance Standards and throughout this session, we've talked about the intensive level of data collection. What I haven't really heard through part of this is there is a recommendation in the reports to reduce the data collection activities to data used to make informed decisions and not try get out of study mode, that type of thing.

MS. HOLLAND: Who would do you want to answer first?

MR. FOX: I would like John Connolly or John Haggard or Bob.

MS. HOLLAND: Keep your answers as brief as you can. I want to make sure the panel gets to ask that they need to.

MR. GIBSON: We learned a lot of things in Phase 1, and there are a lot of opportunities to streamline a lot of things. EPA made some

recommendations to that effect. The near-field program was not very helpful in informing us in terms of PCB releases associated in terms of dredging. We think that can be at least scaled back, if not eliminated.

The monitoring for other parameters, metals, we learned that metal releases are not an issue. That data was not effective at any level for the full season. What else, the far-field program worked very well. The monitoring techniques we used earlier in the season showed us a promise and allowed us to show a result in eight hours. That is good as well.

Phase 1, you are right, was an extensive research project from our perspective. We collected a huge amount of data. Now that we have the data, I believe that we can streamline what we have.

MR. CONETTA: We agree with Bob there are definitely areas in the

far-field stations. I think those need to be where they are. For near field, there are other things we can look at, other things to inform us going forward, as well, but not necessarily the system that is in place. We need to make a lot of changes to make things easier and less cumbersome. There are a lot of people -- there are certain areas we would like to have more information on, certainly going for releases, obviously trying to find out about oil sheens and get a handle on boat tracking. We have some of that that we can anecdotally look at. There will be a pretty significant piece of boat tracking that we had. Maybe with less boat vessels, optimization -- again, I'm not trying to trivialize, but you have standards to meet for a reason. And 90 boats is nice, you need 90 boats, but it causes a lot of resuspension. Those are things we have to look at, because everything

affects the water.

MS. HOLLAND: Greg.

MR. HARTMAN: This is a design question for Ed Garvey and Bob Gibson. You know, you had an amazing mix of dredges, one yard, two to five yard dredges. In the last few days of discussion, it was based on the depth; you had to have a smaller dredge in the shallower areas. You decided to dredge a short shallow reach to allow a larger dredge in the scow operation very late in the season, in September or October. Are there other locations that limit the dredging, but enhance artery equipment access for the contractor? The question is two-fold. The first question is was that deepening-effect cost in the project effective, and the second is, is there an option to consider the same action that would remain in the project that would enhance, improve the contractor's capability to complete the project?

MR. CONETTA: There is access dredging recommended in the Standard. It's for a reason, to help assist us in getting the productivity rates and dredge done. There are areas in 2 that is needed, not necessarily just to dredge in the canal or the channel, but there are areas delineated that will require additional access dredging to get in there to improve the dredging.

MR. GARVEY: River section 2, the landlocked section of the river where the channel does not go through the level, because it's landlocked, that looks like it will have shallow areas.

MR. HARTMAN: Was the dredging effective?

MR. CONETTA: I think for looking at the access for CU-1, it allowed you to take out more material. Obviously, you have to weigh it with low standard residuals -- residuals are a different animal, but for the

low standards and whatnot, the production rates can get heavy in the area for contamination. But absolutely I think it's important that if this were to succeed, you need to have access dredging.

MS. HOLLAND: GE?

MR. GIBSON: Specifically CU-1, the reason we did that, we planned it based on the dredge design based on 15,000 cubic yards. Looking at the dredge plan and sequencing, we felt we could get the dredging done within the period in the design. When we found the deeper contamination and started dealing with the scheduling issues getting toward the end of the season, we needed to get the material out of there quicker. That is the reason we did the access dredging late in the season.

Certainly in Phase 2, if access dredging is something we need to look at to get the job done, we will do it within the parameters. But to

speculate right now based on not knowing what the standards will be, I can't give you a direct answer there.

MR. HARTMAN: Thank you.

MS. HOLLAND: Paul?

MR. FUGLEVAND: My question's mainly a comment on your final report, and the charge we have of the panel that everybody received, one of the charges is if GE -- EPA or GE proposed modifying the standard, and we addressed that, so my requests in your final report is to be explicit in your proposals rather than saying we "might" do this or that. Explicit, as if we might build a house, and I say well, are you talking about a 2400 square foot house? The only way to evaluate a change is to be specific. I know it's a challenge to you, but to the degree you can, we need specific proposals for us to fulfill the requirements of the panel.

MS. HOLLAND: Thanks.

Todd?

MR. BRIDGES: I want to briefly revisit -- maybe I will point to the report again, but if you wish to respond, EPA, you can. The PCB oil obviously is a matter of concern. I call it a "sheen" and a sheen is an indicator. I find no way to relate to quantity or release, where it went, how much of it there was. I just don't know. What will you do about that? I'm assuming there is some reasonable expectation that that can be repeated, you know, in Phase 2. Maybe there was evidence about that. This gets, kind of gets back to my concern about release and residuals. Residuals, not in the dredged prism, but outside. If you are releasing particles or oil or pixy dust as a result of your dredging activities, and it goes outside of the dredge prism, that is a matter of concern. And it seems to me, for example, the Residuals Standard as constructed now appears not to even recognize anything

that follows outside of the dredge prism as a residual.

MS. HOLLAND: Who do you want to answer first?

MR. BRIDGES: EPA. I mean, I don't expect answers to that now. I'm more interested in from the panel's point of view, in what would the report say with regard to how you get to address this problem. Now there is only speculation.

MR. CONETTA: It's a very good question. We think it's the tip of the iceberg, obviously. We can see what is on the surface, we don't know what's underneath the surface. We have visual observation of the sheen coming up and going back down. I think we need to evaluate how best to proceed and deal with it. They did have some response, the contractors on board, and I think John mentioned that was the purpose for them to be there. The unfortunate thing, while they were there, they had to deal with three

different areas and it was hard to get a handle on all three areas at the same time. When you had a sheen reported, they weren't necessarily in that area when it blooms up, whatnot. That was done towards the end a little bit better, but did we fully collect and deal with the issue? No. Obviously if anyone has a recommendation on how to deal with it, we would love to hear it. When we look at some of the water results down at Thompson Island where you have levels of 200 to 600, in one sample, part of us think, from at least this end, part of that may be due to oil sheens or oil products or droplets in the water sample. We don't know. That is supposition. That may be part of another piece of monitoring as we go forth in Phase 2, and what action mechanisms can be implemented to control it? We probably will see it but it's probably in the more highly contaminated areas, not necessarily

the lower contaminated areas so maybe we can target those areas, and just be especially careful.

MR. MAGAR: Just a quick follow-up question on that. You know nothing from the sediment that was actually removed? There was no oil nodules, there's no evidence? Did you inspect the actual sediment from that area?

MR. CONETTA: I believe from the SSAP course that there was some indication, but nothing like we have seen.

MS. HOLLAND: You need to give GE a chance to respond to the original question.

MR. HAGGARD: I don't like to be quite as fatalistic as EPA. I mean we do have objective evidence that is important to the use of the machines. In this, we didn't have a chance to go through in terms of where we monitor downstream of Thompson Island Dam. When we are dredging upstream, the

material does go downstream, and then goes over and runs up the river dam before we sample. So what we have at the base of the dam are a huge mixture of things. Yes, there are variabilities we see in the samples. The cause of the variability, the EPA is speculating, could be oil. You know what, we're very close to where some of the dredging occurred, and we had this mixing effect. The fact that data, pre-produce data, is very good, indicates it may be a lateral mixing of what is hugging the shore. So we could see variability.

I think what's important is we got a good -- we know what the losses were, whether or not they're caused by the tugs you see coming up, each time we hit the dredger bottom or a spud moving up or a tug moving around, or some sheen coming when we are dredging high levels of material, what we're measuring are 3 or 4 percent levels. We did an analysis at looking at the

sheen and are they contributing? Yes, but a small percentage. Can we try to do more in terms of collection? We've done a lot already. These are some odd sheens that come and go at different places. So not sure there is much more we can do there, other than do studies. I think we have a good sense of what the overall losses were. I think the comment you made, it's indicative of -- the sheens are indicators of where we are dredging and the high concentration material and the moving of fairly high masses of PCB.

MR. BRIDGES: Just a brief follow-up, you maybe feel like you have confidence at Thompson Island Dam, but there's as much as seven miles between the dredging and that monitoring collection point where you -- I mean, what's going on there? That's a lot of river.

MS. HOLLAND: You have about four minutes left.

MR. HAGGARD: I absolutely agree that the standard doesn't adequately address what happens to the material between where you dredge and where you monitor, clear evidence. Material is falling out and depositing, whether or not it's in a transitory way or it's going to be there longer term. We don't know yet, but the standard doesn't clearly address that, and we think it should.

MS. HOLLAND: Greg, do you still have a question? No, okay.

Any follow-up? We have three minutes left. Let this be our last one, I think.

MR. SCHROEDER: My question is about resuspension controls. And at this point, you know, you try a lot of things, have done a lot of things. One particular thing that hasn't been tried that would address a load issue is the use of carbons, perhaps carbon curtains. And that may also address, help address, oil losses, as well.

Has any consideration been made in this regard?

MS. HOLLAND: Who do you want to go first?

MR. SCHROEDER: I'd like to hear from GE first.

MR. CONNOLLY: Well, we're not aware of an application of carbon curtains in a project anywhere close to this size. We know it's a concept, we know some companies have developed prototypes for this, but we don't know if it's been applied anywhere. We don't view Phase 2 as sort of a research exercise.

We have some real concerns about, you know, resistance of flow through something that's impregnated with carbon and what that means for the stability of long-term life for such a curtain. So I guess the short answer is that it's a concept, but we have no sense that we could apply it, and that it would be effective.

MR. CONETTA: I think you

mentioned one of the things that we're trying to recommend or at least have evaluated, I don't think we need it for the entire area of Phase 2. I think in limited areas it may be very helpful, especially in high velocity areas. There may be other situations or certain control measures that can be taken. Again, it's all supposition. We don't know. Sheet piles north, and filters south, something, a combination of things. These are things recommended and certainly things going back and forth.

One of the things John mentioned about flow, and this is getting lost in a lot of the load conversations, and whatnot. This year was the second or third highest flow year, well above the median of most any other year. I'm not sure if this is the BMP period or more, but it was a highly high flow year.

Taking that on top of a rock dike on the east side of Rogers Island

makes it a double whammy on the west side of Rogers Island. Those are considerations that aren't really looked at. We are looking at velocity profiles, but the situation is much different.

The other thing about where we've been this year is, unfortunately or unfortunately, we've been in some of the most difficult areas to sample trash. To sort of push that out in Phase 2 isn't totally, necessarily fair. I think we have to take a better look at Phase 2. Certain things we will encounter, but the levels won't be so high. We wouldn't have another rock dike affect flow rates, and obviously wouldn't have the amount of debris we've had at certain areas of CUs, so those are a couple of things.

MS. HOLLAND: Thanks, everybody.

We need to move onto our lunch break. I want to remind anyone who wants to make public comment, you need

to sign up immediately when we break. We're coming back at two o'clock. We have a one hour window of opportunity for public comment. Thank you.

(At this time a luncheon recess was taken.)

MS. HOLLAND: Everyone come on and take your seats, and we will get going. Our next segment of the agenda is our public comment period for this afternoon. So we need to gather our panelists. Hopefully you all picked up a copy of the ground rules out front. I went over them this morning. The way it works, we take you in the order in which you signed up, although I have a caveat, a question about that, in a minute. Then we are dividing the time available. So we had seven people sign up, and that works up to eight minutes for each person. We had one other person who came in late today. If there was extra time, he would like to make a comment, as well. We will see if

there is enough time in the hour.

So of the seven of you who signed up, we have one gentlemen Tom Bronson, he has a flight, he has to leave at 2:30. Does anyone have a problem if Tom Bronson goes first? I don't see any objection. Okay. We have eight minutes apiece.

The panel will not address any questions. If you raise questions, they will be in the public record, but they can't address them.

We will start with Tom Bronson. I would like if you queue up next. John Jermano, please be ready to go next. You have up to eight minutes. Steve will help me keep track of time.

MR. BRONSON: Thanks for letting me go first. My name is Tom Bronson of the National Oceanic and Atmospheric Administration. We are actually trustees for an organization which actually includes the Department of the Interior.

New York State NOAA would like

to raise a concern regarding GE's proposed changes to the Residual and Resuspension Performance Standards. GE proposal included a reduction in PCB mass removal and an increase in traffic, and this is a change to the remedy. As noted by the trustees yesterday, the river is much more contaminated and will remain much more contaminated than the ROD envisioned. GE's proposal to dredge less will result in even greater levels of PCB left behind. Regarding capping in the ROD, EPA affirmed that this is a dredging remedy and rejected capping as less protective and not permanent. Phase 1 resulted in 36 percent of dredged areas being capped when only 5 percent was envisioned. More capping will also result in less habitat restoration. Combined with the proposal of less dredging and more capping, this will even prolong, further prolong, the recovery of the river.

In conclusion, the trustees hear in GE's proposal a combination of adjustments to the Performance Standard and a change to the remedy. While we are not opposed to reasonable adjustments to the Performance Standards, such changes should not be used to change the remedy.

Thank you.

MS. HOLLAND: Anyone who wants to turn in your written remarks, please do so to Steve in the back, who has his hand raised by the end of the meeting today if you have more remarks than you said. Okay.

Next we will have John Jermano, then Manna Jo Greene.

MR. JERMANO: Thank you. My name John Jermano and I am representing the Canal Society of New York. I wish to read a letter from the society signed by our president and dated 16 February 2010.

To Whom It May Concern: The Champlain Canal is a crucial link in

New York State's historic canal system, a system that made New York not only the Empire State by the Canal State, as well, because New York is the only state in the union with an operating canal network that stemmed directly from ancestors originally completed in 1825 or shortly thereafter, and from that time onward have operated continuously.

New York can further boast that it has the longest artificial inland navigation of any state in the union. In addition to the canal network's robust engineering history and monumental economic achievements, it is the only all-American water route, out from the Great Lakes to the Atlantic Ocean at New York City and all within the solitary confines of our state. Therefore, the importance of the canal to our economic, cultural and quality of life vitality cannot be understated.

But the story and significance

of the Champlain Canal is not about the past. It's about the future, and the success of that future is intimately and most profoundly rooted in bringing the waterway back to its original early 20th Century design dimensions. Without dredging, the waterway cannot be brought back and eventually it will fade into oblivion.

The navigational channel in the Champlain Canal requires periodic maintenance dredging to maintain a 12 foot water depth as specified in the New York State regulations. The New York State Department of Transportation regularly performed such dredging in the Champlain Canal until 1980. At that time the cost of maintenance dredging became prohibitively expensive due to the need to dispose of PCB contaminated sediment. This predicament continues to this day, and the New York State Canal Corporation is unable to restore the channel depth due to the cost

involved.

Since the Champlain Canal has numerous areas with restricted navigation depth as a result of PCB contamination, the Canal Society of New York State recommends that the navigational channel be dredged by GE concurrently with the next phase of environmental dredging. In addition to restoring navigation, this action will insure a 12 foot channel for the multi-year environmental dredging project and more fully utilize the existing dredging processing plant.

Very best regards, Thomas X. Grasso, President, Canal Society of New York State.

Thank you. May I give you a copy?

MS. HOLLAND: Thank you very much. Ms. Greene, and next is Mr. Tom Kryzak.

MS. GREENE: Again, we're going to prepare more extensive comments based on everything we heard today,

but a couple of important points. One is that there is an inter-relationship between resuspension residuals and productivity. The important thing is the minimizing of resuspension and minimizing the amount of residual PCBs left in the river should not be driven by productivity. It should be the other way around, the emphasis being on the high quality cleanup.

I said this yesterday, but I want to reiterate, the result should not be compromised. We have no objection to taking another year, as long as in the interim all of the steps that have been suggested today about a proactive planning, additional testing, sending divers down doing coring, borings, whatever you have to do ahead of time, whatever EPA and GE have to do ahead of time, to get a better picture so the actual dredging process is not delayed by unnecessary surprises. I think that some of the surprises that we found in Phase 1,

that were discovered in Phase 1, should inform a very proactive investigation. I think that is what -- I have a very strong objection to delaying the remediation of the rest of Phase 1, those additional eight sites, the eight CUs that were not previously dredged for another year to do a Peer Review process, which a considerable amount would be done by June. We felt it was a wasted season. But this season will not be wasted if it's used for the resumption of dredging in Phase 2.

I want to talk a little bit about load. Here I want to stress that we want to minimize resuspension, but what is left in the river will eventually move downstream and may even move down into the Lower Hudson. What I used to say when I was trying to explain to people, there is a cost benefit that, you know, if there is this much PCB in the river, 60 percent will be remediated, there will be a

little bit of cost in terms of resuspension to get the 60 percent out. That is when we were trying to get the ROD passed.

Well, now we found out there is not just this much, but there is probably this much PCBs in the river. Again, what is the cost benefit? I don't want to see load increases to the Lower Hudson. I don't want to see PCBs disrupted, disturbed, end up in an area not being remediated, whether it's in the Upper or the Lower Hudson.

So I want -- if we can hold the load to whatever it currently is, a fixed load would be fine. But then we've got to address it with, you know, with the mechanical, operational and appropriate sampling, pre-sampling, so that we go in and do a really efficient job. I also think that we need to be more -- I feel a little dij` vu -- because we think the Performance Standards are very reactive and we wanted them to be more

proactive in terms of protecting each work area and minimizing resuspension. So if some of the future planning can address not trying to address a problem after it happened, but address a work area so that if a problem does occur, it's contained. And I think that might be the key points that I wanted to raise at this point, and I think your questions were really relevant. I guess I also want to say that I never got the sense when EPA was raising issues that they were being blameful. I think they were simply raising issues that needed to be addressed and vice versa. I think a lot of really good information was brought forward.

Oh, I do have one more thing. Just put on your eco-imagination for a minute. Let's pretend instead of General Electric having to pay the bill, which they do, for the contamination that is in the river, that they were being paid to do the

best possible job, that is the most PCBs they could get out with the least resuspension and the least impact on the load. That brilliance would then have an incentive. But what's happened in this process, they have their interest to keep their costs down and the environmental community and others want to get the best possible reduction of contamination of the river for the environment, for human health and safety. So there is this rift going on where there is an apparent conflict. In an ideal world, we would sit around brainstorming on how to get the best possible outcome, and this would be going on. That is your job, to take the best of what we all said and synthesize that into recommendations that will achieve the most cost-effective, most efficient remediation, with the least exposure. It's a great challenge. I thank you for undertaking it.

MS. HOLLAND: Thank you. Next

is Tom Kryzak and then George Hodgson.

MR. KRYZAK: My name is Tom Kryzak and I would like to provide information from a project I designed and completed for the Department of Energy for consideration in their Peer Review process. This was new patent sediment removal technology used at Knoll's Power Lab in Niskayuna last year and it was for the removal of sediments, muscles, Zebra muscle shells, et cetera, extending from the channel to the Mohawk River. What it is, it's basically a vacuum suction process. We believe it could be used to remove the residual dredging in the third, fourth, fifth pass. I have a brief paper on this and I will follow it up with more information.

MS. HOLLAND: Do you want to submit the paper today?

MR. KRYZAK: Yes.

MS. HOLLAND: Thank you very much.

George Hodgson.

MR. HODGSON: Good afternoon. My name is George Hodgson and I'm the Director of the Saratoga County Environmental Management Council, SCEMC. The council is an environmental citizen advisory group advising the Board of Supervisors. I have been employed with the County in my present capacity for the past 36 years, although it seems hard to believe. I was saying this the other day; the council had been involved in reviewing the science of the Hudson River PCBs, first in the assessment and then in reassessment for 32 of the 36 years I have been employed. That boggles my mind. This has been going on and on and on.

The Council is most concerned with the Performance Standards of this project and their relationship to the degradation of the Hudson River resources, as well as the quality of life serving the County's riverside residences.

Of utmost importance to Saratoga County and the SCEMC is the resuspension dynamics of this project and the syntax of two of our down river sources, public drinking water supplies located in the Town of Halfmoon and the Town of Waterford -- actually the Village of Waterford. Between the two of those public treatment water facilities, over 60,000 people are served. So it's not a small issue to Saratoga County and obviously the Hudson is, as it forms the eastern border of Saratoga County.

I would like to thank the peer reviewers for their dedicated efforts in the last two days in increasing the understanding of the Super Fund Mediation Project to get their arms around it and to offer valuable guidance to EPA and GE to meet the 2002 ROD requirements in a manner that has the least impact to an important resource and the various user public.

Following are the SCEMC comments

prepared by David Adams, member-at-large, Chief Technical Researcher for SCEMC. Unfortunately, David is in Colorado now and he is unable to be here. I'm sure he is with you in spirit. I have incorporated into this some of my observations based on my attendance at the Peer Review meeting for the past two days, which are so noted. These are Dave's comments below on the information presented in the draft reports by EPA and GE.

"Although time did not permit an intensive review of these lengthy reports, some major areas of concern were identified and are presented in this paper:

1. Mass Load Going Past Waterford.

The EPA and GE disagree on the increased PCB load passing Waterford as a result of the Phase 1 dredging. While it is important that a sincere effort be made by both parties to

resolve their differences, because this load is what determines how the dredging will impact the Lower Hudson River, what is significant is that both GE and EPA calculate a greater load than the goal for phase 1.

EPA, in their report, maintains that the goal for the PCB load should be adjusted upward as more material was dredged than the goal for phase 1.

However, the GE report states that in Phase 1, 20 percent less PCB was removed than the target goal of 20,000 kilograms. Because the goal is related to PCB mass, not total mass, it would seem the target load at Waterford should be reduced rather than increased as suggested in the EPA report.

Of greater concern, however, is the contention that the goal for mass load going to the Lower Hudson River should be increased, because there is more PCB to be removed than originally estimated in the setting for the

Resuspension Standard. A key sentence is the last sentence in italics at the bottom of pages 1-27 of the EPA report:

"The acceptable rate of PCB loss and the acceptable water column concentrations are not expected to change as the result of additional data, because these criteria are based on modeling of future impacts and associated risk."

In the first paragraph on page 37, it is stated that the ROD gives the total allowable mass that could be transported downstream as 650 kg, which happens to be about 1 percent of the ROD estimated 70,000 kg of PCB to be removed. Thus the 1 percent that EPA is putting forth as a standard is simply an artifact of the PCB mass estimated to be removed in the ROD. To carry this point to the absurd, suppose it was found that the PCB mass to be removed was 10 times greater than 70,000 kg. Would EPA then say

that 6500 kg should be allowed to pass to the Lower Hudson River? If EPA wants to allow more resuspension and resulting increased load to the Lower Hudson River, modeling should be done to justify the increased load.

2. Deposition in Non-Dredge Areas.

Deposition of non-dredge areas of equal, if not greater concern, is the find by GE that PCB is being deposited in areas not scheduled for dredging at concentrations well in excess of the one mg/kg concentration set as the allowed surface concentration in dredged areas.

While based on meager data, the fact that such deposition is occurring must be addressed and resolved before dredging is resumed. This deposition is obviously a result of not achieving the resuspension levels expected from the dredging. It is not clear how the resuspension can be reduced sufficiently using the pre-dredging

techniques. The arguments in the EPA report suggesting that controls on oil sheen and water loss from buckets can give major improvements are questionable given the results of the GE calculations of the total contribution of these sources to the load at Waterford. While again only meager data are available, at present they are the only data.

My comment, based on being here, the EMC is very concerned with the PCB resuspension issue, and we have repeatedly recommended near-field PCB monitoring to help determine the extent of dredged resuspension immediately downstream of the dredging areas. And I note several members of the Peer Review panel expressed concern in yesterday's dialog. I personally found it more than a little disconcerting, Ed Garvey's statement yesterday morning, that near-field PCB monitoring frequency should be reduced in Phase 2. It's totally unacceptable

that dredging Certification Units remain open for a one-and-a-half to three-month period, thereby exposing high levels of sediment-based PCB to both natural and project-related resuspension factors.

3. Residual Standard.

It is obvious that the procedures used --

MS. HOLLAND: One minute.

MR. HODGSON: It is obvious that the procedures used in Phase 1 for determining compliance with the Residual Standard cannot be used for Phase 2. The present procedures are major obstacles to achieving the desired dredging rate. I won't go into that any more.

4. Water Supply.

The water supply is more at issue with the amount of resuspension occurring, while not so far causing many violations of the drinking water standards, it is dangerous to assume that in the future all sampling and

sample analysis will proceed without errors or in a timely way.

We are recommending that Troy water be supplied to the municipalities using the Half Moon and Waterford facilities.

My closing comments, based upon the excellent presentations by both GE and EPA and the Peer Review questions posed along the way, it seems to me the overriding project is to reach the 2002 ROD mass removal requirement. It is the SCEMC's opinion that this should be accomplished in the shortest possible time frame in the least environmentally and publicly impacting manner. We believe it is wrong to allow increased amounts of PCBs to go into the Lower Hudson. If EPA wants to allow more resuspension and the resulting increased load to the Lower Hudson River, modeling should be done to justify the increased load and it should not be arbitrarily assigned a value of 1 percent of the dredged PCB

inventory.

MS. HOLLAND: You need to wrap up.

MR. HODGSON: One other comment: Several people expressed interest in navigation dredging. The County has been on record with a resolution that needs to be addressed. It's an interesting ROD, it needs to be done, and it's part of the remediation.

MS. HOLLAND: Thank you.

MR. HODGSON: Thank you very much. I want to thank the Peer Review panel. This is the first Peer Review panel I ever been involved with, and you guys, by far, are much more involved with your questioning. Thank you.

MS. HOLLAND: Thank you.

Next, we have Wayne Richter and Kevin Ferrara. Sorry if I can't read your writing. You have eight minutes each.

MR. RICHTER: My name is Wayne Richter and I'm with the Division of

Fish, Wildlife and Marine Resources of the New York State Department of Environmental Conservation.

I want to address the specific issue, which is PCB levels in fish. I want to address that because I think GE gave you an account that's incorrect and excessively dire in its depiction of the facts. Let me remind you that GE said levels were up significantly in all four sections, including the Stillwater and Albany areas. I think they gave numbers in the areas of 60 percent and 40 percent. And they did that using comparison of data from 2007 and 2008 from the baseline monitoring program against the 2009 data talking about the fish, the small Pumpkinseed and small Forage Fish. My figures are much different and show a different picture. That's because of five years of baseline monitoring program data, which looked at fish between 2004 through 2009. GE didn't justify why

they used only two years of data and ignored the other 60 percent of the data. There is a problem here, because it turns out there is a lot of variability from year to year.

If you look at the five years, you see what looks like a bit of a declining trend. You can actual model that, but the salient feature is the high variability. It is far greater than any trend. And one of the things I looked at was fitting a model to these data. You can't fit the progression model to the these data, because they're so variable. You get problems. The data essentially can't predict itself in a defensive model. By choosing just the last two years of the data, what GE essentially is doing is modeling over-fitting. That is a bad statistical practice. It leads to bad conclusions.

I looked at the full five years of baseline modelling data, and I got a different conclusion. When I

compared data, I found levels went up significantly at Thompson Island, at the Northumberland-Fort Miller area, roughly one and a half times. They went up, but in the Stillwater section and the Albany section, there was no significant difference. There was a small change, but, again, not significant, not even close to significant.

One of the questions you have to ask when looking at these data is what is the causal relationship? Can I actually say, okay, I saw a change between the baseline period, and once they started dredging. Can I say that was due to dredging? One of the ways of doing that is to look at the 2009 data, see how well does it fit the pattern, the variable pattern 2004 to the 2009 data. When you look at the Thompson Island Pool where the dredging took place, the levels in 2009 are well above. There is clearly a change in the pattern. There is

disruption. You got a pretty good conclusion that dredging had an effect.

When you look at the Northumberland-Fort Miller data, they are kind of at the high end, probably, but not certain because it's plausible they are part of the same pattern. When you look at Stillwater and look at Albany, the 2009 data fits right in the middle of the 2004 through 2008 data. They are just well within that range.

So the conclusion here from my analysis is that dredging certainly affected local levels at the Thompson Island Pool, but the data provides no support for any kind of conclusion that dredging adversely affected PCB levels in fish more than a few miles downstream. Just to give you an idea of what type of variability you actually get in the system monitoring the area at the feeder dam to the canal, it's well upstream of GE's

plant. It turns out the Forage Fish, looking at the median, because it's a lot of non-detect, the 2009 level was significantly greater than the 2004-2008 level. And, you know, dredging didn't work upstream in terms of its effect, so you have to take a look cognitively at the variability and be careful in your conclusions.

Thank you.

MS. HOLLAND: Next is Kevin Farrar.

MR. FARRAR: Hello, my name is Kevin Farrar and I'm representing the New York State Department of Environmental Conservation. As you know the state had been involved in the mediation of the PCBs in the Hudson River since the problem had been discovered. We participated in the entire reassessment process throughout the nineties and the development of the Record of Decision. We were directly involved, along with EPA, in the development and design of

the Phase 1 Project.

Over the course of Phase 1, the state had some oversight of the project, and we have several points to raise with you for you to consider.

First, we believe, the state believes, that the overall benefit associated with the removal of an estimated 20 tons of PCB from the river greatly outweighs the short-term impacts associated with the work. The state recognizes that Phase 1 was conceived of as an opportunity to not only perform a significant portion of the dredging work, but to also allow for lessons learned during Phase 1 to assist in guiding decisions on changes to project design, to improve project quality, better meet the human health and environmental risk reduction objectives in the Record of Decision, and to reduce negative project impacts. The state will continue to work with EPA to accomplish these goals and will continue to evaluate

the results of the Phase 1 efforts and to work with EPA in developing the project design between now and the start of Phase 2.

We recommend that the panel look at the environmental data gathered during Phase 1 in its historical context. PCB concentrations observed in the water column were similar to those observed in the early 1990's when releases from the GE Hudson Falls plant site were occurring. The state had expected as a result of Phase 1 work to see increases in the water column and biota PCB. The state also expects to see the water column and biota PCBs decline over time, just as was observed as the releases from the GE Hudson Falls plant site were abated. The state also recommends that the panel consider the high variability in the environmental data over the period of record when looking at phase 1 data.

The state has developed for EPA

a report summarizing the issues which were identified during the state's extensive oversight. The report will be made available to the panel. This report includes both the issues which impacted the ability of the project work to meet the standards, and recommendations you address these issues, which the state believes will both better allow the project to meet the standards and improve overall project quality.

The state believes that an important element of the panel deliberations is to identify the potential changes in project operations that the panel believes are necessary and/or appropriate to allow the project work to meet the standards. The state, in its report to EPA, makes a number of specific recommendations for design changes as well as changes to the standards to help improve the ability of the project work to meet the standards and

to improve the overall project quality. These recommendations will be provided to the panel by EPA.

The consequences of "not meeting the performance standards" was discussed this morning. The state believes that if the standards have not been met, then one of the consequences is that the design team should strive to improve project performance in order to better meet the standards and meet the intent of the ROD. Now is the time in the project before the start of Phase 2 to take into account the lessons learned during Phase 1 and make appropriate changes to the project design to allow the project work to better achieve the standards and to maximize project quality. The state does not believe that the project should be modified between Phase 1 and Phase 2 solely through a change in the standards. The primary basis for having two phases as described in the ROD was a

recognition by EPA that the project design would need to be updated and adjusted as the project progressed. Experience in Phase 1, particularly related to oil/sheen release control and air emissions control showed that the existing design approach and the specified techniques used to implement the design during Phase 1 will need to be adjusted for Phase 2.

The state also believes that it is important for the peer review panel to understand that the techniques used to accomplish the work done during Phase 1 was not necessarily the best possible way to accomplish the project objectives. Rather, they were the approaches chosen by the design team taking into account not only the design team's understanding of site conditions at the time of design, but also the design team's view on what they believed were the appropriate choices given the range of design choices available. EPA anticipated

this when the remedy was selected by including the two-phase approach to project implementation to allow for lessons learned during Phase 1 to guide improvements to project design.

This is best described in the ROD. If you read the summary of the ROD it says this:

"Performance of the dredging in two phases whereby remedial dredging will occur at a reduced rate during the first year of dredging, this will allow comparison of operations with pre-established performance standards and evaluation of necessary adjustments to dredging operations in the succeeding phase or to the standards."

It's right in the ROD. It's not just a change of standards, it's detailed in the project operations.

The state also recommends that the panel consider that compliance with the elements of the other engineering and quality of life

performance standards intended to protect human health and the environment should be given priority over compliance with the Productivity Standard. The basis for the Productivity Standard is removal of the sediment over a six-year time frame (one year for a Phase 1, and five years for Phase 2) as described in the ROD. The six year time frame, as the state understands, is based primarily upon the differences in predicted recovery time frames generated during the FS process. These predicted recovery time frames were generated using a set of assumptions which included what we believe is an overly optimistic recovery rate under the scenario where no dredging would be done, particularly with respect to the annual PCB mass load transported by the river system. The evaluation of the data generated during the baseline monitoring program leads the state to

the conclusion that an extension of the project duration would be appropriate if this would result in better compliance with the standards established to protect human health and the environment, the resuspension, residuals and air standards, as well.

Thank you for paying attention. I look forward to hearing what you will say.

MS. HOLLAND: Right on that little pile there. Thank you so much.

MR. RIVERS: Good afternoon, everyone. I think the good news is I'm last your speaker. My name is Richard Rivers and I am the Vice Chair of Canal-New York Marketing and Business Alliance, a private sector, not-for-profit organization, which was created to represent the interests of businesses throughout the canal corridor in New York State.

Our mission is to serve as the one organization dedicated to tourism, marketing, legislative advocacy, and

business collaboration to support the existing and business opportunities within the entire canal system. Those businesses range from major corporations to family-owned retail stops, from hotels to bed and breakfast inns, canal-related companies to Main Street grocery stores and local museums. What is good for one part of the canal is good for all of the canal and when it's bad for one part, it's bad for all the others.

The New York State Canal System as you know is 500 miles of historic waterway comprised of the Erie Canal, the Seneca-Cayuga, the Oswego and the Champlain canals, and the canalized portion of the Genesee River.

An unprecedented marvel in the 19th Century, the Erie Canal opened the nation's heartland to the world and was, more than any other factor, instrumental in making New York City the premiere port on our eastern

seaport. It brought great wealth to the communities along the banks through the commercial shipping. Commercial shipping, unfortunately, shifted to the railroads and later to trucks, but the canal and the history it created and preserved is still an economic engine for the state and crucial to all the upstate communities in New York State.

Canal-New York believes to realize the full potential of the entire canal system for the state's economic revitalization, there must be positive, productive activity at every level and every sector; private, not-for-profit and government support, and action at all levels is important. Canal-New York believes the dredging must continue to maintain the specified depth of the Champlain Canal. Since the Champlain Canal has numerous areas with restricted navigational depth as a result of PCB contamination, we also recommend that

this navigational channel be dredged by GE currently in the next phase of the environmental dredging.

Thank you very much.

MS. HOLLAND: Thank you very much.

Okay, so we are -- Paul, we have about 15 more minutes until Steve was going to do his wrap-up. Did you want to say anything else before we do that?

MR. FUGLEVAND: One of the things we talked about is maybe seeing GE's presentation they had on the dredging plan we talked about this morning; is that possible?

MS. HOLLAND: Yes, as soon as we -- can we get this back up on the screen? Yes?

You have 10 or 15 minutes, max. You should be able to load that right up.

MR. HAGGARD: We will see if this is close to what you were looking for. Certainly, if it's not, let us

know and we can work with EPA to get you additional sets of maps.

MR. KRUPPENBACHER: My name is Tim Kruppenbacher.

What we have done from comments made yesterday, we took a look at some of the information from CU-2 and put sort of the base mapping together as well as the steps in the process. This does not include all steps of the process. It's just on what we put together overnight.

I will ask Andrew to kind of walk through and talk to what is on each one of the documents you put into the single Power Point presentation here.

MS. HOLLAND: Panel members, if this is not focusing on what you particularly need, let him know to move into what you do need.

MR. INGLIS: Basically, this is going to walk us through quickly the steps in the process. This is an abbreviated version, right, so this

contains the high points.

The first part I'm reading off, this is the design prism set based on interpolation of total PCB depth based on the SSAP cores we discussed in the last two days. So that is the design prism. The first dredge pass was dredging to the design prism. We went out and did residual samples. One of the critical points to remember is the sample locations were not the same as the SSAP program. They were offset by 40 feet. So the residual samples were taken at different locations and the first design samples.

And we based on that residual samples. We took a look at the surface concentrations. The way it was laid out if the surface concentrations were less, I think 6 tri plus, that, in theory, we were in residual mode and we only had to go down six inches. We only did that once that was in CU-1. That was the first one where we encountered the

situation. We realized that going forward from that, these were not necessarily the residual sediment, it just meant that we were less than 6. From that point forward, instead of looking at the surface concentrations, we looked at the concentrations of depth.

Regardless, the way we set the future dredge prisms, in theory, if it was residual, we would do 6 inches. But actually we would look at the total PCBs and set the prism to be at the 1 ppm level, or if we didn't have that information, we tried to uses the weight of evidence based on bathymetry cores that were nearby and also in consultation with EPA who set a redredge prism. We'd give that redredge prism to the contractor and he would go back out and redredge to that.

And this is actually showing a picture of CU-2, what the design cut actually looked like in terms of

dredge depth. You can see down here we had deeper cuts, in this area, shallower cuts. The deeper cuts here were up to 5 and up in here, we had removal between 7 and 12 inches. Here it was 6.

This area basically, this finger extending down here turned out to be bedrock. When you look at the design cut, it was a shallow cut of 10, what we found off the SSAP program. If a core was not taken, a graph sample was taken. So in bedrock areas, we have a dredge prism design based on a draft sample. So it was a thin cut, and we'd have to go back cover all the rock. So we dredged to that.

MR. FUGLEVAND: Question? So the original SSAP cores, was the mud line an elevation? Did you have an elevation as well as depth, and you have to come back and go down and try to do a to pre-dredge, you'd do a pre-dredge survey and did you dredge to a depth?

MR. INGLIS: Everything was set off elevations. So the DOC was based off the core that was created. And that created a depth contamination that was draped over a 2005 bathymetry and that turned into a basin. So at no point did we have a classic flat surface. This is a continuously changing, 3-dimensional surface. Everything was draped over an actual bathymetry. And the prism that was given to the dredge contractor was a one foot by one foot prism.

MS. HOLLAND: I just want to check, your card's up. Is that because you want to ask clarifying questions?

Also I just want to mention we need to give EPA an opportunity for feedback after whatever you guys are going to share.

Or if the panel wants, you know, you can have EPA come on up and address the input. But we have about what, 20 minutes, 15-20 minutes.

MR. THOMPSON: I just want to ask you a clarifying question.

MS. HOLLAND: All right, I just want to make sure you give balance and let EPA respond to anything GE says.

MR. THOMPSON: Just for clarification, what is the actual design like? Presumably, design would look something like this, you did this by inverse distance weighting interpolation of the depth cut; but that wasn't my deep question. Actually, I have another one.

MS. BENAMAN: This is the actual design cut. So the prism was set for the most part, except in areas of clay. The prism was set by taking the SSAP cores and we had a measurement of PCBs, a profile for each core. We set layers 0 to 2 inches, 2 to 6, 6 to 12, so on, all the way down and we interpolated total PCBs at each one of those layers. So we'd get a one by one set grid at total PCBs at depth.

We'd select the depth below the

peak and that became the DOC for that grid cell. That was done across the entire CU.

MR. THOMPSON: That clarifies that question then. Thank you.

What did you do for those areas where you had incomplete cores, how did you interpolate those?

MS. BENAMAN: The incomplete cores were treated in different ways depending on the structure of the profiles. Sometimes they were extrapolated using an equation for a concentration. Sometimes we had to make some assumptions about what the concentrations might be. If the profiles didn't look like a classic profile, we didn't feel it was appropriate to extrapolate it. It's probably best for us to provide to you all of the details from the data report and the design report to properly address your questions.

MR. THOMPSON: Last question, all seven core samples, were the

elevations the same or were they from the depth below?

MS. BENAMAN: The interpolations were done by --

MR. THOMPSON: No, no, collected sediment cores, were they collected for elevation bathymetry, or were they just actually reported by the depth below.

MS. BENAMAN: When they were gathered, there would be established to zero point by draining off the water, and that was set at zero inches. Am I not answering your question? I don't understand.

MR. THOMPSON: Let's move on, because of timing constraints.

MS. BENAMAN: Okay.

MS. HOLLAND: Do you want to proceed then?

MS. BENAMAN: Okay. The elevation of SSAP cores was established by matching the cores to the 2005 bathymetry -- does that clarify it?

MR. SCHROEDER: One part of my question is you established a mud line. When the sampling was done and the coring was taken, was the mud line established during elevation at the time of the core?

MS. BENAMAN: No, it was established at depth, and then once the interpolation was done at depth. So how there could be an interpolation is that we had a one by one grid, here is the depth of contamination, whatever that CU, and that depth would have been subtracted from the 2005 telemetry to tell us here is the elevation to which you need to dredge to get that cut.

MR. INGLIS: The SSAP program was 2005, so the multi-elevations were the same year that the cores were taken.

This is just an example of the residual core locations. This is CU-2. We came in, this is the offset location -- we enlarged it a little

bit so you can see it better -- showing the surface concentrations. Essentially, what this indicated, was that the surface concentrations throughout the CU were high enough that we would have to look at the deeper course actions to reestablish a second dredge prism that would be deeper than six inches, essentially.

Any questions?

MS. HOLLAND: I just want to make sure you get through your slides. How many slides in total do you have?

MR. INGLIS: I have about four.

I have these polygons are TD polygons at this point.

MR. THOMPSON: Why the switch?

MR. INGLIS: Just the fact of the residual standards.

This end looks at the depth. This area here, this way, is bedrock. So we sort of had it in a different color so it's clear to everyone involved. You can make out that, say, for example, here you have the boxes

and each box represents a six inch portion of the core. As you go down, this represents a deeper segment. This is what we used in our meetings with EPA to review the data to make decisions and to apply a depth of contamination.

Then this formed the basis for the re-dredged prism. So the depth of contamination was based on the cores, would be then draped over the bathymetry to create a dredge prism that was then given to the contractor for dredging.

MR. FUGLEVAND: When you draped it over -- was there an intermediate step? How did you create areas of elevation? Did you do any kind of interpolation between the cores to give to the contractor?

MR. INGLIS: It was a two-step process. You have the, you create an X, Y, Z using these polygons. You see that the lights here, that would define the area of influence for this

core point.

MR. FUGLEVAND: What is the elevation for the entire polygon?

MR. INGLIS: We assign that depth of contamination to that entire polygon. That would then be subtracted from the bathymetry. There would be engineering considerations applied. For example, if you had a four foot cut adjacent to a two foot cut, we put a 10:1 slope between the two locations. That dredge prism, created in a 14 hour period, was given to the contractor, and they put it back into their systems and they would go back out and dredge it. So this in terms of actual elevation type bathymetry, this gives you a better view, a sort of subtle image of the standards, and you can see the colors here represent the depth, this section of the designed prism. I will walk you through this. This is after the first dredge pass, the survey showing the dark areas, the deeper

concentrations.

This is the second dredge prism. It shows the areas we went back to the dredge. Obviously, there's nothing here we had to re-dredge. Then there was the second dredge pass, a survey of the area, third dredge pass, and so on. That is pretty much it.

MR. FUGLEVAND: That was very helpful. Now we understand the process. It was much more complicated than your description. I understand how you did that, and we appreciate it.

MS. HOLLAND: Does EPA have clarification or feedback?

MR. GARVEY: Andrew, if you go back to the first slide, you have the area where you talk about the SSAP results. To put things in context, the area to the north where you ultimately stumbled on bedrock, the anticipated depth of cut was about -- even though it was grab samples for collection at the time, the SSAP

program was ongoing, it wasn't clear whether they came back with a grab in the core, and whether you would get a grab, because it was too thin or it was too coarse. When you didn't get a core, you were required to collect a grab. But in all cases, whatever was designed for dredging, whether it was grabbed or cored, it was confirmed by probing. Because as you probe before they would call you to get a grab sample, they have at least six inches of material. In areas less than six inches, those were identified basically as rock and taken out of the picture.

Another point about the bathymetry issue with the core tops, the cores were collected, I believe, in this area primarily in 2002 and 2004. There were some supplementary ones done in 2005 but, we didn't know how to draw the line here. There were another couple of cores here but most of -- the bulk of the sampling was the

year before the bathymetry was collected -- or more.

Now, go to the Tyson one. The main reason this was done with Tyson polygons is the speed. One of the anticipated things in the field is to, again, to minimize the turn-around time. We did this fancy interpolation model during the SSAP design program, but there is no time in the field running an interpolative model to connect the dots. This is the EPA interpretation, and the way it was written up -- sorry, I thought it was in the ram clock that we settled on this -- but in any case, I thought it was, but then GE and EPA agreed to do it this way during at the time, because this would allow for rapid assessment of the depth so we could all agree what it was and we could move forward, and it was relative and unambiguous, recognizing there were problems with, you know, joints, if you would, where you have one location

that's 2 feet and one location at 4 feet, but, nonetheless, trying to arrange for sloping, those kinds of calculations, would have added to the process. That is all I have.

MS. HOLLAND: Any other questions by the panel?

MR. FUGLEVAND: This is for Andrew. When they set up the dredge lanes, did the primarily go up and down the river and then as they moved from polygon to polygon, did they adjust for the depth on the computer screen.

MR. INGLIS: Correct. The lanes were typically parallel with the flow. They would go upstream and downstream, and we had discussion before and after each bucket was mapped out by the contractor. And it's about here on the screen, every single bucket and the depth they had to go for that bucket. When you are trying to dredge a three-dimensional surface, it's very hard. You have to know exactly the

location for each bucket. It's tough in a three-dimensional surface.

MR. BRIDGES: So you are saying the length was upstream, downstream, east to west?

MR. INGLIS: Right. It was following that parallel with flow. So the dredge lane would be going like this (indicating). The dredge would start here and move sequentially down, digging that lane, and come back and move sequentially to 2.

MR. BRIDGES: So the one question I have with respect to, with respect to generating residual and that follows into the wake of the previous lane.

MR. INGLIS: Yes, that was obviously a very large concern before we started this. What we saw actually in practice, there were a few cores that showed examples of disturbed residual layers. And an issue we really grappled with this summer was more this concept of deeper bathymetry

sediment. So the concerns of actual generated residuals, I think, became secondary to just getting down to the 1 ppm level in areas.

It's something we did consider a lot and spent time talking with the dredging contractor about how to avoid that, but it turned out not to be the driving force.

MS. HOLLAND: EPA, did you have anything you wanted to share on that?

MR. GARVEY: Just one point.

I guess we could say we agree with Andrew on that point. The majority of the time spent looking after the inventory, in fact, the observation that we rarely ever made two, true 6-inch residual passes over any limited area speaks to the fact that the redistribution of the material did not create enough "deposition" if you would to cause you to trip the standard and require you to go back for a residual a second time. Most of the time it was doing

to two inventory and a residual; that was enough.

MS. HOLLAND: Anything else from the panel?

MR. FUGLEVAND: One other question. What was the typical range of cut depths; was it 1 to 2 feet, was it 4 feet; what was the range?

MR. INGLIS: It depended greatly -- let me go back to the design cut as an example. I would say this was quite typical in a CU where you would have, some areas you would have 5 or 6 feet, other areas where you would have 6 to 10 inches. I mean, one thing that we all saw this summer was the PCBs really would not do what you'd like them to do, so the ranges varied.

MS. HOLLAND: Greg, you had a question?

MR. CONETTA: Let me respond. One of the reasons here, as well, the hatch lines in the middle is a navigation channel. There was a

minimum depth you had to meet.

MR. HARTMAN: Your typical cuts were 40 feet wide?

MR. INGLIS: Yeah, 320 dredger and a 385. The 320 was about 30 feet, and the 385 was 40 feet.

MR. HARTMAN: What's the width of the channel location?

MR. INGLIS: About 200 feet wide.

MS. HOLLAND: All right, anything else from the panel?

Okay, we will go into our concluding remarks then.

Thank you all very much for that impromptu surprise.

These are actually in our report.

MS. BENAMAN: These are actually in the appendix of our report. It's in the draft report. It's Appendix C.

MS. HOLLAND: Great, thank you all very much. Thanks are for your flexibility.

Okay, Steve.

MR. GARON: For those of you who weren't here yesterday, my name is Steve Garon. I'm here with the SRA. We are the Peer Review contractor.

I had the pleasure of opening these proceedings and also the pleasure of closing them. Before I do, I want to see if Paul has anything, the ultimate word, any final thoughts that you would like to share on behalf of the panel, or you can decline if you care to.

MR. FUGLEVAND: Only one of the remaining things, our process now is to take care of the schedule we talked about on day one. Our deliberations will begin in earnest. One of the things we are going to need is the final report. So I think right now we are anticipating the 26th of February is when we get the final reports. That's real important for us to meet the schedule of the Peer Review. So today if there is any chance that that schedule might slide and if we need to

reschedule, that will give us time. I think that is only the thing from my perspective.

We greatly appreciate the Herculean effort on both GE and EPA's part to put a lot of data together in a short period of time. We just came out of the field yesterday basically and the reports that were prepared and that kind of thing, we know you were probably really working hard and, again, it's been very helpful. We appreciate it. We appreciate the efforts to generate that data.

Then the presentations in the past two days have provided a lot of good insight for us and we also appreciate it. Thank you both.

MR. GARON: This is a perfect segue of the schedule. I want to make you aware of what is going to happen down the road. As Paul mentioned regarding the current schedule, it implies the final GE and Phase 1 Evaluation Reports are to be completed

by next Friday, the 26th. Thereafter, from February 27th through April 7th, there will be a public comment period.

EPA is going to manage that public comment period, because that information from the public are input into the decision process. So that will happen from February 27 through April 7th. There will be an announcement forthcoming from EPA about where the public comments are to be kept and you can look for that soon. Those comments will be made available to the panel for its consideration from approximately April 22nd through the 30th, and the Peer Review panel will have actual deliberative meetings that will take place from May 3rd through the 7th. Per our discussion today, we are targeting the dates of May 4, 5, and 6, in the middle off that week just so you know. And then from the end of that panel meeting through May 28th, there is going to be a lot of heavy

lifting on behalf of the panel and SRA to get the Draft Peer Review Report to EPA and GE.

And then June 25th is the date for the Final Peer Review Report to be distributed simultaneously to EPA, GE and to the public.

I just want to make you aware of some information. Do you have a question on the schedule?

AUDIENCE SPEAKER: On the period of the Peer Review panel meetings, would that also be a public meeting?

MR. GARON: It will be a public meeting, open to the public, okay. I'm sure we will make an announcement about that once the dates are set.

I want to make you aware of some of the information that is going to be available imminently. The EPA presentations that were shared yesterday and today will be available by tomorrow on the www.hudsondredgingdata.com website. The GE presentation over the last two

days will be available by late today on the www.hudsondredging.com website. They are very similar.

The last thing is that SRA will do is develop a summary of these proceedings. That will include a transcript prepared by our poor court reporter who suffered in the last two days trying to keep up with all of this, including all of the presentations, the summary, the sign-in sheets, whatnot, and those minutes will be available in probably about in two weeks.

And that's pretty much it. No, one last thing. I don't want to end on a downer, but I want to remind you all that one of the panel ground rules was that the panel may not discuss the Peer Review with the public, with EPA staff, or contract support members, or with GE staff or their contract support at any time outside of the public deliberations. This ground rule was intended for them and it

applies to you, as well. In other words, don't try to chat them up without the other side, okay?

Finally, I would like to thank all of the public observers and members of the public for their comments and attention and the presenters for all the work you clearly put into your presentations and, finally, the panel for the thoughtful and provocative questions, and Melinda for facilitating this meetings. That's it. Safe trails back home.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, JOAN A. DE CARO, Shorthand Reporter and Notary Public in and for the State of New York, do hereby CERTIFY that I recorded stenographically the foregoing testimony taken at the time and place herein stated and the preceding testimony is a true and accurate transcript hereof to the best of my knowledge and belief.

_____

JOAN A. DE CARO

Dated: _____

PLEASE NOTE: This transcript is not to be distributed to any third party. You may copy it or send it internally within your own offices and branches. Notify this office first if you need to distribute or copy any portion of it for any other purpose.

Martin Deposition Services, Inc.
Malta Commons Business Park
100 Saratoga Village Boulevard
Building 37, Suite 37C
Malta, New York 12020
Toll Free: (800) 587-6832
Fax: (518) 587-1539 Website:
www.martindepo.com

0

0 (3)
537:14,23;718:20

1

1 (124)
438:12,19;439:7,18;440:6,18;441:20;443:13,14,19;446:22;453:22;459:14;461:8;469:16;475:2;476:6;483:18;485:23;490:5;493:11;495:23;497:24;498:1,12;499:9;502:14;510:15;512:16;514:21;521:7;522:24;525:1;526:3;527:10;531:17;532:4;535:12;538:5,6,13;543:13,19,22;544:3,16;545:13;546:2;547:25;552:16;553:22;555:17;557:4;559:9;561:22;562:1;563:5;564:20;567:18,25;569:9;572:9;574:3,11;575:6,23;577:3;578:10;581:1;584:2,18;585:23;591:15;592:5;595:13;602:3,4,11,12;603:4;612:21;631:24;633:6,22;634:13;635:9;639:9;648:25;650:10;652:21;657:23;658:18;676:17;681:25;682:1,6;689:19,23;690:6,10,12;691:16,18;694:12;695:25;702:1,2,12,16;703:1,7,13,24;705:16,22;706:4,9,15;707:4;708:8;715:14;730:4;731:7;734:24
1,000 (1)
455:6
1,090 (1)
454:14
1,800 (1)
455:21
1.3 (1)
554:7
1.4 (2)
544:8;584:3
1.8 (2)
439:15;440:5
1/2 (1)
445:6
10 (36)
438:22;468:23,23;474:7,8,18;476:23;480:14;499:2,2;507:25,25;511:24;512:1,2;513:7;533:4;536:12;555:18;600:4,5;601:25,25;602:3,3;605:25;624:15;626:10;656:14,14,18,18;691:24;712:20;716:10;731:15
10,000 (1)
454:12
10,078 (1)
460:5
10,878 (1)
457:20
10.0 (1)
511:6
10.2 (1)
510:25
10.8 (1)
511:1
10:1 (1)
724:11
100 (5)
450:7;470:6;475:19;510:20;558:13
100- (1)
543:20
100% (1)
630:8
100,000 (2)
563:13;595:20
1000 (1)
624:14
100-year-old (1)
569:1
105 (1)
557:3
109,000 (1)
538:15
10-minute (1)
614:23
10th (1)
475:13
10-yard (1)
448:6
11 (6)
451:25;471:11;476:23;586:11;587:9;591:6
110,000 (1)
543:20
1100 (1)
523:5
111 (1)
470:7
112 (1)
470:7
114,000 (1)
464:17
12 (19)
445:2;451:24;452:1;470:8;527:2,6,7;533:18;593:23,24;645:2,9;653:18;654:14,16;679:12;680:11;716:5;718:20
120 (1)
539:7
123,000 (1)
552:5
1-27 (1)
691:3
12-inch (1)
645:11
13 (5)
445:22;536:7;586:13;587:9;594:6
13,000 (2)
469:8;470:24
134 (1)
545:14
13th (2)
470:23;475:13
14 (4)
450:4;469:13;537:24;724:13
140 (3)
452:6,14;539:7
140,000 (1)
537:14
1400 (4)
463:25;464:3,15;478:23
141 (1)
544:21
144 (1)
452:5
1440 (1)
650:20
15 (7)
450:4;498:2;530:18;544:16;632:8;712:8,20
15,000 (1)
662:11
15.6 (2)
460:15;461:4
150 (1)
476:12
1500 (1)
478:15
15-20 (1)
717:25
15-hour (1)
463:21
15-minute (1)
530:21
15th (2)
475:14;545:15
16 (1)
677:23
16-18 (1)
619:12
165 (3)
452:3;538:25;544:18
16th (1)
475:14
17-18,000 (1)
451:7
18 (3)
445:6;542:13;632:7
18,000 (6)
454:1,20;456:4,6,16;460:19
18,125 (2)
452:24;457:9
18.28 (1)
460:25
180 (1)
650:18
1825 (1)
678:8
195 (1)
445:1
1974 (2)
437:6;469:12
1980 (1)
679:18
1990's (3)
565:20,21;703:10
19th (1)
710:21
1-A (1)
654:11
1st (3)
470:21;620:13,21

2

2 (92)
438:19;439:7,8;440:9;441:11,16;442:13;445:6;451:9,16;459:12;464:20;479:19;482:2;483:6,16,20;486:5,8;488:10;490:13;491:5;492:17;510:13;515:7,14;521:6;527:21;528:12;531:22;532:9;535:9;538:21;539:3;542:12;543:13,14,25;544:8,11,14;545:3;546:5;560:2;561:25;563:5;566:18;568:4;569:24;570:19,21;572:3,10,14;573:22,22,24;574:12;575:11;577:4;584:17;594:11;608:4,4;637:12,18;639:13;649:1;651:4;661:5,12;662:22;664:13;666:21;671:14;672:4;673:12,14;682:14;692:7;693:25;694:15;703:4;705:14,22;706:10;708:9;718:20,20;728:1;729:12;731:7
2.3 (1)
441:21
2.65 (7)
438:17;439:16,24;440:6,16;441:12,18
2:30 (1)
675:5
20 (10)
433:14;444:25;498:2;501:3;528:22;642:4;655:7;690:12;702:9;717:25
20,000 (1)
690:14
200 (3)
527:5;666:14;732:9
200,000 (1)
439:1
2000 (4)
519:14;622:20;626:9;628:24
2002 (6)
438:16;444:5;531:8;688:22;695:12;726:20
2003 (1)
533:2
2004 (6)
438:16;625:8;697:24;699:20;700:11;726:21
2004-2008 (1)
701:5
2005 (7)
509:24;617:14;717:5;720:24;721:14,19;726:22
2006 (1)
636:9
2007 (2)
567:3;697:16
2008 (2)
697:16;700:11
2009 (7)
697:18,25;699:18,21,24;700:10;701:3
2010 (1)

677:23
2011 (2)
490:18;651:7
20-hour (1)
449:17
20-inch (1)
448:20
20th (1)
679:6
21 (2)
448:22;519:21
22,000 (1)
451:9
2250 (1)
450:12
22nd (1)
735:16
24 (6)
452:10,14;533:23;
544:17;558:2;593:24
24.7 (2)
460:13;461:4
24/7 (1)
651:5
2400 (1)
663:17
244 (1)
476:17
24-inch (2)
476:25;477:3
25 (2)
466:25;635:12
25,000 (1)
451:17
250 (2)
449:13,16
25th (1)
736:4
26 (5)
445:5;461:9;
464:8,12;550:1
260 (1)
636:12
2600 (1)
549:25
264,000 (1)
442:10
265,000 (2)
438:21;525:5
26th (2)
733:20;735:1
27 (2)
545:16;735:8
273,600 (1)
440:24
27th (1)
735:2
280- (1)
441:19
282,000 (1)
525:6
282,900 (1)
440:20
286 (1)
543:19
28th (1)
735:24
29 (1)
586:13
2-yard (2)
444:11;513:9

3

3 (12)
462:4;526:4;
542:13;547:16;
611:9;632:8,12,14;
637:12,18;668:24;
694:7
3,378 (1)
443:6
3,700 (1)
443:8
30 (12)
438:2;486:3;
488:11;525:8;538:7,
11;544:4;545:18;
595:24;646:5;
654:16;732:5
30,000 (1)
452:11
300 (4)
449:10,11;648:11,
12
30-consecutive-day (1)
486:3
30-day (2)
463:21;603:19
30th (1)
735:16
32 (1)
687:15
320 (3)
446:6;732:4,5
320's (3)
462:8;587:16,20
35 (2)
445:1;466:13
35,000 (2)
452:12;635:22
36 (3)
676:17;687:9,16
36,000 (1)
464:14
37 (1)
691:13
37,000 (1)
538:5
375,000 (1)
443:3
382 (1)
453:3
385 (4)
462:5;645:15;
732:5,6
3'9 (1)
445:19
3-dimensional (1)
717:9
3rd (1)
735:19

4

4 (10)
517:17;542:13;
547:19;625:11;
632:7;668:24;
694:19;728:1;731:8;
735:21
4,000 (1)
568:25
4,700 (1)
549:23
4,800 (1)
549:23
4:00 (1)
505:7
40 (22)
596:2;609:7;
626:24;627:13,17,
19;632:11,16;633:3,
7,12,17;634:17;
637:10,22;638:2;
650:17;654:15;
697:14;714:13;
732:3,6
40,000 (3)
452:15;454:25;
602:6
400 (1)
602:5
4400 (1)
445:23
45 (2)
449:5;517:13
45-minute (1)
471:15
46.7 (2)
460:11;461:4
47,000 (1)
486:6
475,000 (1)
442:16
475,300 (1)
441:24
49,000 (1)
469:9
4th (1)
453:21

5

5 (10)
449:10;450:2;
475:20;542:13;
587:22;608:4;
676:18;716:4;
731:14;735:21
50 (11)
449:4,12;467:11;
476:11;513:7;
558:13;632:18;
637:10,23;652:15;
654:14
50,000 (1)
648:3
500 (10)
454:4;513:18;
540:13;562:4,7;
573:5;579:19;
615:20;616:9;710:15
5000 (1)
449:20
52 (1)
467:11
52,000 (1)
543:21
528,000 (1)
443:6
528,100 (1)
442:9
52-foot (1)
467:18
53 (1)
589:20
540- (1)
543:18
55 (1)
588:20
550 (1)
604:6
5'7 (1)
449:25
58,000 (1)
441:14
5th (1)
463:20
5-yard (2)
444:9;460:18

6

6 (15)
453:25;467:1;
542:13;587:22;
608:5;654:13;
714:20;715:4,11;
716:6;718:20,20;
731:14,15;735:22
60 (9)
449:10;467:12;
547:7;626:24;652:5;
682:24;683:2;
697:14;698:2
60,000 (1)
688:11
600 (3)
472:2;527:5;
666:14
600,000 (1)
543:18
600-horsepower (1)
445:23
65,000 (1)
603:14
650 (3)
624:11;626:6;
691:15
6500 (1)
692:1
6-inch (1)
730:18

7

7 (12)
440:22;445:3,4;
471:16;518:25;
520:8;542:13;
585:25;586:10;
587:22;631:23;716:5
7,000 (1)
454:11
70,000 (2)
691:17,25
700 (1)
472:2
75 (1)
654:13
75,000 (3)
563:12;595:18,19
76 (2)
469:12;470:11
77- (1)
486:14
77,300 (3)
536:7;539:8;544:6
78,000 (5)
443:14;463:17;
486:14;491:11;
528:17
78,300 (1)
463:16
78,600 (1)
463:16
79 (1)
603:10
7th (4)
463:20;735:2,9,19

8

8 (2)
536:12;587:22
80 (2)
458:14;649:10
8-1 (1)
603:13
86,000 (1)
536:16
86,500 (1)
443:10
89,000 (13)

441:9,15;443:12;
463:14;464:18;
485:15;486:19;
490:3;491:10;532:1;
535:6;536:8;538:12
8-inch (1)
619:11

9

9:45 (1)
485:5
90 (6)
530:13;554:25;
580:20;581:6;
659:22,23
90,000 (1)
538:15
95,000 (1)
528:15
96,000 (1)
443:16
98 (1)
635:10

A

abated (1)
703:20
abbreviated (1)
713:25
ability (14)
531:23;532:7;
542:1;546:10,14;
566:5;598:17;
605:14;623:2,6;
650:21;651:2;704:6,
24
able (31)
449:20;451:13;
472:6;473:1;504:11;
505:8;528:14,16,21;
529:4;532:2;533:8;
534:6;537:3;546:5;
553:16,17;563:11;
568:3;572:9;581:6,
17;591:24;596:7;
604:17;609:13,15;
637:23;644:16,16;
712:21
above (12)
440:21;464:17,18;
477:4;499:7;507:19;
538:14;600:7;
637:14,15;672:19;
699:24
absence (1)
563:10
absolute (3)
485:17;486:22;
487:10
absolutely (2)
662:4;670:1
absorbent (1)
557:19
absurd (1)
691:22
accept (2)
441:4;507:18
acceptable (6)
507:17;575:9;
580:6;632:25;691:5,
6
acceptance (3)
474:16;478:2;
555:2
accepted (1)
565:14
access (9)
480:22;523:15;
660:16;661:1,9,21;
662:6,20,22
accessed (1)
478:13
accident (1)
530:12
accommodate (1)
546:2
accomplish (4)
493:23;702:24;
706:14,16
accomplished (4)
460:25;480:17;
619:1;695:14
according (2)
463:24;591:18
account (4)
612:5;697:7;
705:15;706:19
accounted (2)
539:20;555:18
accrued (1)
584:12
accumulation (1)
645:19
accuracy (2)
510:2;599:18
accurate (1)
463:15
accurately (1)
644:18
achieve (11)
441:10;449:22;
488:15;510:11,12,
13;532:2;544:6;
546:7;685:20;705:18
achieved (6)
438:13;441:13;
473:22;544:3,5;
545:13
achievements (1)
678:16
achieving (2)
692:21;694:16
Achilles (1)
584:11
acknowledge (2)
499:21;555:12
acre (8)
473:6;480:14;
507:20,22,24;602:5;
642:4;650:19
acreage (1)
555:20
acres (4)
476:17;480:1;
523:19;650:19
across (4)
437:9,11;519:1;
719:2
action (5)
445:13;660:21;
666:21;680:10;
711:18
actions (1)
722:7
active (5)
435:14;541:11;
542:11,14;611:13
activities (3)
548:25;657:11;
664:20
activity (6)
531:8;533:12,23;
584:21;617:18;
711:15
actual (22)
460:5;566:6;
569:12;580:11;
589:25;595:12;
607:13;610:16;
635:16;636:8,21;
639:5;654:19;667:9;
681:22;698:8;
717:10;718:7,14;
724:17;730:1;735:17
actually (46)
440:19;441:13;
444:14;445:9,17;
449:3;454:23;
457:21;464:16;
478:24;485:12;
503:16;504:3;
511:16;512:7;
541:16,23,24;
545:14;551:12;
559:3;564:6;595:11,
15;597:21;602:11;
610:9;621:14,17;
624:13;630:16;
631:7;667:7;675:22,
23;688:8;699:14;
700:23;715:12,23,
25;718:13;720:8;
729:20;732:17,19
Adams (1)
689:1
adaptation (1)
625:2
add (5)
451:20;527:23;
555:14;591:10;636:3
added (4)
540:25;589:24;
635:19;728:4
adding (2)
559:22;560:6
addition (2)
678:14;680:9
additional (22)
451:21;468:12;
509:9;528:22;
538:14;546:20;
548:11;550:2;555:3;
630:6;633:5,9;
634:13;638:7;
649:25;651:25;
655:8;661:9;681:17;
682:6;691:8;713:2
address (44)
436:11;479:22;
480:14;494:22;
498:14;499:23;
500:21;501:16;
502:20;503:20;
508:12;515:5;
549:18;551:8;552:6,
12;555:25;569:19;
582:10;583:11;
587:4;608:2;611:23;
618:24;634:10;
649:12;650:3;
665:10;670:3,10,22,
24,25;675:9,12;
683:17;684:4,4,5;
697:4,6;704:8;
717:24;719:23
addressed (9)
606:12;617:8;
629:15;652:20;
654:22;663:12;
684:16;692:19;696:8
addressing (2)
582:14;607:23
adds (1)
586:13
adequate (2)
464:24;525:24
adequately (1)
670:2
adjacent (1)
724:10
adjust (1)
728:13
adjusted (3)
690:9;706:3,10
adjusting (1)
483:14
adjustments (10)
534:25;541:2,13;
547:4,24;556:15;
589:22;677:3,6;
707:16
administer (1)
496:17
Administration (1)
675:21
administrative (1)
491:24
advance (1)
479:11
advanced (1)
439:4
advancing (1)
571:13
adversely (1)
700:19
advising (1)
687:7
advisory (1)
687:6
advocacy (1)
709:25
affect (4)
603:21;624:17;
630:16;673:17
affected (4)
446:21;590:23;
700:16,19
affects (1)
660:1
affirmed (1)
676:14
afternoon (5)
474:12;594:5;
674:11;687:1;709:13
afterwards (1)
530:19
again (58)
433:5;434:22;
435:9,10;443:13;
463:15;469:12;
470:1;473:10;
477:13,13;484:7,15,
25;489:8;493:6;
518:8;533:1;536:3,7;
538:10;549:13;
552:25;554:23;
560:20,24;561:18;
562:17,22;563:13;
567:18;568:4;
571:18;573:11;
574:8,21;576:18;
579:15,18,22;595:5;
600:9;615:7;620:9;
621:4;644:11;
645:14;657:1,3;
659:20;664:3;672:9;
680:23;683:8;693:8;
699:8;727:7;734:12
against (4)
517:23;567:23;
639:11;697:18
agency (6)
435:17;591:20;

648:18,19;649:3,4
agenda (4)
433:16;435:16,18;
674:9
aggressive (1)
557:16
ago (3)
485:22;565:15;
568:11
agree (14)
449:24;474:10;
480:24;509:5;
510:20;535:17;
551:19;607:18;
627:22;630:25;
658:24;670:1;
727:21;730:13
agreed (3)
506:5;552:13;
727:17
agreement (7)
474:20;557:6;
573:15,18;580:18;
608:12;623:18
agreements (2)
648:10,17
agrees (1)
474:13
ahead (6)
467:22;525:14;
530:15;593:1;
681:20,21
air (9)
534:22;556:22,25;
559:14;561:14;
590:5,10;706:6;
709:7
Albany (6)
458:6,7;631:13;
697:12;699:6;700:10
algebraic (1)
578:6
Alison (1)
435:23
all-American (1)
678:17
Alliance (1)
709:18
allocated (1)
461:15
allocating (1)
579:11
allow (20)
471:23;487:1;
514:22;519:18;
521:11,24;522:4;
581:12;607:25;
660:11;692:3;
695:18,20;702:15;
704:10,18;705:17;
707:3,13;727:19
allowable (1)
691:14
allowed (7)
434:24;436:13;
503:23;658:15;
661:22;692:1,15
allowing (1)
518:13
allows (2)
570:19;580:11
alluded (1)
536:24
almost (9)
445:16;488:2,2;
497:4;549:23;
595:24;596:2;607:9;
624:14
alone (1)
598:25
along (8)
446:6;468:7;
494:15;566:7;
610:19;695:10;
701:24;711:2
alternate (1)
651:1
alternating (1)
549:10
alternative (1)
563:2
although (5)
460:21;556:23;
674:16;687:10;
689:14
always (7)
450:16;452:17;
462:19;484:4;
493:17;506:21;
638:20
amazing (2)
577:12;660:5
among (3)
465:1;471:1;
572:21
amount (36)
441:16,24;451:5;
452:7;460:9;461:7;
464:19;493:10;
516:10;526:6;
533:11;543:8;554:7;
558:21;561:1;
562:11;567:17;
570:7;573:7,25;
577:11;579:25;
586:15;590:14;
628:20;631:10;
632:25;636:20;
647:3;652:1;655:12;
658:21;673:19;
681:6;682:10;694:21
amounts (4)
497:5;572:1;
581:14;695:18
Analysis (20)
439:11;453:22;
469:21;516:3,24;
522:2,3,4,9;524:7,
17;555:5;556:10;
587:23;590:15;
608:11;630:6;
668:25;695:1;700:15
analyze (4)
476:25;477:2;
517:25;612:10
analyzed (1)
532:14
ancestors (1)
678:7
and/or (2)
459:1;704:18
Andrew (4)
713:13;725:17;
728:9;730:14
anecdotally (1)
659:16
animal (1)
661:25
announcement (2)
735:10;736:16
annual (2)
543:16;708:22
anomaly (2)
469:7,10
answered (4)
529:10;551:25;
626:18;642:8
anticipate (3)
473:1;523:15;
561:24
anticipated (6)
470:10;589:18;
619:23;706:25;
725:23;727:6
anticipating (1)
733:20
anticipation (1)
641:20
anxiously (1)
550:8
AOC (1)
533:2
apart (2)
458:14;611:12
apiece (1)
675:8
apparent (1)
685:14
apparently (1)
613:8
appear (1)
596:1
appears (3)
587:25;607:9;
664:25
appendix (3)
585:19;732:20,21
applicable (1)
654:3
application (1)
671:8
applied (3)
615:21;671:13;
724:9
applies (2)
616:6;738:1
apply (4)
543:15;617:14;
671:23;723:6
appreciate (8)
565:11;582:9;
599:2;725:13;734:4,
13,13,18
appreciated (1)
613:13
approach (17)
483:11;521:2;
578:23,24,24;
580:10,19;601:8,12;
607:4;618:3;639:3;
649:14,23;650:1;
706:7;707:2
approached (1)
472:19
approaches (4)
578:22;617:11;
639:13;706:18
approaching (2)
509:15;647:6
appropriate (9)
489:10;601:17;
649:22;683:19;
704:18;705:16;
706:23;709:3;719:19
approval (4)
474:15;482:21;
494:13;589:23
approvals (3)
505:24;506:3;
555:6
approved (5)
531:14,19;540:18;
591:19;649:4
approving (1)
542:25
approximately (1)
735:15
April (3)
735:2,9,15
arbitrarily (2)
493:18;695:24
archeological (1)
530:10
area (53)
437:9;450:21;
458:4;496:21,25;
504:8,19;506:11;
513:13;518:22,22;
519:1;520:2;522:24;
540:23;541:10;
553:5,6;557:14;
558:15;589:13;
593:20,23;600:15;
605:18;621:21;
624:4;638:5;645:17,
18,25;646:3;649:9;
650:24;651:3;662:3;
666:5;667:10;672:4;
683:12;684:2,6;
699:3;700:24;716:2,
7;722:21;723:25;
725:7,19,21;726:20;
730:19
areas (105)
441:2;458:3;
462:1;500:1,16;
501:9,22;503:7,23;
504:2,13;506:10,16;
512:13;533:13,15;
540:20;541:8,9;
549:10;552:18;
553:2;555:12,17;
556:13;557:17;
564:22;572:8,10;
573:14;580:15;
581:2,6,9;587:21;
589:8,9;591:3;
592:21;593:5,7;
595:3;604:12,13;
605:15;612:25;
621:13;622:14;
631:25;637:7,11,13,
16,17,22;638:6;
642:5,25;643:5,8,9,
11,23;649:11,15;
650:21;654:2;655:5;
656:12;658:25;
659:10;660:10;
661:5,8,17;666:1,2,
25;667:1,2;672:5,7;
673:10,20;676:18;
680:3;689:16;692:8,
9,12,16;693:18;
697:13,14;711:23;
716:13;718:16;
719:6;723:17;
724:25;725:3;
726:13;730:4;
731:13,14
argument (1)
604:2
arguments (2)
652:14;693:1
arises (1)
539:6
arm (2)
467:19,19
armoring (1)
640:15
arms (1)
688:19
around (31)
446:3,11;450:15;
451:17;452:18;
455:8;464:6;466:17;

470:6,21;472:8;
475:19,22;476:22;
486:13;500:9;
513:16;528:6;
541:11;557:16,19;
603:10,13,14,16;
635:12;641:16;
668:21;681:9;
685:15;688:20
arrange (1)
728:3
arrangements (1)
524:15
arrive (1)
586:7
artery (1)
660:16
artifact (1)
691:20
artificial (1)
678:12
aside (4)
553:24;595:21;
598:1,18
aspects (1)
532:11
assess (1)
560:16
assessing (1)
518:5
assessment (2)
687:14;727:20
assign (1)
724:4
assigned (1)
695:24
assist (2)
661:3;702:17
associated (13)
492:12;545:6;
546:24;547:13;
550:17;559:6;
587:16;600:14;
629:9;658:4;691:11;
702:8,11
assume (3)
516:6;640:1;
694:24
assumed (2)
438:17;538:22
assumes (1)
545:4
assuming (1)
664:11
assumption (3)
585:4;644:6,12
assumptions (12)
539:2;544:14;
545:3;563:6;566:13;
567:20;639:19,21;
642:13,15;708:17;
719:15
assured (1)
545:22
Atlantic (1)
678:19
Atmospheric (1)
675:21
attached (1)
445:9
attainable (1)
595:22
attempt (2)
473:18;534:24
attempted (1)
547:1
attempts (2)
465:20;607:24
attendance (1)
689:8
attention (3)
585:13;709:8;
738:7
attenuation (1)
580:2
attitude (1)
514:9
attributed (1)
596:9
audience (4)
435:11,13,14;
736:11
August (4)
463:20;475:13,14;
540:11
availability (3)
549:19;550:16;
552:13
available (29)
436:5;452:1;
453:1,11;454:19;
456:5,7;459:20;
461:2;462:3,18,20;
464:3;472:14;
475:24;509:10;
527:25;565:21;
577:3;630:7;674:19;
693:9;704:4;706:25;
735:14;736:20,22;
737:1,13
average (22)
450:6;451:8,14;
460:1,12,14,16;
464:13;475:18;
537:19;543:20,21;
544:1;578:11;
590:17;594:7;
601:25;602:3,4;
603:19;642:4;653:13
averaged (2)
461:10;475:2
averages (1)
641:25
avoid (2)
608:15;730:7
avoided (1)
509:23
await (1)
550:9
awaiting (1)
463:18
aware (5)
617:25;671:8;
734:21;736:8,18
away (17)
455:9;467:4;
488:3;495:6;564:19;
576:14;600:17;
635:24;641:19;
655:19,20,21,21,21,
22,22;656:18
awful (1)
586:23
awhile (3)
454:12;504:10,24
axe (1)
509:3
axis (1)
537:12

B

babies (1)
462:25
back (116)
438:15;439:23;
444:5;447:21;451:3;
453:15;455:11;
460:17;463:7,12;
467:5,8,13,17;
468:17;471:17,20;
474:23;475:1,5;
476:8;477:1,2;
478:21;479:25;
484:22;489:16;
492:7;496:7;497:25;
498:17;505:23;
508:9,10;519:15,19;
520:10;531:8;533:1;
540:17,25;542:19;
543:7;550:18;
554:14,23;555:4,4;
556:21;561:18;
564:6;565:11,12,16,
19;567:22;569:7;
574:8,21,23;575:6;
576:10;580:22;
586:24;587:20;
588:6;592:18;
599:16;601:1;602:7;
603:5,25;604:17,23;
613:3;614:16;
615:25;621:3;624:6;
626:4,7;631:6,7;
636:18;640:23;
642:24;646:4,10;
647:6;648:20,21;
649:18;650:21;
656:22;657:1;658:6;
664:15;665:18;
672:14;674:2;
677:12;679:5,8;
712:18;715:21;
716:16,22;724:15,
16;725:3,18;726:2;
729:11;730:24;
731:10;738:14
backdrop (2)
481:22;483:13
backed (1)
472:12
backfill (18)
497:15,17;537:1;
640:8,17;641:3,6,18;
642:5,24;644:2,14,
25;645:4,5,7,8;
649:22
backfilling (2)
611:16;653:12
background (3)
635:1,3,6
backing (2)
488:3;556:20
backup (1)
560:6
bad (4)
698:21,22;710:11,
12
balance (5)
563:20;576:22;
588:4;605:14;718:4
balancing (1)
593:17
balls (3)
458:25;526:15;
615:11
band (1)
539:6
banging (2)
513:3;555:21
banks (1)
711:2
bare (1)
566:12
barge (19)
455:16,18,18;
456:23;457:13;
462:5;556:18;
557:12;561:10;
584:7;585:11;
586:10,12;588:18;
589:3;590:5;598:14;
619:16;620:16
barges (12)
533:20;556:16;
557:12;561:8;
587:12;588:19;
589:21;590:8;594:7,
12;595:4,6
bars (3)
537:24;539:13,16
base (3)
600:12;668:4;
713:8
based (37)
441:12;443:17;
461:1;524:18;
535:10,22;553:21;
566:5;574:5;577:2;
580:24;587:23;
592:3;611:1;612:5;
625:19;628:23;
636:17;649:20;
660:8;662:10,10;
663:1;680:25;689:8;
691:9;692:17;
693:11;695:7;
708:11;714:3,4,16;
715:16;716:14;
717:2;723:10
baseline (9)
631:4,5,15;634:25;
697:17,23;698:24;
699:15;708:24
bases (2)
446:12;516:23
basic (1)
641:1
basically (18)
446:12;510:6;
534:15;540:19;
543:11;548:20;
550:13;579:25;
588:16;610:1;
615:10;618:25;
619:11;686:14;
713:22;716:7;
726:15;734:8
Basin (4)
437:21;469:11;
518:25;717:6
basis (19)
484:10;491:25;
494:21;497:9;499:2;
502:21;527:21;
533:16;535:8,21;
538:2;544:1;563:1;
593:23;642:7;
651:12;705:24;
708:5;723:8
bathroom (1)
614:15
bathymetric (1)
635:20
bathymetry (12)
597:15;715:16;
717:5,11;720:7,24;
723:12;724:7,18;
726:18;727:1;729:25
beam (2)
446:11;527:17
beast (1)
506:2
became (5)
437:5;459:13;

679:19;719:1;730:2
become (5)
467:24;581:15;
591:25;592:15;
612:13
becomes (2)
597:12,13
bed (1)
710:6
bedrock (22)
483:20;503:22;
504:2;509:10;
512:13,24;548:23;
555:11,17,21;
597:23;598:1,18;
599:8;604:20;608:6;
655:1,3;716:9,13;
722:21;725:22
beehive (1)
533:22
beepers (1)
436:21
began (5)
470:21;540:1,20;
542:21;543:2
begin (4)
642:4;644:3,16;
733:17
beginning (7)
457:8;472:1,17;
477:14;540:9;
562:23;608:21
behalf (3)
484:25;733:11;
736:1
behaved (1)
610:12
behind (8)
437:13;523:10;
532:12;545:2;
614:19;638:25;
644:2;676:13
belief (1)
566:4
believes (8)
702:7;704:9,13,17;
705:7;706:11;
711:11,19
bell (1)
525:24
below (15)
447:24;497:24;
498:1;499:7;503:5;
507:20,23;511:7;
621:17,18;637:16;
689:11;718:25;
720:2,9
BENAMAN (8)
718:14;719:9;
720:3,10,18,21;
721:7;732:19
benefit (15)
522:2,4,8;524:6;
555:14;567:9;576:6;
579:6,13,14,15;
580:16;682:23;
683:8;702:7
benefits (3)
535:20;575:19;
576:18
best (25)
458:20;479:22;
490:9;505:12;
517:19;520:14;
531:23;544:4,4;
545:11;566:16;
567:16;602:16;
618:15;622:9;648:5;
665:19;680:15;
685:1,9,16,18;
706:15;707:6;719:20
better (30)
441:6;461:19;
476:24;480:24;
481:2;500:11;
501:14,23;505:11;
521:23,24;566:10;
578:15;601:11;
621:20;623:3;
633:16;647:14;
654:18;656:16;
666:7;673:14;
681:22;702:19;
704:10;705:11,18;
709:4;722:1;724:18
beyond (2)
603:13;624:15
bias (1)
623:9
big (16)
449:23;458:9;
459:13;461:20,25;
462:15,17;463:8;
517:10;526:15;
529:15;556:22;
567:5;577:16;587:7;
631:18
bigger (4)
467:9;518:17;
573:23;598:9
biggest (4)
455:7;575:4;
633:21;639:5
bill (1)
684:23
billion (1)
514:13
bioavailable (1)
580:1
biota (2)
703:15,17
bit (20)
454:19;474:5;
478:10;491:2;500:9;
517:7;539:10;
558:25;568:9;
575:24;587:6;
591:12;628:13,15;
654:6;666:7;682:15;
683:1;698:7;722:1
bite (5)
448:25;597:4,5;
619:13,13
bites (2)
597:3;599:24
bits (1)
609:9
black (1)
537:20
blame (1)
524:12
blameful (1)
684:14
blanket (2)
543:15;638:2
blind (2)
501:25;502:4
blizzarding (1)
432:7
block (1)
506:22
blocks (1)
480:15
blooms (1)
666:5
blue (2)
447:18;539:13
BMP (1)
672:21
board (3)
476:25;665:22;
687:7
boards (1)
481:15
boast (1)
678:11
boat (3)
659:14,18,19
boats (3)
446:2;659:22,23
Bob (15)
433:24;484:4;
514:4;530:23;
551:24;564:5,14;
571:1;573:23;
574:18;581:18;
595:14;657:17;
658:24;660:4
bobcat (1)
519:23
Bob's (1)
553:12
body (1)
567:7
boggles (1)
687:17
border (1)
688:14
borderline (1)
642:5
borings (1)
681:19
both (17)
434:2;438:19;
583:2;606:13;615:2,
17;626:15;640:11;
642:2;689:25;690:5;
694:5;695:8;704:5,
10;734:5,18
bottle (1)
492:8
bottom (17)
458:2;465:22;
470:5,9;477:3;478:6;
479:14;496:4;501:6;
577:16;632:21;
634:1;645:20;648:4;
654:25;668:20;691:3
bought (1)
487:25
boulder (3)
504:11,20;512:13
boulders (2)
458:9;509:11
box (7)
448:5,5,6,13,17;
566:19;723:1
boxes (2)
448:9;722:25
brainstorming (1)
685:15
brand (1)
477:8
break (11)
433:9;434:3,11;
449:13;456:10;
530:18;587:6;
611:18;614:23;
673:24;674:1
breakdown (1)
590:15
breakdowns (1)
452:19
break-even (2)
627:7,9
breakfast (1)
710:7
BRIDGES (20)
461:11,13;463:11;
508:19;509:6;
513:20;515:11,19;
529:15;583:9;606:4,
11;617:3;628:5,12;
664:1;665:5;669:16;
729:3,13
brief (6)
434:13;481:12;
617:5;657:19;
669:16;686:18
briefing (1)
530:5
briefly (2)
656:3;664:1
brilliance (1)
685:4
brim (1)
437:20
bring (6)
471:17;517:11;
520:11;566:11;
619:8;632:15
bringing (2)
620:15;679:5
broader (1)
521:21
broadly (1)
627:24
broken (2)
527:17;529:8
Bronson (5)
675:4,6,13,18,19
brought (10)
503:3;517:21;
518:17;568:12;
602:10;631:16;
634:22;679:8;
684:18;711:1
bucket (42)
444:11;446:6;
447:20;448:20,22,
24;449:3,6;450:1,5;
461:23,25;462:9,12,
13;465:8,11,13,21;
475:5;502:16;503:3;
513:2,9,10;519:21;
520:19,20;541:7;
549:9;561:15;597:3;
609:8,16;613:3;
619:15;645:10,16;
728:19,21,23;729:1
bucketful (1)
448:1
buckets (12)
444:10,13;458:9;
461:14,17,22;465:6;
466:7;598:10;
619:10;646:2;693:3
bucks (1)
647:16
build (1)
663:16
building (2)
437:25;528:6
bulk (1)
726:25
bullet (1)
500:8
bump (1)
486:17
bumps (1)
569:11
bunch (2)
437:24;472:7
business (4)
524:13;709:18;

710:1,2
businesses (2)
709:21;710:4

C

C-1 (1)
542:2
C-4 (2)
542:8,11
calculate (1)
690:5
calculation (1)
552:3
calculations (3)
624:2;693:6;728:4
call (10)
436:7;523:16;558:18;606:4;614:20;622:12;641:1,3;664:6;726:11
called (9)
438:13,20;439:6;444:10;445:14;446:1;536:10,19;585:24
calls (1)
484:4
came (19)
439:14;440:24;450:10;457:9;466:4;470:11;474:25;492:14;521:13;567:3;571:7;588:21;601:23;609:23;633:21;674:23;721:24;726:2;734:7
can (171)
432:15;435:21;436:23;450:1;451:14;459:6;461:13,19,20;466:14;476:11;480:21;481:23;483:2,14,16,23;485:16,17;486:2;487:25;488:9;490:10;491:2,3;492:22,24;493:22;494:15,16,19;498:16,20,24;501:2,2;503:20;505:5,11;506:21;508:12;510:5,11,18;511:12;512:8;516:24;517:20;518:8;520:2;524:17;529:18;530:7;536:23;539:7,20;541:9,17,21;542:20;545:1;551:19;553:8,9,13,14,24;554:6,7,9;560:1;561:9;562:2;563:25;567:13,21;569:18,20,21;570:6,20;572:10,11;574:19,21,25;575:3;576:4;579:12;580:6,8,14;581:1;582:25;583:1;591:10;592:17;596:24;598:8,23;599:2,10,12,15;601:11,21;602:21;603:5;610:21;612:5;613:19,21;614:4,20;615:6,7;629:1,12,21;630:4,6;635:16;636:11,17;639:16,25;640:6,17;646:15;648:5,23;649:7,10;650:16,23;651:11;654:5;655:25;656:23;657:19;658:5,22;659:3,16;662:2;663:21;664:4,12;665:14;666:22;667:2;669:2,7;672:8;678:11;683:14;684:3;692:24;693:3;698:8;699:13,16;712:18;713:1;716:1;717:23;722:1,24;724:20;733:11;735:12
Canal (47)
437:20;447:23;481:1;506:23;517:2;521:9,10,23,23;522:14,21,22,25;523:2,6,16;545:25;546:3;554:2;584:23;661:7;677:20,25;678:1,3,6,14,22;679:1,11,17,24;680:2,5,16;700:25;709:21;710:3,10,11,14,16,21;711:6,13,22,22
canalized (1)
710:18
Canal-New (3)
709:17;711:11,19
canal-related (1)
710:7
canals (2)
437:17;710:18
cap (13)
503:24;511:3;537:1;556:5;639:6,12;641:2,21;643:18,20,22;644:25;645:5
capability (1)
660:24
capacity (7)
447:11;449:2;451:19;466:11;559:25;561:5;687:9
capped (2)
642:6;676:18
capping (17)
611:16;638:24,25;639:10,14,23;640:2,9,20;643:25;644:8;649:22;653:12;676:13,15,19,23
caps (2)
640:18;642:24
car (1)
446:9
carbon (3)
670:23;671:8,19
carbons (1)
670:23
card (2)
620:8;656:24
cards (1)
656:22
card's (1)
717:15
care (5)
490:16,21;549:6;733:12,15
careful (2)
667:3;701:9
carefully (1)
511:22
Carmella (1)
554:1
carpenter (1)
445:25
carried (1)
466:24
carry (2)
467:11;691:22
cars (1)
529:4
carve (1)
615:15
cascaded (1)
556:21
case (11)
442:7;488:22;564:17;596:2;597:22;598:21;632:7,7;644:13;652:23;727:16
cases (3)
483:13;652:24;726:7
cast (4)
491:19;493:18,18;639:20
casual (2)
513:25;515:1
casually (1)
515:13
CAT (1)
446:6
CAT-320 (1)
444:13
CAT-345 (1)
444:12
CAT-385 (1)
444:10
catch-up (1)
624:6
causal (1)
699:13
cause (3)
609:2;668:7;730:22
caused (5)
546:17,18;547:4;626:22;668:18
causes (1)
659:23
causing (3)
454:7;465:23;694:22
caveat (1)
674:17
CD (3)
609:21,23,25
cell (2)
436:21;719:2
centimeters (1)
631:23
cents (1)
504:25
Century (2)
679:6;710:21
certain (17)
438:13;493:20;502:13;504:3,13;507:4;552:25;557:23;573:4,7;643:19;654:8;659:10;672:8;673:14,19;700:7
certainly (24)
459:11;504:1,1;513:15;524:17;528:12;529:3;543:9,25;567:10;582:9;592:14;610:24;630:4;633:23;637:4;647:2;649:8;652:20;659:12;662:22;672:14;700:15;712:25
certainty (1)
512:11
certification (2)
536:12;694:1
cetera (3)
482:15;623:16;686:12
chair (2)
614:13;709:16
chairs (2)
614:3,20
challenge (2)
663:20;685:23
challenged (2)
590:3;622:15
challenges (1)
604:4
challenging (4)
533:13;546:12;589:7;605:13
Champlain (9)
437:20;677:25;679:1,11,17;680:2;710:18;711:21,22
chance (9)
484:20;516:10;530:12;646:7,11;651:19;667:16,22;733:24
change (34)
441:22;443:8;451:21;490:11,11;491:17;496:11;505:3;508:3;520:20;527:16;542:21;576:2;579:1,19;586:3;590:11;598:7;601:8;602:2,11;611:20;625:18;653:25;663:19;676:6;677:4,8;691:8;699:8,14,25;705:23;707:20
changed (4)
519:17;564:23;625:19;653:21
changes (32)
449:18;452:20;457:7;482:4,4,5;491:7,16;563:15,25;564:11,24;565:2,4,6;568:1;575:1;594:15;622:12,24;623:22;625:19,22;644:21;659:8;676:2;677:7;702:17;704:16,22,23;705:17
changing (6)
533:16;565:4;568:6;576:4;654:6;717:9
channel (39)
437:11;454:6;462:2;467:2;471:8,23;478:12,16;517:9;523:16,22;540:22;542:10;548:7,10,12,23;549:3;552:19;553:3,3,4;555:22;572:11,12;587:18;588:22;589:11;591:9;661:7,14;679:10,25;680:7,11;

686:13;712:1;
731:25;732:8
channels (1)
630:7
chapter (2)
526:3,4
characteristic (1)
592:22
characterization (4)
600:18;647:1,4,15
characterize (1)
651:15
Charge (4)
434:20,25;615:10;
663:8
charges (1)
663:10
chart (5)
561:18,19;585:21,
22;586:9
charts (1)
539:12
chase (1)
558:22
chasing (3)
558:6;572:1;
600:16
chat (1)
738:2
check (2)
631:22;717:15
cheek (1)
508:24
chemistry (1)
622:13
Chief (1)
689:2
children (1)
608:5
choice (2)
509:2;585:15
choices (2)
706:24,25
choosing (1)
698:18
chosen (2)
565:13;706:18
chunks (1)
458:10
circle (1)
592:17
citizen (1)
687:6
City (2)
678:19;710:24
civil (1)
436:20
clarification (2)
718:7;725:16
clarifies (1)
719:4
clarify (3)
620:12;651:14;
720:25
clarifying (5)
554:10,11;562:16;
717:16;718:2
class (1)
583:25
classic (2)
717:7;719:17
clay (55)
451:1;458:1,4,7,8,
15,16,20,22,23;
459:4,10,14;483:21;
503:1,2,7,8,11,14,17,
18,23;504:2;526:12,
15,15;527:13;
555:11;556:8,13;
561:1;581:19;
587:22;599:10,11;
604:20;618:23,25;
619:2,5,13,21;
620:16,18,22,22;
621:10,14,16,19,21,
24;655:5;718:17
clays (2)
450:22;590:25
clean (19)
468:1,15;502:10;
503:4;524:1;529:17;
561:1,3;581:15;
619:2,4;639:8,15;
644:11;652:16,23;
653:5,14,18
cleaner (1)
641:15
cleanup (1)
681:10
clean-up (1)
591:1
clear (15)
440:15,25;454:19;
487:4;507:10;510:9;
572:20;589:12;
614:25;627:5;634:2;
670:5;692:23;
722:23;726:1
clearer (2)
512:17;654:9
Clearly (6)
451:18;603:9;
616:2;670:10;
699:24;738:9
clock (1)
727:15
clock-wise (1)
448:11
close (25)
441:5;442:5;
465:11,12,15,20,23;
474:8;475:2;496:14;
499:16;506:6;531:4;
536:4;539:9;571:25;
572:15;603:25;
607:16;608:13;
612:8;668:9;671:9;
699:9;712:24
closed (7)
465:9,13;545:20;
573:19;584:23;
606:22;607:21
closer (6)
455:4;456:2;
537:8;575:13;
578:17;653:15
closing (4)
466:6;481:5;
695:7;733:7
closure (2)
611:5,16
clothes (1)
437:11
clue (1)
568:21
clustering (1)
458:3
clusters (1)
502:15
coarse (1)
726:5
cobble (2)
555:17;587:21
cognitively (1)
701:8
cold (1)
585:8
collaboration (1)
710:1
colleague (1)
628:14
collect (2)
666:7;726:6
collected (11)
476:21;534:11;
621:1;626:24;
631:11;643:24;
658:20;720:5,6;
726:19;727:2
collecting (1)
535:22
collection (6)
593:15;657:7,10;
669:3,21;725:25
collectively (2)
494:16;495:2
co-located (4)
632:6;633:8;
635:14,18
color (1)
722:23
Colorado (1)
689:4
colored (1)
539:13
colors (1)
724:20
column (4)
691:6;703:9,15,16
combination (4)
570:13;618:4;
672:12;677:2
Combined (1)
676:21
comfortable (1)
432:5
coming (15)
451:6;462:24;
465:7;467:17;
490:17;517:14;
542:10;549:17;
574:21;608:7;
614:10;665:18;
668:19,22;674:2
comment (31)
434:5,10,12;435:2,
16,19,25;436:2,12;
508:23;510:5,6;
513:21;529:18;
597:9;601:19;606:8;
617:5;620:12,18;
638:18;663:7;
669:10;673:25;
674:4,10,25;693:11;
696:4;735:3,5
comments (13)
436:9;514:6;
582:15;606:6;
629:20;680:24;
688:25;689:11;
695:7;713:5;735:11,
13;738:7
commercial (3)
557:1;711:3,4
committed (2)
583:13,16
common (1)
482:10
communities (2)
711:2,9
community (1)
685:8
companies (2)
671:11;710:8
compare (2)
636:11,15
compared (2)
467:16;699:1
comparing (1)
508:25
comparison (2)
697:16;707:13
compilation (1)
609:24
compiled (1)
649:1
complete (8)
436:9;488:10;
501:1;530:16;
536:25;542:15;
569:5;660:24
completed (4)
588:14;678:8;
686:5;734:25
completely (2)
569:13,17
completion (2)
498:25;624:16
complex (3)
500:4;577:15;
613:12
compliance (10)
474:19;497:8;
560:5;600:4;602:12;
643:22;694:13;
707:23;708:4;709:4
complicated (2)
556:11;725:11
comply (1)
561:14
component (2)
544:25;562:25
components (1)
585:24
composter (1)
590:1
comprehensive (2)
514:23;515:6
comprised (1)
710:16
compromise (2)
567:9;625:7
compromised (1)
681:13
compromises (1)
579:5
computer (1)
728:13
conceived (1)
702:13
concentrated (1)
604:10
concentration (15)
454:3;479:15;
541:9,10;559:16;
561:20;604:13;
605:15;624:23;
627:10,11;669:13;
692:14,16;719:14
concentrations (25)
536:1;540:8;
546:17,23;561:23;
603:20;622:23,25;
624:25;633:12;
641:17,25;642:1;
644:3;691:7;692:13;
703:8;714:18,20;
715:6,7;719:16;
722:2,4;725:1
concept (3)
671:10,22;729:25
concern (12)
528:14;638:11;
664:5,16,22;676:1;
677:24;689:16;

690:20;692:10;
693:20;729:19
concerned (5)
446:25;530:2;
583:17;687:19;
693:12
concerns (6)
554:3;559:3;
633:21;637:15;
671:16;730:1
concise (1)
436:19
conclude (1)
567:7
concluded (3)
559:14;567:2;
592:9
concluding (1)
732:14
conclusion (8)
562:22;608:7;
677:1;698:25;700:2,
14,18;709:1
conclusions (4)
588:15;629:21;
698:22;701:9
concurrently (1)
680:8
conditions (8)
483:18;488:17;
491:16,22;548:14;
585:7,9;706:21
Conduct (1)
480:22
CONETTA (31)
498:7,17,22;499:1,
6,18;500:17;502:3;
503:6;505:19;
510:18;512:4;
616:21;618:17;
621:9;623:5;630:10;
634:20;636:5;643:2;
651:24;652:6;
655:25;656:6;
658:24;661:1,20;
665:12;667:11;
671:25;731:22
confidence (8)
500:16;501:22;
581:2,4,5,9;650:18;
669:18
confident (1)
654:10
confines (1)
678:20
confirm (1)
644:13
confirmation (2)
644:5;650:9
confirmed (1)
726:9
conflict (4)
560:22;573:3,9;
685:14
conflicts (5)
561:11;572:23,24;
576:21,22
confused (1)
487:8
confusion (1)
615:20
connect (1)
727:12
connection (1)
629:25
Connolly (17)
543:7;548:8;
550:23;575:7;
578:12;580:25;
605:5;611:23,24;
616:8;632:4;633:19;
650:13,16;652:5;
657:17;671:7
Connolly's (2)
541:5;561:19
conscious (3)
502:4;652:17,17
consequence (1)
487:7
consequences (2)
705:4,9
consequent (1)
629:10
Conservation (2)
697:3;701:16
conservative (1)
639:21
consider (11)
434:21,24;496:23;
560:2;577:23;
627:21;660:21;
702:5;703:21;
707:23;730:5
considerable (3)
615:19;628:19;
682:10
consideration (4)
497:20;671:1;
686:6;735:15
considerations (2)
673:3;724:8
considered (7)
456:24;489:15;
520:14;577:21;
619:2,3;647:23
considering (1)
493:16
considers (1)
524:11
consistent (3)
458:3;571:6;
618:14
consistently (1)
486:25
console (1)
465:12
constrained (1)
562:14
constraining (1)
560:4
constraints (3)
563:11,17;720:17
constructed (1)
664:24
constructing (1)
569:2
construction (6)
484:8,9;514:3;
520:25;584:1;619:6
consultant (1)
437:3
consultation (1)
715:18
consume (2)
514:18;517:3
consumed (1)
590:13
contained (3)
536:18;557:13;
684:7
containment (3)
549:11;557:19;
558:15
contains (1)
714:1
contaminate (1)
637:6
contaminated (18)
439:23;469:18;
470:12,13;507:3;
509:25;510:1;
522:23;561:5;
581:16;617:12;
637:19;653:1;
666:25;667:1;676:9,
10;679:21
contamination (19)
440:8;447:13;
479:23;503:25;
536:11;569:13;
636:21;638:2;662:3,
15;680:5;684:24;
685:10;711:25;
717:4;721:12;723:7,
10;724:5
contention (1)
690:21
context (7)
481:22;563:15;
568:13;622:19;
637:4;703:8;725:20
contexts (1)
625:23
contiguous (1)
588:25
continue (8)
471:21;484:11;
612:10;626:12;
634:15;702:23,25;
711:20
continued (1)
470:22
continues (2)
539:1;679:22
continuing (1)
545:20
continuous (1)
534:23
continuously (2)
678:10;717:8
contract (4)
435:17;489:19;
737:21,22
contracting (1)
496:16
contractor (25)
433:7,8;445:14;
473:21;505:16;
511:12;557:25;
558:2;584:16;
591:18;592:7;
596:22,23;599:23;
608:22;609:5;
660:17;715:20;
717:12;723:13,20;
724:14;728:20;
730:7;733:4
contractor-run (1)
433:2
contractors (4)
532:13;582:14;
600:25;665:21
contractor's (3)
519:12;524:9;
660:24
contracts (1)
592:6
contributing (1)
669:1
contribution (1)
693:7
contributor (1)
607:14
control (10)
505:14;516:12;
540:21;541:11;
566:16;573:19;
666:23;672:8;706:5,
6
controlling (1)
550:15
controls (7)
547:7;571:3,3;
578:14;626:1;
670:18;693:2
conventional (1)
446:9
conversations (1)
672:17
copy (4)
435:22;453:18;
674:13;680:19
core (25)
477:3;621:15,15;
642:1;647:20,24;
648:7;649:2,7,8,13;
650:8,9;655:2;
716:12;717:3;
718:19;719:25;
721:6,23;723:2;
724:1;726:3,6,18
cored (1)
726:9
cores (47)
458:13,15;490:24;
500:2;501:1,1,10;
502:16;613:14;
621:1;632:6;633:8;
635:14,18;647:7,7;
649:4,10;650:14,19,
20;651:17;652:1;
653:6,13;654:10,11,
14,15,19,20,21;
714:5;715:17;
716:19;718:18;
719:7,10;720:6,22,
23;721:20;723:10,
19;726:19,24;729:21
coring (7)
637:13;647:12;
648:13;649:25;
650:4;681:19;721:4
Corp (1)
567:11
Corporation (3)
545:25;554:2;
679:24
corporations (1)
710:5
correctable (1)
528:19
corrected (2)
528:12;623:13
correction (2)
549:24;656:8
correctly (3)
521:12;588:23;
596:20
corridor (1)
709:22
cosmetic (1)
570:24
cost (18)
454:13;455:6;
474:21;514:17;
522:2,4,8,16,18;
524:6,7;567:21;
660:19;679:18,25;
682:22;683:1,8
cost-effective (1)
685:21
costs (3)
524:15;652:17;
685:7
could'a (1)

489:3
Council (5)
566:24;687:4,5,12,19
County (6)
687:3,8;688:2,12,14;696:6
County's (1)
687:24
couple (21)
453:6;477:9;481:4;485:8;500:17;523:11;526:13;544:11;552:21;560:19,24;564:8,16;613:5;621:13;625:13;634:21;636:2;673:20;681:1;726:24
course (18)
434:20;439:18;450:13;460:2;469:3,24;472:19;511:21;547:25;557:3;558:7;583:25;584:4;613:6,23;667:12;702:2;722:7
court (1)
737:7
cover (3)
503:24;504:16;716:16
covered (2)
476:16;481:13
covers (1)
453:24
crannies (1)
509:14
crap (1)
497:6
crazy (2)
512:15;602:13
create (6)
574:3;638:1;723:12,17,22;730:21
created (10)
458:23;459:8;468:11;526:15;556:9;709:20;711:7;717:3,4;724:13
creates (1)
514:10
creating (1)
639:7
crew (2)
456:7,8
criteria (4)
454:10;535:17;616:13;691:9
critical (8)
544:25;562:25;571:8,17,20;628:16;630:11;714:10
cross (1)
523:20
crowd (1)
432:2
crucial (2)
677:25;711:9
crush (1)
465:18
CU (26)
468:19;469:5;473:6,12,18;476:10,13,17;477:5;479:8;480:14;482:21;496:14,20,25;497:9;499:2;518:23;555:2;608:22;611:14;613:10;719:3;721:13;722:5;731:12
CU-1 (15)
469:7,11;470:16,20;481:1;517:17;518:11,15;523:5;541:25;542:12;600:3;661:21;662:8;714:24
CU-14 (1)
604:11
CU-17 (2)
542:13,14
CU-18 (2)
557:23;604:11
CU-2 (6)
523:5;607:5;608:17;713:7;715:24;721:24
CU-3 (1)
517:17
CU-4 (1)
557:23
CU-5 (3)
467:1;504:5,7
CU-6 (3)
504:5,10,19
CU-8 (1)
542:12
cubic (45)
438:18,21;439:1,24;440:17;441:10,14,15,25;442:9,16;443:3,6,7,10,16;451:9,17;454:11;461:9;464:12,15;469:8;475:20;485:15;525:5;527:5;528:15;532:1;535:6;536:8,16;537:14,15,19;538:5,16;543:18;549:25;550:2;552:5;597:24;603:14;635:22;662:11
cull (1)
655:19
cultural (1)
678:22
Culture (1)
610:6
cumbersome (1)
659:9
curious (3)
494:4,8;647:17
current (2)
623:11;734:23
currently (2)
683:15;712:2
curtain (1)
671:21
curtains (2)
670:24;671:9
CUs (25)
476:19;506:13;512:23;541:23;542:6;545:19;554:22,23;557:23;571:25;572:15;587:22;588:25;606:21;607:16,20;608:10,13;611:6;612:21;613:21;621:12;635:23;673:20;682:7
CU's (1)
468:13
cushion (1)
442:7
cut (50)
437:12;447:15;448:21;458:12;468:5;469:2,20;472:20,22;473:1,2,19,22;474:21;475:17;476:5;477:7,11,24;478:3;480:1;498:17;499:21;507:5;539:16;556:5;581:5;597:19;599:8,18,19;600:8,13;610:14;619:12;621:5;649:16,20;715:24;716:10,10,15;718:11,15;721:17;724:10,11;725:23;731:7,11
cuts (25)
439:19;461:22;543:1;577:15,17;580:22;581:7;597:2,11;598:3,13;599:1,1,3,6,22;600:21;602:21,22;609:2;619:10;716:2,3,3;732:2
cycle (12)
448:15,16;449:5,8;450:2;459:5;527:5;588:18;591:1,22;593:11;622:21
cycles (1)
593:23
cycling (1)
588:1

D

daily (8)
443:5,8;472:3;484:10;494:21;533:16;534:10;593:23
Dam (9)
437:7,10,13;469:20;667:24;668:2,4;669:19;700:24
dancing (1)
500:9
dangerous (2)
584:25;694:24
dark (1)
724:25
dash (1)
561:21
data (75)
481:15;482:18;494:15;500:23;501:23;505:6,9;516:8,10,23;524:7;532:15;534:12,13;540:8;567:17;581:1;605:1,6;609:15,17,24;612:10;621:20;627:2;629:17;631:5,10,11;632:18;635:3;636:9;642:21;648:19,22;649:1,16;657:7,10,11;658:10,21,22;668:12,12;691:9;692:17;693:9,10;697:16,18,23;698:1,3,13,14,16,19,24;699:1,12,19,21;700:5,10,12,17;703:6,22,24;708:24;719:21;723:5;734:6,14
data-metric (1)
656:11
date (1)
736:4
dated (2)
453:20;677:23
dates (2)
735:21;736:17
Dave (6)
473:25;474:9;481:4;492:3;504:20;535:19
Dave's (2)
474:15;689:11
David (2)
689:1,4
day (40)
443:9,18;449:17,20;452:10,14;470:15,16;472:3;475:20;476:12,12;477:22;478:24;483:9;488:11;501:7;527:8;529:2,3;533:24;534:20;538:7,11;544:17,22,24;545:1;552:21;558:2;568:23;605:2;622:17;648:12,12;652:4;655:11;679:23;687:12;733:16
day-in (1)
544:7
day-out (1)
544:7
days (47)
449:16;451:15;452:2,3,6,6,13,14;453:6;468:25;472:21;473:6;475:21;478:14;480:9;481:11,14;484:23;486:3;496:2;527:8;533:24;534:1;538:25;540:14;544:4,17,18,21;545:14,18;546:20;549:6;560:22;563:20;564:8,16;608:15;628:18;629:24;660:7;688:17;689:10;714:6;734:16;737:1,9
day-to-day (3)
502:21;532:14;603:18
deal (16)
459:10;482:3;483:21;484:10;502:18;503:15;551:2;569:22;580:24;590:5,6;608:8;665:20,25;666:8,10
dealing (4)
533:13;590:10;604:19;662:16
dealt (2)
589:19;590:11
debate (1)
565:23
debris (11)
447:6;465:5;475:6;501:4,7;600:12;601:7,7;654:23;656:2;673:19

decade (1)
565:15
decant (1)
571:9
decanting (4)
541:7;549:9;
556:17;561:15
decide (2)
491:6;605:24
decided (2)
471:22;660:10
deciding (2)
468:17;643:22
decision (12)
502:4;505:2,10;
555:6;601:12;
607:11;617:24;
640:2;652:13;
701:23;702:21;735:7
decision-making (2)
581:23;638:25
decisions (6)
505:7;534:14;
640:7;657:12;
702:17;723:6
declination (1)
578:19
decline (3)
472:4;703:17;
733:12
declining (1)
698:8
decreasing (2)
543:5;599:3
dedicated (2)
688:16;709:24
deep (9)
439:19;445:2,7;
446:17;461:22;
501:4;513:8;577:17;
718:12
deepen (2)
471:22;521:10
deepening (1)
518:12
deepening-effect (1)
660:19
deeper (18)
471:23;512:2;
521:11;536:11;
554:13;597:2;598:8;
619:18;654:11;
655:4;662:15;716:2,
3;722:7,9;723:3;
724:25;729:25
deeply (1)
567:12
defensive (1)
698:17
defer (1)
598:19
deferential (1)
628:15
define (2)
480:1;723:25
defined (1)
637:13
definitely (2)
520:15;658:25
definition (6)
508:5;509:16,18;
606:20,24;607:15
degradation (1)
687:22
degree (1)
663:21
delay (1)
457:24
delayed (2)
465:4;681:23
delaying (1)
682:5
delays (1)
453:15
deliberations (3)
704:15;733:16;
737:24
deliberative (1)
735:18
delineated (3)
619:21;637:11;
661:8
delineation (1)
648:25
delivered (4)
624:3,5,13;626:9
delivers (1)
527:4
demonstrate (5)
485:24;486:4;
488:14;489:5;506:8
demonstrated (2)
488:7;489:19
Department (5)
675:23;679:15;
686:5;697:2;701:15
depended (1)
731:9
depending (4)
442:23;503:24;
653:11;719:11
depends (1)
560:10
depiction (1)
697:9
deposited (4)
627:25;633:25;
641:9;692:12
depositing (2)
636:22;670:6
deposition (6)
622:11;692:7,9,18,
20;730:22
depth (42)
440:8;447:12;
448:21;450:15;
469:13;479:23;
507:4;569:12;
596:18;613:1;
649:13;660:8;
679:13,25;680:4;
711:21,24;714:4;
715:8;716:1,21,25;
717:4;718:11,24,25;
720:2,8;721:8,9,12,
13;722:20;723:6,9;
724:5,21;725:23;
727:20;728:13,22;
732:1
depths (1)
731:7
describe (2)
461:13;570:7
described (4)
571:11;705:25;
707:6;708:9
description (1)
725:12
descriptive (1)
596:21
design (76)
437:14;442:13;
449:1;451:21;
453:21;468:5;
481:25;482:1;
483:15,17,22;
488:17;499:19;
505:22;520:22;
525:1;531:20;533:3,
6;536:10,14,19;
539:3,14,15;545:10,
11;553:1,11;560:3;
565:2,3;568:5;
580:14;581:9;
584:17,19;586:19;
594:17;610:3,6;
619:20,23;652:8;
660:3;662:10,14;
679:6;701:25;
702:18;703:3;
704:22;705:9,17;
706:2,7,9,18,20,21,
22,24;707:5;714:3,6,
8,15;715:24;716:9,
14;718:8,8,15;
719:22;727:9;731:11
designated (1)
435:15
designed (10)
439:19;442:14;
469:8;486:16;526:5;
543:23;591:16;
686:4;724:22;726:8
designing (2)
437:15;594:1
desire (1)
509:8
desired (1)
694:17
Despite (1)
637:16
detail (6)
481:17,25;484:21;
532:11;571:11;576:1
detailed (4)
487:24;585:20;
629:15;707:21
details (7)
457:4;483:15;
484:17,18;550:12;
553:10;719:21
determinations (1)
618:6
determine (4)
580:5;596:24;
616:16;693:15
determined (1)
579:24
determines (1)
690:2
determining (3)
461:16;643:17;
694:13
develop (4)
514:22;569:18;
637:24;737:5
developed (9)
439:12;477:7;
526:21;531:13;
540:17;596:25;
643:3;671:11;703:25
developing (1)
703:2
development (3)
531:10;701:23,25
device (1)
447:19
dewatered (1)
537:2
de-watering (4)
485:25;519:9;
569:2;589:24
dialog (1)
693:20
differ (1)
483:12
difference (4)
440:25;511:25;
598:19;699:7
differences (3)
639:9;690:1;
708:12
different (39)
432:12;445:20;
461:14,17;484:24;
489:7;490:25;500:3;
532:16;534:4,24;
544:12;547:2;558:3;
578:22;586:22;
588:9;600:10;601:4,
7;626:6,8;638:12;
640:14,14;641:25;
654:1;656:12,13;
661:25;666:1;669:6;
673:6;697:21,21;
698:25;714:14;
719:10;722:22
difficult (3)
553:5;566:16;
673:10
difficulties (2)
537:4;545:5
difficulty (1)
442:19
diffusing (1)
549:3
dig (12)
461:24;484:20;
501:5;507:3;523:22;
524:3;548:22;
554:12;608:25;
619:18;620:19,22
digging (11)
457:11,16;458:1,6;
460:3,6,8;580:20;
618:9;620:18;729:11
dij` (1)
683:23
dike (3)
548:9;672:25;
673:17
diluent (1)
641:12
dimension (1)
583:18
dimensions (2)
445:21;679:7
dire (1)
697:8
direct (2)
546:24;663:3
directed (3)
541:3;621:7;
646:23
direction (4)
448:14;506:18;
548:1;561:12
directions (1)
617:11
directly (5)
448:19;450:19;
559:15;678:7;701:24
Director (1)
687:3
dirty (2)
652:16,25
disadvantage (1)
635:13
disagree (3)
630:10;631:3;
689:21
disconcerting (1)
693:22
discontinued (1)
559:8

discovered (4)
439:21;568:25;
682:1;701:20
discuss (5)
506:4;524:24;
557:7;564:10;737:19
discussed (5)
541:4;578:23;
595:1;705:6;714:5
discussing (1)
481:24
discussion (16)
476:3;478:4;
484:24;488:1;492:8;
495:6;555:10;566:1,
2;572:22;591:14;
599:19;607:8;660:8;
728:18;735:20
discussions (4)
482:10;491:15;
494:2;585:20
disparity (1)
652:10
disposal (1)
560:7
dispose (1)
679:21
disrupted (1)
683:11
disruption (2)
595:4;700:1
disseminated (1)
637:21
distance (1)
718:10
distinction (1)
641:5
distinguish (1)
640:25
distinguishing (1)
640:13
distributed (1)
736:6
distribution (2)
585:22;636:25
disturbed (2)
683:11;729:22
divers (1)
681:18
divide (4)
436:5;460:9,17;
486:8
divided (1)
461:7
dividing (1)
674:19
Division (1)
696:25
DOC (11)
499:9,16;500:11;
501:13,14;512:8,11;
569:11;655:4;717:2;
719:1
dock (2)
472:13;490:20
document (1)
610:1
documents (2)
531:13;713:15
dog (1)
446:24
DOH (1)
631:10
dollar (1)
514:13
dollars (1)
528:2
done (42)
443:2;451:22;
452:5;453:13;
462:13;477:12;
492:9,22;493:4;
494:19;495:2;
516:24;517:24;
522:1;524:6;535:9;
546:19;551:17;
582:6;621:23;
640:21;647:3;
651:14;661:5;
662:13,24;666:6;
669:4;670:20;
682:11;692:5;
695:22;696:9;
706:14;708:20;
713:5;719:2;720:4;
721:3,9;726:22;
727:4
dots (1)
727:12
double (2)
544:1;673:1
doubt (1)
583:12
dove (1)
567:12
down (90)
439:16;444:2;
449:12,18;450:3;
452:5,20;453:5;
454:2,11;457:20;
458:19;459:5,16;
460:23;462:21,24;
463:3,10;465:11;
467:3,7;470:5,8;
471:16;473:18;
479:12,13;482:14;
484:13,22;491:1;
495:5;497:1,17;
505:18;506:13;
507:3,5;513:5;516:7;
517:4;519:10;
524:23;540:14,16,
22,23;542:10;545:7;
546:22;547:10;
548:12;550:19;
551:3,23;570:23;
581:21,22;587:6,14;
591:4;593:12;595:7;
596:16;597:3,14,24;
598:6;603:20;
611:18;616:18;
627:9;632:12;
665:18;666:12;
681:18;682:20;
685:8;688:4;714:23;
716:1,8,22;718:21;
723:2;728:11;
729:10;730:3;734:22
downer (1)
737:17
down-river (1)
455:2
downstate (1)
504:22
downstream (35)
437:18;459:3;
469:19;506:6,12,18;
526:19;558:14;
562:20;572:7,13,19;
575:18;576:8,15;
578:7,16;579:1;
580:1;589:6;609:8;
627:3;629:7;631:24;
633:25;634:6;637:5;
667:24;668:1;
682:19;691:15;
693:17;700:21;
728:17;729:4
dozen (1)
600:7
dozens (1)
533:19
Dr (1)
543:7
draft (22)
446:17;462:4;
471:9,11,14,18;
478:10;509:7;
512:18;518:12,16,
21;519:4;521:11,14;
523:21;587:12;
593:18;689:12;
716:14;732:21;736:2
drained (2)
450:18,22
draining (1)
720:12
dramatic (1)
652:22
draped (4)
717:5,10;723:11,
15
draw (2)
480:19;726:23
drawing (2)
477:9;535:24
dredge (143)
441:17,24;446:5;
451:5,23;452:23,25,
25;454:11;455:16;
456:10,12,14,16;
457:12;458:9,11;
460:13,15,20;461:1,
10;462:6,7,17;464:5,
11,12,21;467:20;
470:18,20;472:10,
22,24;473:11,15;
475:5,20;476:6;
478:11,25;480:10;
482:12,17;486:6,18;
490:17;494:17;
502:17;506:5,23;
507:5;510:25;511:1,
6;512:15;516:19;
517:23;522:22;
523:3;524:21;525:5;
530:9;533:7;538:22,
25;539:21,25;
540:20;541:8,8,10;
543:1;545:17,23;
546:10;557:14;
562:3;570:13,18;
579:11;581:11;
584:7;585:6,8,10,25;
586:1,5;600:15,20;
606:17;608:21;
609:5,14,19;610:11;
612:25;613:1,2,3;
618:23;619:24;
620:6,25;631:25;
634:15,17;635:16;
648:24;652:25;
660:9,11,12;661:5,7;
662:10,12;664:21;
665:1;670:4;676:11;
714:7;715:10;716:1,
14,24;717:12;
721:16;722:8;
723:12;724:12,16,
24;725:2,4,6,7;
728:9,23;729:8,9
dredged (45)
438:23;439:25;
440:19;443:21;
452:3;455:1;460:10,
11,18;461:2,6,8;
464:14,16;469:13;
470:11;472:1;
475:12;480:25;
503:7;518:16;519:1;
523:7;525:6;537:13;
539:24;541:11;
556:4;557:17;572:6,
25;613:9;635:24;
643:19;652:23;
664:17;676:18;
680:7;682:8;690:10;
692:16;693:16;
695:25;712:1;716:17
dredger (15)
454:23;457:14;
458:11;465:10,19;
468:21;471:3;
472:19;477:8,11;
519:11;619:5;
620:15;668:20;732:4
dredgers (7)
444:8,18;447:2;
451:24;460:2,10;
533:18
dredger's (1)
467:6
dredges (24)
444:12;446:5;
447:5;452:2,10,18,
21;453:11;455:8;
460:4,19;461:7;
462:15,24;463:10;
464:2;479:18;
482:22;485:25;
487:2;511:12;588:5;
660:6,7
Dredging (193)
437:4,15,16,24;
438:14;439:4,8;
440:21;441:10;
442:2,24;443:18,25,
25;444:6,7,9;446:22;
451:11;452:5,8,15;
453:5,12;456:25;
459:17;460:1,3;
464:20,23;465:5;
468:4,22,25;469:15,
16;472:24;473:5,14;
474:25;477:13;
478:13,17;480:22;
485:24;486:13,17;
488:8;489:11;
490:18;492:6;
496:19;503:16;
506:12;507:13;
508:22,25;509:17;
510:20;511:15;
512:9;513:15;
518:23;519:3,15;
520:3;521:9,24;
522:14,21,25;
523:15;524:5,18;
526:10,12;533:14;
539:23;541:22;
542:22;543:10;
544:15,17,22;545:5;
549:7,10;555:19;
557:20;558:14,17;
562:21;565:23;
566:22;567:9,16;
570:8;573:25;574:1;
576:10;577:14,15;
584:2,13,18;585:23;
587:21;589:9,10;
597:23;599:20,22;
604:9,12,16;607:1,
13;609:4;610:15;
611:13;616:18;
618:23;619:1;624:5,

16;633:10,17;
634:16;638:5;639:1;
640:20;643:24;
651:14,16;653:5;
654:2;658:5;660:15;
661:2,10,11,18;
662:6,13,20,23;
664:20;667:25;
668:10,22;669:12,
20;676:15,22;679:7,
12,17,19;680:9,12,
14;681:22;682:14;
686:16;689:23;
690:3;692:13,20,23;
693:17;694:1,17;
696:6;699:16,17,23;
700:2,15,19;701:6;
702:15;707:9,10,12,
16;708:20;711:19;
712:3,15;714:8;
723:14;726:8;730:7
dredging's (1)
540:25
drift (1)
467:19
drill (1)
458:14
drinking (4)
579:21;636:14;
688:5;694:23
drive (2)
432:9;602:12
driven (2)
571:18;681:7
drivers (2)
550:25;585:2
driving (2)
575:10;730:9
drop (3)
448:6;477:14;
484:6
droplets (1)
666:17
drop-off (1)
594:10
dropping (1)
472:17
drops (1)
450:3
drove (1)
586:25
due (10)
455:25;545:8;
546:22;549:23;
550:19;551:23;
666:16;679:20,25;
699:17
dug (4)
457:21;478:18;
513:8;620:23
dump (7)
448:5,5,12,14;
450:20;465:25;
520:25
dumping (2)
448:16,17
dumps (1)
637:7
duration (5)
535:23;539:5;
562:25;585:14;709:2
during (50)
434:5;438:14,21,
25;439:10,21;
440:18;453:2;
463:22;485:23;
508:20;536:5;
540:15,15;541:4;
543:19,21,25;546:2,
5;547:24;548:13;
554:11;557:3;558:7;
560:2,21;561:25;
578:10;580:14;
584:3,13;589:23;
590:8;605:3;611:13;
624:12;702:16;
703:7;704:2;705:16;
706:9,14;707:4,11;
708:14,24;721:5;
727:9,18
dust (1)
664:19
dwell (1)
535:2
dynamic (1)
635:21
dynamics (1)
688:3
dynamite (1)
569:1

E

earlier (12)
442:5;471:1;
526:14;531:5;
546:16;555:10;
559:25;562:11;
574:9;582:25;
589:15;658:14
early (10)
538:25;539:21;
540:11;545:5;548:3;
549:4;584:25;600:2;
679:6;703:10
earnest (1)
733:17
ease (2)
442:23;514:11
easier (3)
432:7;524:2;659:8
easily (1)
614:21
East (11)
540:22,23;542:10;
547:11;548:9;
572:11;588:22,24;
589:11;672:25;729:5
eastern (2)
688:14;710:25
eat (1)
605:20
eaten (1)
482:19
eco-imagination (1)
684:20
economic (4)
678:16,22;711:8,
14
Ed (9)
483:8;558:8;
591:3;616:7;627:6;
636:2;638:17;660:4;
693:22
edge (1)
559:4
edges (1)
466:17
Edward (7)
437:7,21;438:1;
469:12,20;518:24;
528:10
effect (7)
484:2;586:21;
629:11;658:1;
668:11;700:3;701:7
effective (14)
452:21;456:21,25;
457:1,2,4;459:9;
483:16;559:11;
578:1;658:10;
660:20;661:19;
671:24
effectively (5)
482:24;483:2,24;
492:23;581:17
efficiencies (1)
550:12
efficiency (8)
536:20;554:24;
577:5;591:23;592:3,
11;598:5;602:19
efficient (10)
536:21;577:8,20;
591:25;592:15;
597:13;599:7;
601:22;683:21;
685:21
efficiently (4)
482:24;603:2;
608:1;655:13
effort (10)
489:6;490:9;
506:13;524:1;546:1;
571:25;577:9;652:2;
689:25;734:5
efforts (6)
479:25;531:24;
548:3;688:16;703:1;
734:14
eight (11)
472:11;474:22;
485:22;650:19;
658:16;674:21;
675:8,16;682:7,7;
696:22
eighth (1)
474:7
either (8)
462:8;490:6;
498:3;598:11;
617:15;629:5,8;
656:20
Electric (1)
684:22
element (2)
573:19;704:14
elements (2)
619:21;707:24
elevated (5)
536:1;546:16,23;
632:18,19
elevation (14)
470:6,7;600:4;
619:22;620:1;
716:20,21;720:7,22;
721:5,16;723:18;
724:3,17
elevations (2)
717:2;720:1
elicit (1)
591:13
eliminate (2)
596:4,7
eliminated (1)
658:6
else (9)
463:7;526:19;
529:1;593:19;
627:20;658:11;
712:10;731:3;732:12
elsewhere (1)
523:9
e-mail (1)
614:5
emanation (1)
624:4
EMC (1)
693:12
emergency (1)
437:16
emissions (2)
559:14;706:6
emphasis (1)
681:9
emphasize (2)
577:10;627:5
emphasized (1)
610:24
emphatic (1)
628:13
Empire (1)
678:3
employed (2)
687:8,16
empties (1)
464:7
empty (14)
459:25;463:6,18;
464:1;467:5;471:20,
20;472:7,9,14;
517:14,16,21;519:15
encounter (3)
601:6;644:7;
673:15
encountered (7)
510:14;555:16;
556:3,13;601:3;
620:7;714:25
encouraged (2)
556:1;608:14
end (59)
462:22;467:24;
468:20;470:2;
472:18;473:11,12,
17;474:24;477:15,
21,21;478:22;479:9;
480:5;481:9;484:12;
496:23;497:2;498:4;
501:6;503:15;511:6;
528:4;531:4,25;
533:25;534:21;
536:3;537:2;555:22;
559:13;560:10;
561:17;574:23;
582:25;589:4;
590:14;592:8;
600:15;612:3;
615:24;625:14,15;
644:6;645:21;
647:16,19;651:25;
655:10;662:17;
666:6,16;677:13;
683:11;700:6;
722:20;735:23;
737:16
ended (8)
438:1;466:21;
469:9;559:1;583:9;
584:22;604:18;648:8
end-to-end (1)
445:10
Energy (1)
686:6
engage (1)
556:2
engaged (2)
437:13;558:2
engine (1)
711:8
engineering (17)
440:13;481:21;
483:7;520:22;
527:21;534:17;
556:23;571:3;

617:16;625:6,16,25;
629:3;657:4;678:15;
707:25;724:8
engineers (3)
521:4;527:19;
567:12
enhance (6)
559:20;561:1,3;
563:11;660:15,23
enhancements (2)
559:22;562:8
enhancing (1)
559:24
enlarged (1)
721:25
enough (11)
439:20;446:17;
474:9;479:17,18;
487:25;524:3;675:1;
722:5;730:21;731:2
entered (2)
588:17;642:13
entire (13)
476:17;477:5;
522:7;542:3;605:1,5;
672:4;701:21;710:3;
711:13;719:3;724:3,
5
entirety (1)
541:16
entities (1)
615:3
environment (4)
514:15;685:11;
708:3;709:6
environmental (14)
433:13;489:11;
540:7;680:9,12;
685:8;687:4,6;697:3;
701:16;702:20;
703:6,22;712:3
environmentally (1)
695:16
envision (1)
630:13
envisioned (3)
486:12;676:10,19
EPA (134)
433:17,21;434:2;
436:23;437:3,5;
440:23;453:21;
474:1,20;476:23;
484:25;490:2;492:2;
494:2,4,23;496:17;
500:13;501:18;
505:15,22;508:1;
509:12,24;510:8,9;
514:22;521:22;
530:6;531:5,15,19;
534:9;535:13;536:5,
14;538:20;540:16,
18;541:2;542:23;
543:15;545:3;
549:18,22;553:18;
556:2;557:6,8,10;
558:18;559:7,18;
562:11;563:7;
566:25;570:22;
577:23;580:3,10;
582:24;583:3,10;
586:23;587:2;
601:10;602:1;
604:12;608:12;
614:17;615:5,6,17,
22;616:19;617:4;
618:15;619:8;623:1,
8,19;628:13;629:13;
632:4;639:25;
651:19,23;657:25;
663:10;664:4;665:5;
667:19;668:7;
676:14;681:20;
684:12;688:21;
689:13,21;690:5,7,
18;691:3,19,25;
692:2;693:1;695:9,
19;701:25;702:24;
703:2,25;704:21;
705:3;706:1,25;
713:1;715:18;
717:19,23;718:5;
723:5;725:15;
727:12,17;730:10;
735:4,10;736:3,6,20;
737:20
EPA's (16)
481:10;510:23;
521:15,25;526:2;
544:10;547:25;
552:1;556:14;
578:23,24;580:4;
589:23;617:12;
628:22;734:5
equal (3)
436:1;624:4;
692:10
equates (2)
553:17;650:18
equation (2)
578:6;719:13
equipment (26)
444:6;449:19;
452:16;464:23;
482:23;483:1;
486:23;501:15;
509:9;510:4,11;
516:12,15;517:1;
518:18;530:11;
533:11,22;547:14;
562:12;577:11,18;
586:22;592:12;
645:15;660:16
equitably (1)
608:23
Erie (2)
710:16,21
eroded (2)
641:14,18
eroding (1)
641:15
erosion (1)
641:12
err (1)
585:16
errors (1)
695:2
especially (3)
501:22;667:3;
672:6
essence (2)
535:7;611:3
essentially (11)
537:16;548:10;
565:19;586:3;609:6;
616:22;645:16;
698:16,19;722:3,9
established (6)
709:5;720:11,23;
721:2,5,8
estimate (13)
439:13,15,24;
440:13,20,23;
523:12;536:5;552:2;
574:10;595:10;
619:22;625:17
estimated (4)
690:25;691:17,21;
702:9
estimates (9)
452:23;535:13;
538:19;543:14;
549:22;574:5,12;
622:10;628:23
estimating (1)
611:8
et (3)
482:15;623:16;
686:12
evaluate (12)
500:24;505:9;
576:20;623:14;
626:13;629:1;
638:13;656:14,17;
663:19;665:19;
702:25
evaluated (2)
525:22;672:3
evaluating (1)
596:8
evaluation (9)
487:24;526:2;
563:8;594:18;654:4;
656:13;707:15;
708:23;734:25
even (21)
438:7;449:17;
471:9;502:5;510:2;
524:8;535:16;539:6;
544:3;545:2;546:11;
578:20;604:15;
647:15;655:3;
664:25;676:12,23;
682:20;699:9;725:24
evening (1)
432:6
evenly (1)
467:21
event (8)
438:5;455:5;
457:18;463:22;
584:14;634:5;
636:10;641:11
events (1)
634:7
eventually (2)
679:9;682:19
everybody (6)
432:5;489:2;
491:18;589:14;
663:9;673:22
everybody's (1)
509:19
everyone (6)
432:1,20;530:17;
674:7;709:14;722:23
everywhere (1)
480:15
evidence (8)
620:2;629:16;
633:24;664:14;
667:8,20;670:5;
715:16
exactly (5)
442:15;570:7;
608:2;610:11;728:25
examine (1)
626:14
example (15)
526:24;568:22;
569:11;571:10;
576:7;581:10;604:8;
607:6;608:9;634:4;
664:23;721:22;
722:25;724:9;731:11
examples (1)
729:22
excavator (4)
447:19,22;448:1;
646:4
Excavators (2)
444:10,14
exceed (1)
574:7
exceedance (2)
540:13;557:5
exceedances (1)
604:6
exceeded (6)
454:4;557:3;
571:20,21;573:1;
616:16
excellent (1)
695:8
except (1)
718:16
excess (4)
511:8;584:3;
621:2;692:14
excessively (1)
697:8
exclude (1)
627:23
excludes (1)
454:25
Excluding (1)
452:8
exclusive (1)
440:20
excuse (2)
455:14;620:11
execution (1)
531:10
exercise (2)
553:20;671:15
existing (6)
617:16;643:17;
649:16;680:14;
706:7;710:2
expandable (1)
641:10
expect (4)
440:9;476:11;
639:22;665:6
expectation (4)
488:25;489:13;
492:20;664:12
expectations (1)
510:10
expected (3)
691:7;692:22;
703:13
expects (1)
703:16
expensive (1)
679:20
experience (10)
517:6;553:22;
558:10;559:9;563:5;
586:15;625:21;
639:12;647:20;706:4
experienced (2)
540:12;561:22
experiences (1)
532:4
experimented (1)
558:24
expertise (1)
596:23
experts (1)
598:20
explain (2)
485:11;682:22
explained (1)
586:17
explicit (3)

485:14;663:13,15
explore (1)
454:18
export (2)
630:13,14
exposing (1)
694:3
exposure (4)
622:11,22;629:11;
685:22
expressed (2)
693:19;696:5
extended (2)
555:8;633:14
extending (2)
686:12;716:8
extends (1)
535:25
extension (1)
709:1
extensive (5)
457:5;578:13;
658:19;680:24;704:3
extent (5)
554:6;574:20;
617:10;651:15;
693:16
extra (5)
493:2,3;508:9;
546:1;674:24
extracted (1)
514:21
extrapolate (2)
574:11;719:19
extrapolated (1)
719:13
extremely (1)
525:7

F

face (2)
561:10;648:1
facilitating (1)
738:12
Facilitator (1)
433:11
facilities (2)
688:10;695:6
facility (12)
521:20;525:23;
527:12;550:18;
553:7;556:10,20;
560:7;562:9;565:5;
584:1;594:10
facility's (1)
559:24
fact (21)
449:21;467:10;
514:12;518:1;
541:24;545:25;
552:1;566:3,6;
567:20;578:16;
590:4;616:6;624:11;
633:24;643:16;
668:11;692:18;
722:18;730:16,19
factor (10)
465:3;468:3;
554:18;571:18;
589:19;590:20;
593:1,2;626:2;
710:23
factored (1)
655:9
factors (13)
446:21;532:6;
546:14;570:23;
571:7,12;586:20;
588:16;591:5;596:9;
607:6;626:15;694:6
facts (2)
566:11;697:9
fade (1)
679:9
failures (1)
527:18
fair (5)
436:1;590:13;
647:3;651:22;673:13
fairly (4)
432:18;478:19;
603:15;669:14
fall (3)
479:13;533:8;
545:1
falling (2)
472:15;670:6
falls (3)
569:3;703:11,19
family-owned (1)
710:5
fan (1)
514:25
fancy (1)
727:8
far (12)
446:24;474:18;
479:20;500:22;
542:4;545:23;
616:12;632:24;
638:12;694:22;
696:16;698:10
far-field (3)
578:17;658:12;
659:1
Farley's (1)
625:3
Farrar (3)
701:12,13,14
fashion (4)
515:4;606:12;
617:8;629:16
faster (1)
553:15
fatalistic (3)
514:8;564:15;
667:19
fatality (3)
529:23;530:7;
584:15
favor (2)
473:4;508:21
feasibility (1)
560:16
feature (1)
698:9
February (4)
677:23;733:20;
735:2,8
fed (1)
526:16
feedback (2)
717:20;725:16
feeder (1)
700:24
feel (4)
535:4;669:17;
683:22;719:18
feet (49)
445:1,2,2,6,6,7;
446:10;454:11;
458:14;461:24;
462:4;467:11;
469:13,14,15,22;
470:8;477:10;
480:19;498:5;499:2,
3;511:18;513:5,7,7,
7;518:17;519:2,10;
523:5,12,12,21;
527:5;552:21;
558:13;608:24;
609:7;714:13;728:1,
2;731:7,8,14;732:3,
5,6,9
fell (2)
441:14;448:9
felt (3)
440:5;662:12;
682:11
Ferrara (1)
696:21
few (19)
432:17;443:20;
444:14;452:8;453:7;
460:2;468:25;476:7;
490:25;505:23;
535:3;622:3;628:17;
636:3;653:7;656:21;
660:7;700:20;729:21
fewer (1)
655:14
fiber (1)
647:24
field (17)
441:7;474:1;
494:20,25;501:4;
502:20;504:11;
534:9;567:4;581:21;
616:12;638:10;
650:9;659:3;727:6,
10;734:8
fields (2)
501:7;654:23
fifth (3)
598:3;599:5;
686:17
figure (6)
449:7;479:21;
564:21;575:17;
592:18;627:6
figures (4)
452:6;546:11;
613:5;697:20
figuring (1)
459:22
fill (6)
448:21,24;450:1;
462:12;519:22,22
filled (9)
437:19;447:4;
463:6;465:7,14;
466:12;517:11;
520:18,19
filling (5)
450:5;465:9;
471:13,21;518:2
filter (5)
451:2;459:6;
525:24;527:2;647:19
filters (1)
672:11
final (22)
442:4;468:5;
472:20;484:19;
494:1;496:4;510:8;
526:22;531:19;
593:9;599:14;610:5;
611:16;617:9;
629:18;663:7,13;
733:9,19,21;734:24;
736:5
finalize (1)
513:22
finally (5)
505:24;520:6;
577:24;738:4,10
find (15)
460:11,24;473:8;
499:25;504:5;
511:23;513:6,17,18,
18;534:25;636:15;
659:13;664:7;692:11
fine (25)
436:16;447:14;
468:6;477:23,23;
479:9;480:5,7;
481:17;489:25;
495:13;498:8,9,15;
499:12,17,21;
500:19;506:10,10,
15;512:9;528:3;
638:9;683:16
finger (1)
716:7
finish (2)
492:17;496:19
finished (5)
476:21;479:5;
542:10,16;545:21
finishing (2)
479:6;584:18
firm (4)
437:13;495:22,24;
500:14
firmly (1)
567:7
First (76)
435:13;437:5,19;
438:14,22,25;
442:10;445:12;
450:10;470:20;
473:12,18,20;
474:24;480:6,8,18;
485:9;491:4;492:6;
500:8;507:6;540:12;
542:15;543:9,10;
546:15;549:6;
550:11;554:24;
562:20;567:6;
575:16;580:21;
581:5;584:5;588:20;
592:19;597:20;
599:4,6;612:24;
613:14;615:1,6;
616:12,14,23;617:4;
620:6;622:6;628:11;
629:13;632:11;
633:7,17;642:8;
657:3,15;660:18;
665:4;671:4,6;675:6,
19;687:14;691:12;
696:14;702:6;
707:12;714:2,7,15,
25;724:24;725:18
first-rate (1)
516:20
fish (16)
492:10;536:1;
576:12;582:2;
624:19,22,25;
626:25;630:25;
697:1,5,19,20,24;
700:20;701:1
fit (3)
584:22;698:13;
699:19
fits (1)
700:10
fitting (1)
698:12
five (47)
439:5,7;441:22;
443:2;444:1,9;460:4,
10;461:21,23;

462:13;468:14;
469:15;477:22;
480:1,14;483:6;
486:16;491:18,19,
22,25;492:18,24;
493:5,12,17,22;
494:5;496:25;513:7;
523:19;525:13;
535:8;544:15;
562:24;581:25;
582:4;588:16;643:5;
648:13;653:9;660:6;
697:22;698:6,23;
708:9
five-beyond (1)
471:3
five-yard (6)
444:18;447:20;
448:22;461:1;
462:12;464:11
five-year (2)
439:6;535:17
fix (2)
468:1,1
fixed (1)
683:16
flaps (1)
437:12
flat (3)
504:7;603:13;
717:7
flats (1)
523:18
fleet (3)
453:1;461:5,6
flexibility (2)
592:6;732:24
flexi-floats (1)
593:16
flight (1)
675:4
flipping (1)
457:13
floods (1)
569:16
flow (18)
454:10;496:12;
548:11,14;549:1;
634:5,7;636:6,7,9,
10;671:17;672:16,
19,22;673:17;
728:16;729:7
flow-related (2)
548:6;549:2
flows (6)
454:5,6;455:6;
460:24;525:7;545:6
fluctuate (1)
552:20
fluctuation (1)
593:22
fluctuations (1)
548:16
fly (3)
497:6;514:25;
517:25
focus (8)
495:3;532:17;
574:24;583:3;603:1,
2;607:8;618:8
focused (2)
559:21;602:25
focusing (1)
713:19
fog (2)
453:3,5
folks (7)
432:17;435:8,13;
515:15;574:19;
583:6;614:13
follow (4)
458:20;531:5;
649:23;686:18
followed (4)
596:25;643:16,21;
648:17
following (5)
444:8;495:10;
628:22;688:25;729:7
follows (2)
665:1;729:16
follow-up (6)
513:21;594:22;
608:19;667:5;
669:17;670:14
fool (1)
513:16
foot (42)
446:13;450:4,14;
466:11,16,22;
468:23,23;471:9,11,
14,18;474:8,18;
478:9;508:8;519:7,
19,20;520:8;548:16;
600:4,5;601:25,25;
602:3,3,4,4,12;
649:10;651:17;
656:15,15,16;
663:18;679:13;
680:11;717:13,13;
724:10,10
footing (1)
584:9
footprint (1)
555:19
footprints (1)
610:17
Forage (2)
697:20;701:1
force (2)
639:5;730:9
forces (1)
551:22
forecasts (1)
626:3
forget (1)
627:13
form (2)
515:3;641:8
formed (1)
723:8
forms (1)
688:13
formulate (1)
630:6
Fort (5)
438:1;469:12,19;
518:24;528:10
forth (6)
505:23;588:6;
636:19;666:21;
672:14;691:19
forthcoming (1)
735:10
fortunate (1)
567:15
Fortunately (2)
558:4;566:10
forward (21)
484:21;553:2;
557:8;563:4;569:6;
582:13,15;584:19;
592:2,13;593:7;
601:22;627:21;
647:2;650:24;659:5;
684:18;709:9;715:2,
5;727:22
foul (1)
496:20
fouled (1)
459:4
found (17)
469:24;470:3,4;
538:20;547:3;560:4;
581:3;596:18;621:2;
635:21;662:14;
681:25;683:5;
691:23;693:21;
699:1;716:11
four (31)
442:10,16;445:24;
460:4;464:6;468:13;
471:9;472:21;473:5;
474:18;477:22;
480:9;496:2;511:6;
513:5;519:2;526:17;
550:19;554:22,23;
567:11;570:16;
571:21;578:10;
594:4;613:11;
614:16;669:25;
697:11;722:14;
724:10
fourth (6)
573:13;597:11,19;
598:2;599:5;686:17
FOX (16)
495:9;497:4,18;
498:15,18,23;499:4,
14;500:7;501:20;
502:22;525:19;
645:23;651:6;657:2,
16
frame (3)
695:15;708:8,10
frames (2)
708:13,15
frankly (2)
570:24;615:25
free (1)
450:13
freeboard (1)
466:22
frequency (1)
693:24
frequent (1)
441:1
Friday (3)
568:24;631:5;
735:1
front (6)
432:4;434:6,18;
435:23;625:10;
674:14
frustrating (1)
558:10
FS (1)
708:14
Ft (2)
437:7,21
fueling (1)
452:19
FUGLEVAND (32)
485:8;487:3,22;
488:13,18;491:13;
493:6,25;537:25;
538:7;554:17;
585:18;586:8;
592:17;593:10;
594:6,20;612:18;
614:4;620:11;
631:20;632:3;
646:14;663:6;
712:12;716:18;
723:15;724:2;725:9;
728:8;731:5;733:13
fulfill (1)
663:22
full (15)
439:4;466:7;
476:25;484:2;501:7;
507:21;534:2;597:3;
615:14;640:23;
645:18;651:15;
658:11;698:23;
711:12
fully (6)
499:20;571:1;
630:2;633:22;666:7;
680:13
fun (1)
484:9
function (1)
578:8
functionality (1)
640:16
Fund (2)
433:13;688:18
fundamental (5)
565:6;568:1,6;
597:18;606:14
fundamentally (4)
553:13;560:3;
616:4,8
further (9)
509:20;535:25;
539:6;604:3;617:6;
652:12;654:5;
676:24;678:11
future (9)
545:24;608:16;
626:12;679:2,3;
684:3;691:10;
694:25;715:10

G

gadgets (1)
436:21
gallon (1)
450:12
gallons (1)
489:20
gap (1)
477:17
Garon (6)
432:24;434:13;
733:1,3;734:19;
736:14
GARVEY (14)
623:24;624:22;
625:1,22;636:4;
637:1;640:6,22;
642:17,20;660:4;
661:12;725:17;
730:12
Garvey's (1)
693:22
gassed (1)
456:9
gather (1)
674:11
gathered (3)
642:23;703:6;
720:11
gathering (1)
605:2
gave (7)
465:4;473:25;
477:8;489:5;609:22;
697:7,13
GE (117)
433:22;434:2;
438:2;439:12;440:1,
18;441:8;444:7;

445:14;449:24;
452:23;453:10;
456:18;457:4;
461:18;463:21;
469:1;471:22;473:1,
21,23;474:14;
477:24;478:1,7;
480:24;484:4;
486:15;489:9;490:2;
491:9;492:16;494:3,
7,16,25;495:16;
496:16,22;500:6;
501:18;505:21,24;
506:4;507:17;508:3,
6;510:24;511:7;
513:3,23;514:22;
516:11,24;521:4;
522:21;523:23;
524:10;525:20;
527:19;530:1,6,8,24;
531:13;532:13;
582:20,25;583:3,4,
24;615:6,17;617:4;
618:24;622:8;623:1;
626:18;629:12;
632:1,3,23;637:12;
640:3;646:23;652:3;
662:7;663:10,10;
667:16;671:6;676:4;
680:7;681:20;
688:21;689:13,21;
690:5,11;692:11;
693:6;695:8;697:7,
10,25;698:19;
703:11,19;712:2;
718:5;727:17;734:5,
24;736:3,6,25;
737:22
geez (1)
477:3
general (5)
573:15,17;580:17;
614:2;684:22
generalizations (1)
481:18
generalized (1)
524:18
generally (4)
460:3;477:14;
506:16;526:8
generate (2)
581:13;734:14
generated (6)
566:9;567:17;
708:14,16,24;730:2
generating (1)
729:15
Genesee (1)
710:19
gentlemen (1)
675:3
geo (1)
647:24
geology (1)
442:18
geophysics (1)
513:11
George (3)
686:1,25;687:2
geo-tech (1)
648:6
germane (1)
618:1
GE's (11)
441:4;445:12;
457:22;459:7;
484:18;631:9;676:1,
11;677:2;700:25;
712:14
gets (6)
492:7;578:7;
589:5;657:20;
664:15,15
Gibson (31)
433:24;484:4;
514:4;530:23,25;
531:3;538:4,9;542:2,
18;550:6,10;551:14;
554:18;562:19;
583:24;597:22;
598:11;599:15;
604:3;607:18;609:4,
18,23;619:3,19;
620:5,24;657:22;
660:4;662:8
given (17)
488:16;507:20;
514:14;516:18;
568:12,16;592:21;
617:17;618:4;
642:12;651:19;
693:5;706:24;708:3;
717:12;723:13;
724:13
gives (4)
523:21;656:16;
691:13;724:18
giving (3)
449:12;632:13;
646:12
goal (9)
573:8;579:2,2;
690:6,8,10,13,14,21
goals (2)
654:6;702:25
goes (8)
479:21;576:10,15;
603:18;632:8;
664:21;668:2;675:6
good (37)
432:6;433:15;
436:25;440:12;
442:25;473:3;489:6;
495:6;499:18;
527:19;555:9;
561:11;569:10;
570:1,5,18;574:9;
575:21;590:18;
591:17;599:23;
603:7;609:11;
618:20;658:16;
665:12;668:12,17;
669:9;684:17;687:1;
700:1;709:13,14;
710:10,10;734:17
government (1)
711:17
GPS (1)
516:12
grab (6)
497:1;725:24;
726:2,4,7,11
grabbed (1)
726:9
grade (15)
447:24;468:15;
473:7,8,19;479:9;
496:5,14;499:12;
506:10,15;507:12;
597:4,4,5
grading (10)
447:14;468:6;
477:23;480:5;
495:13;498:8,9,16;
499:17;511:16
gradually (1)
540:24
grain (1)
638:9
grams (2)
622:16,20
granted (1)
543:22
graph (5)
539:8;631:21;
632:1,3;716:12
graphic (1)
612:24
graphics (3)
612:23;613:14,20
grappled (1)
729:24
Grasso (1)
680:16
grateful (1)
432:6
gravel (1)
526:10
gravels (1)
526:11
great (12)
432:11;484:6;
492:25;533:13;
542:17;568:22;
601:19;633:20;
678:18;685:23;
711:1;732:22
greater (9)
535:14;654:16;
676:12;690:5,20;
691:24;692:10;
698:10;701:4
greatly (4)
574:6;702:10;
731:10;734:4
green (1)
531:18
Greene (3)
677:17;680:21,23
Greg (12)
432:12;456:20;
495:7;502:23;
508:14;596:12;
617:1;646:17;
656:25;660:2;
670:12;731:20
Greg's (1)
608:20
grew (1)
437:15
grid (8)
468:24;499:3;
656:15,16,18;
718:24;719:2;721:11
grids (1)
656:11
Griffin (4)
506:11;526:23;
540:24;547:11
grizzly (6)
448:3,8,10,11,17;
459:2
grocery (1)
710:8
gross (1)
481:18
ground (7)
435:6,12;481:13;
482:11;674:13;
737:18,24
groundwork (1)
632:22
group (4)
566:24;567:10;
582:7;687:6
guess (11)
471:5;509:8;
510:5;513:20;622:8;
629:12;637:3;640:6;
671:21;684:11;
730:13
guesstimate (1)
440:16
Guidance (6)
509:24;617:23;
618:8,12,15;688:21
guide (2)
576:4;707:5
guideline (1)
617:21
Guidelines (2)
617:13,23
guides (1)
581:9
guiding (1)
702:17
guy (1)
519:23
guys (11)
481:5;485:6;
498:19;504:23;
609:22;614:14;
615:23;625:8;
647:11;696:16;
717:20

H

habitat (1)
676:20
hackles (1)
591:12
Haggard (26)
532:24;552:6,10,
11;564:4,5;574:18;
575:14;591:10;
601:18;602:18;
604:21;605:17;
611:22;613:19;
614:6;617:22;
626:20;630:2;
643:15;645:4;648:2;
657:17;667:18;
670:1;712:23
half (22)
433:20;444:1;
450:5,14;467:1,6,7;
468:9;471:19;
486:12,16;497:25;
498:1;507:23;
517:15;527:9;
529:14;544:15;
600:7;636:13;695:5;
699:4
Halfmoon (1)
688:7
halfway (3)
512:3;519:17;
523:3
hand (5)
487:9;510:23;
590:6;641:22;677:13
handle (10)
451:13,15;471:11;
483:23;521:4;526:5,
7;528:22;659:14;
666:2
handling (1)
527:13
hands (1)
432:16
hanging (2)
437:10;446:8
happen (10)
458:18;506:9;

514:25;531:22;
568:24;569:24;
590:24;618:19;
734:21;735:8
happened (11)
473:10;523:4;
584:23;587:17;
591:6;592:8;610:10;
621:11,25;684:5;
685:6
happening (2)
477:18;605:1
happens (8)
477:25;506:15;
521:18;592:4;634:4,
15;670:3;691:16
happy (3)
508:1;614:8;
656:19
hard (10)
495:24;519:25;
531:25;566:13;
646:12,15;666:1;
687:10;728:25;
734:11
HARTMAN (15)
456:21;457:17;
502:25;505:13;
508:16;596:14;
609:21;618:22;
619:9;620:3;660:3;
661:18;663:4;732:2,
7
hatch (1)
731:24
hate (1)
610:17
haul (1)
450:20
hauling (1)
438:3
havoc (1)
526:16
headed (2)
543:12;560:15
heads (1)
602:15
health (5)
514:16;685:12;
702:19;708:2;709:5
hear (16)
432:22;435:10;
455:12;456:2;487:9;
488:1;494:4;556:2;
582:23;583:4;
608:14;609:12;
614:7;666:11;671:5;
677:1
heard (23)
468:11;491:14,18;
494:1;535:12;541:4;
544:19;545:25;
554:1,20;562:11;
580:25;583:14;
586:24;591:15;
592:20;615:21,23;
628:17;635:7;647:4;
657:8;680:25
hearing (7)
487:15,17;489:2;
521:22;615:2;
618:11;709:9
heartland (1)
710:22
heavy (3)
462:6;662:2;
735:25
Hello (1)
701:13
help (14)
491:4;502:14;
549:3;573:19;
575:23;592:16;
593:11;639:16;
640:1;661:3;670:25;
675:17;693:15;
704:24
helped (1)
564:21
helpful (6)
604:24;612:20;
658:3;672:6;725:10;
734:12
helping (2)
478:10;604:25
Herculean (1)
734:5
here's (1)
586:25
hesitant (1)
524:16
high (48)
445:19;446:11,25;
454:5;455:6;460:12,
23;472:16;476:24;
478:11;479:14;
480:12;488:24;
498:6;525:7;533:14;
541:9;545:6;548:13;
557:13;569:16;
581:2,4;593:21;
605:14;625:14;
634:5,7,9;636:6,7,8,
10,12;653:9;668:23;
669:13,14;672:6,22;
673:16;681:10;
694:4;698:10;700:6;
703:21;714:1;722:5
higher (8)
442:2;464:20;
518:18;548:13;
550:11;553:25;
578:12;626:3
highest (1)
672:19
highly (3)
604:10;666:24;
672:22
hindered (1)
471:6
hindsight (1)
480:25
hired (1)
596:24
historic (2)
678:1;710:15
historical (1)
703:7
history (3)
438:6;678:15;
711:6
hit (20)
463:23;468:21,25;
470:5;491:12;
526:14;537:19;
540:10;546:11;
551:12;553:17;
619:13;620:6;
621:10,23;627:9;
643:18;655:3,5;
668:20
hitting (1)
491:9
Hodgson (7)
686:1,25;687:1,2;
694:11;696:4,12
hold (10)
455:3;456:2;
466:22;492:24;
506:20;570:23;
575:13;582:24;
651:20;683:14
hole (2)
609:1;647:8
holidays (1)
452:8
HOLLAND (95)
432:1,23;454:15;
455:3;456:1,20;
468:9;479:2;485:3;
495:7;502:23;
508:12,17;515:8,15,
21;518:7;525:12,17;
528:20;529:9;
530:14,22;531:1;
549:15;552:8;554:9;
574:16;575:12;
582:18;596:12;
601:13;602:16;
605:25;606:7;
608:18;612:17;
613:25;614:9,24;
617:1;620:8;622:1,5;
626:17;628:8;632:1;
638:15,21;643:12;
646:5,16,21;651:18;
655:23;656:3,21;
657:14,18;660:2;
662:7;663:5,24;
665:3;667:15;
669:24;670:12;
671:3;673:22;674:7;
677:10;680:20;
685:25;686:20,23;
694:10;696:2,11,19;
701:11;709:11;
712:5,17;713:18;
717:14;718:3;
720:19;722:11;
725:15;728:6;
730:10;731:3,20;
732:11,22
home (1)
738:14
honest (1)
640:10
honor (1)
436:18
hope (5)
432:5;434:16;
505:11;515:3;566:6
hopefully (6)
432:13;501:18;
512:19;627:4;
649:19;674:12
hoping (1)
508:22
hopper (9)
444:21,25;446:2,
15;586:12;588:19;
589:3;594:7,12
hoppers (4)
587:10;588:8;
591:7;592:24
horizontal (3)
537:24;538:12,15
horsepower (1)
445:23
host (1)
482:13
hot (3)
476:7;511:2;
524:22
hotels (1)
710:6
hour (33)
433:20;434:1,11;
449:4,11,12,14,16;
450:7;460:11,14,16,
25;461:9;464:8;
467:1,5,5,7;468:9;
471:19;517:15;
549:25;582:21;
590:18;597:24;
613:20;614:7,11;
615:14;674:3;675:1;
724:13
hours (39)
447:2;452:10,11,
12,14,15,24;453:3,7,
12;454:1,14,20,21,
22,25;455:7,20;
456:16,22,23;
457:10,20;460:5,19;
461:5;464:1,4,6,15;
474:22;517:16;
520:9;533:24;
544:17;549:23;
558:2;584:3;658:16
house (2)
663:16,18
Hudson (26)
437:4;474:1;
484:5;514:4;533:4;
553:4;568:21;631:2,
9;634:18,19;682:20;
683:10,13;687:13,
22;688:13;690:3,22;
692:2,5;695:19,22;
701:19;703:11,19
huge (5)
481:15;648:7;
650:13;658:20;668:4
hugging (1)
668:14
human (7)
514:16;528:10;
531:24;685:12;
702:19;708:2;709:5
hump (4)
458:17;480:11;
498:2;519:8
humps (2)
497:13,19
hundred (1)
550:1
hundreds (1)
637:8
hung (1)
459:2
hydraulically (1)
465:16
hypothesis (1)
628:1

I

ice (1)
585:11
iceberg (1)
665:14
idea (5)
441:6;492:15;
561:11;611:17;
700:21
ideal (1)
685:14
ideally (1)
621:19
ideas (1)
500:3
identified (4)
619:5;689:17;
704:2;726:14
identify (3)

515:25;621:19;
704:15
ignored (1)
698:2
ill (1)
514:10
image (1)
724:19
imagine (2)
518:13;585:10
immediately (3)
473:2;674:1;
693:17
immense (1)
655:17
imminently (1)
736:20
impact (28)
435:4;492:10;
496:10;532:19;
535:25;541:14;
546:24,25;590:22;
598:16;624:8,15,20;
627:14,18;631:8,14;
633:1,3,6,10,17;
634:2;636:19;
652:22;685:3;
688:23;690:3
impacted (4)
549:14;572:2;
591:6;704:6
impacting (4)
522:16;579:14;
603:23;695:16
impacts (18)
468:4;522:18;
541:16;545:9;
547:12,22;548:24;
559:12;594:23;
600:12,13;604:14;
623:15;628:4;
634:19;691:10;
702:11,23
implement (2)
564:1;706:8
implement-able (1)
577:1
implementation (1)
707:3
implemented (5)
531:20;547:24;
557:1;563:25;666:22
implementing (3)
535:12;541:1;
556:14
implication (1)
489:8
implications (5)
514:14;532:8;
583:23;629:4,22
implied (1)
652:9
implies (1)
734:24
imply (1)
440:12
importance (2)
678:21;688:1
important (30)
434:19;440:3;
509:21;510:7;
535:18;571:14;
572:4,4,15;576:24;
577:6;578:4;581:25;
616:4,24;623:12,21;
627:4;641:5;662:4;
667:21;668:16;
681:1,4;688:23;
689:24;704:14;
706:12;711:18;
733:22
importantly (3)
536:17;545:2;
571:16
imposed (1)
624:18
impossible (1)
490:8
impregnated (1)
671:18
impromptu (1)
732:16
improve (16)
480:2;494:3,6;
520:1;534:4;548:1;
562:9;592:3;594:9;
660:23;661:10;
702:18;704:11,24;
705:1,10
improved (1)
640:4
improvement (1)
596:1
improvements (3)
611:19;693:4;
707:5
improving (2)
484:14;522:6
inability (1)
447:3
inaudible (2)
455:25;542:1
inaudiblethey're (1)
446:1
incentive (1)
685:5
inch (16)
474:3,6,6,7;475:4,
15;476:4;511:20,24;
593:24;599:25;
619:12;621:5;645:2,
9;723:1
inches (36)
448:23;450:4;
468:23;472:23;
473:8;475:10,15;
480:12;501:3;
503:18;507:19,19,
22;511:7;512:1,2;
519:10,14,21,22;
525:8;593:24;
620:20;653:18;
654:13,14;655:8;
714:23;715:11;
716:5;718:20;
720:14;722:9;
726:12,14;731:15
incident (4)
584:5;604:1,22,24
include (3)
455:15;713:10;
737:6
included (4)
435:23;547:17;
676:4;708:17
includes (4)
435:17;543:22;
675:23;704:5
including (4)
492:6;697:12;
707:2;737:10
incompetence (3)
587:1,3,4
incomplete (6)
490:25;501:1,10;
502:16;719:7,9
incorporated (1)
689:7
incorrect (1)
697:8
increase (16)
451:19;534:21;
540:9;543:2;551:18;
554:6;573:9;575:3;
579:3;582:2;596:3;
598:9;603:22;
626:25;632:6;676:5
increased (13)
477:16;536:2;
548:15;595:12;
622:11;689:22;
690:18,23;692:4,6;
695:18,21,23
increases (4)
540:3;632:15;
683:9;703:14
increasing (8)
539:23;540:4,6;
572:1;595:6;630:15;
633:11;688:17
incremental (1)
565:2
incumbent (1)
494:23
indeed (1)
615:16
independent (6)
551:16;552:2;
566:23,25,25;567:7
indicated (2)
623:8;722:3
indicates (1)
668:13
indicating (4)
478:14;479:2;
574:17;729:9
indication (2)
601:20;667:13
indicative (1)
669:11
indicator (1)
664:7
indicators (1)
669:12
indirect (1)
546:25
individual (3)
582:7;611:6;642:1
individually (1)
447:8
industry (1)
567:1
ineffective (1)
455:20
inefficiencies (1)
577:19
inefficiency (1)
599:9
inefficient (3)
571:23;581:20;
647:21
infiltration (1)
631:12
influence (2)
546:14;723:25
influenced (2)
532:7;541:25
influences (1)
635:19
inform (3)
650:24;659:4;
682:2
information (31)
434:19;453:24;
514:20;516:6,22;
524:11;534:11;
565:20;566:3,9,13;
573:24;582:16;
605:3;628:2,3;630:3;
634:12;636:8;
642:23;650:14;
659:11;684:17;
686:4,19;689:12;
713:7;715:15;735:6;
736:9,19
informational (1)
608:20
informed (2)
575:21;657:12
informing (1)
658:3
INGLES (1)
586:2
INGLIS (15)
610:8,21;713:22;
717:1;721:18;
722:14,18;723:21;
724:4;728:15;729:6,
18;731:9;732:4,9
inherent (2)
577:18;583:20
initial (4)
442:3;469:20;
473:13,19
initially (4)
445:7;471:4;
600:1;641:9
initiate (1)
615:9
injuries (1)
529:24
inland (1)
678:12
inns (1)
710:7
input (2)
717:24;735:6
insight (2)
633:9;734:17
inspect (1)
667:9
installed (1)
547:10
instance (2)
575:16;621:12
instances (1)
642:2
instead (4)
464:5;602:4;
684:21;715:5
instructed (1)
507:7
instrumental (1)
710:24
insure (1)
680:11
intake (4)
450:15;615:22;
631:12;636:14
intended (6)
536:22;546:4;
554:14;579:20;
708:1;737:25
intensity (1)
574:1
intensive (2)
657:6;689:15
intent (6)
502:11,11;503:19;
591:21;594:14;
705:12
intention (3)
491:8;580:13;
640:22
intentionally (1)

590:5
interactions (1)
576:20
interest (2)
685:7;696:5
interested (2)
515:23;665:7
interesting (6)
494:11;603:8;
635:15;636:7;
648:24;696:9
interests (1)
709:20
interim (1)
681:15
Interior (1)
675:24
intermediate (3)
539:3;610:5;
723:16
interpolate (1)
719:8
interpolated (1)
718:22
interpolation (6)
714:4;718:11;
721:9,10;723:19;
727:8
interpolations (1)
720:3
interpolative (1)
727:11
interpretation (2)
616:20;727:13
inter-relationship (1)
681:2
interrupt (1)
455:14
intimately (1)
679:4
into (74)
437:15;439:3;
441:23;442:19,25;
448:7,9,15,18,19;
450:19,20;458:5,17;
459:10,14;461:7,15,
20;477:11;478:1;
483:19;484:20;
489:18;496:25;
512:23;513:13;
523:13;526:16;
532:10;539:6;543:5,
23;545:24;548:22;
552:17;554:4,13;
556:16,18,21;
567:12;569:4;577:6;
583:1,5,22;586:20;
588:17;590:4;610:3;
614:2;620:16;
626:15;642:13;
652:12;653:3;655:9;
679:9;682:20;
685:19;689:7;
694:18;695:19;
705:15;706:19;
713:15,21;717:6;
724:15;729:16;
732:13;735:7;738:9
introduced (1)
469:5
introduction (1)
432:18
invariably (1)
483:10
inventory (12)
473:14;482:13;
499:13;539:14,18,
24;540:2;628:24;
637:24;696:1;
730:16;731:1
inverse (1)
718:10
investigation (1)
682:3
involved (9)
437:5;502:7;
680:1;687:12;
696:15,17;701:17,
24;722:24
involves (1)
500:5
involving (1)
455:17
irrelevant (2)
551:20;562:10
Island (28)
454:3,6;462:3,22;
467:2;506:11;
522:23;526:24;
540:22,24;547:11;
555:23;562:18,19,
21;588:22,24;
615:24;616:15;
629:6;666:13;
667:24;669:18;
672:25;673:2;699:2,
22;700:17
islands (1)
523:10
isolating (1)
641:8
isolation (1)
605:9
issue (48)
447:5,17;457:24,
25;463:13;464:25;
483:2;492:11;
518:20;520:22;
521:3;551:2,9,11;
552:13,14,16;553:6,
11;556:22;559:5;
560:3;561:15;
565:18;571:22;
572:4;586:19;
587:13;588:10;
606:14;623:12;
630:21;631:21;
632:10;633:16;
636:16;646:25;
652:19;655:2;658:9;
666:8;670:22;
688:12;693:13;
694:21;697:5;
726:18;729:23
issued (4)
475:8;617:24;
618:13,14
issues (33)
482:1;490:22;
494:22;499:19,20;
500:1;506:7;510:14;
514:1;515:24;519:5;
550:16;555:11,25;
556:8;567:8;590:6;
593:21;594:9;
595:21;604:19,20;
608:8;630:25;653:2,
4;654:20;662:16;
684:13,15;704:1,5,9
italics (1)
691:2
item (2)
455:7;589:14
items (3)
481:24;483:11;
560:17

J

Jermano (4)
675:15;677:16,18,
19
Jo (1)
677:17
job (24)
437:14,22;438:9;
443:2;454:2;470:3;
473:4;486:2;508:2;
516:20;517:6;
519:13,17;524:8,20,
20;526:14;528:10;
599:23;654:18;
662:24;683:21;
685:1,18
Joe (1)
483:8
John (61)
433:18;437:2;
455:3;456:1;461:11;
479:2;481:7;482:25;
495:12;501:11;
503:10;505:19;
506:25;508:19;
531:23;532:10,24;
534:3;536:24;541:5;
544:11,19;547:5,14;
548:8,19;550:23;
552:10;556:7;
559:25;561:19;
564:4;574:16;575:7,
12;578:12;580:25;
587:11;588:23;
589:15;592:9;597:6;
601:2;605:4;611:22;
615:18;616:7;
627:15;631:1;632:4;
647:10;648:1;655:6;
656:9;657:16,17;
665:22;672:15;
675:15;677:16,19
John's (2)
612:24;653:17
join (1)
533:8
joints (1)
727:24
joy (1)
519:24
judge (1)
512:5
judgment (2)
618:16;625:18
judgments (2)
574:15;575:22
July (5)
463:20;470:22;
475:13;525:10;538:6
jump (1)
549:21
June (6)
470:21;525:10;
538:5;539:22;
682:11;736:4
junk (1)
466:5
justify (3)
692:6;695:23;
697:25

K

keep (21)
451:4;462:19;
463:5,9;484:14;
487:1;508:2;528:10;
546:3;554:10;573:4;
578:2;579:25;
581:24;586:18;
651:4;656:23;
657:18;675:17;
685:7;737:9
keeping (2)
516:21;573:14
kept (5)
464:4;468:19;
469:5;573:6;735:12
Kevin (4)
625:3;696:21;
701:11,14
key (9)
434:19;531:25;
532:6;535:4;550:25;
579:16;614:18;
684:8;691:1
kg (4)
691:15,17,25;
692:1
kicks (1)
568:21
killed (1)
465:1
kilograms (9)
622:17,20;624:11,
14;626:6,9;628:24;
637:9;690:14
kind (18)
432:3;439:1;
459:15;479:16;
481:19;491:21;
494:7;502:18;514:2;
591:5;606:24;632:9;
664:15;700:6,18;
713:13;723:18;
734:10
kinds (3)
601:7;621:24;
728:3
King (7)
473:25;481:4,7;
492:4;493:20;
494:10;535:19
knew (3)
439:2;512:7;605:4
Knocking (1)
449:11
Knoll's (1)
686:9
knowing (2)
470:10;663:2
knowledge (2)
527:2;565:17
known (1)
568:14
knowns (1)
568:14
known's (1)
568:16
knows (1)
501:3
KRUPPENBACHER (13)
542:7;587:5;
593:4,13;594:13;
595:14,19;596:6,19;
645:6;646:1;713:3,4
Kryzak (5)
680:22;686:1,2,3,
22

L

lab (2)
468:17;686:9
laid (3)
495:4;609:5;
714:19

Lake (1)
458:7
Lakes (1)
678:18
land (1)
528:8
landfill (4)
437:25;523:25;
529:6;537:4
landlocked (3)
442:20;661:13,15
landslide (1)
529:8
lane (5)
609:9;610:14;
729:8,11,17
lanes (3)
613:3;728:10,15
large (16)
444:20,25;446:15;
454:8;462:16,19;
471:4,5;504:18;
543:24;558:21;
559:12;588:12;
651:3;652:10;729:19
largely (1)
646:23
larger (5)
445:15;450:25;
597:2;645:15;660:12
largest (2)
446:23;607:14
last (37)
442:11;443:20;
453:18,19;472:20;
480:8;495:9;521:14;
526:13;560:21;
564:8,16;583:2;
605:12;608:14;
625:21;626:10;
628:17;631:5,8;
637:10;639:12;
642:16;646:6;660:7;
670:15;686:9;
688:17;691:2;
698:18;709:15;
714:6;719:24;
736:25;737:4,8,16
lasted (1)
476:15
Lastly (1)
577:20
late (8)
584:5,20;585:1;
635:8;660:13;
662:20;674:23;737:1
later (11)
434:5;438:3;
520:6;521:13;
551:14;604:5;
605:19,22;641:9;
651:21;711:5
lateral (1)
668:13
Laughing (1)
509:4
laws (1)
484:2
layer (8)
459:15;468:15;
475:4,15;557:11;
641:8,10;645:11
layers (3)
718:20,23;729:23
layouts (1)
610:14
lead (1)
433:19
leads (3)
543:7;698:21;
708:25
learn (10)
440:10;491:5;
502:14;512:15;
568:9;592:1,14;
601:20;603:3;604:25
learned (19)
439:18;498:12;
499:9;511:21;
543:12;564:19;
566:14;572:20;
575:6,22;591:20;
592:4;594:22;600:2;
657:22;658:8;
702:16;705:15;707:4
learning (1)
605:10
least (21)
442:6;453:6;
467:22;476:9;
480:20;519:16;
520:24;564:18;
618:11;620:19;
635:22;639:11;
658:6;666:15;672:2;
685:2,3,22;688:23;
695:15;726:12
leave (4)
550:13;562:6;
582:8;675:5
leaves (1)
606:23
leaving (1)
644:2
led (1)
525:1
left (16)
437:9;441:17;
445:10;450:17;
470:4;475:3;476:7;
479:3;525:13;
576:11;653:11;
669:25;670:15;
676:13;681:7;682:18
legislative (1)
709:25
length (4)
476:16;514:16;
637:10;729:4
lengths (1)
578:11
lengthy (1)
689:15
less (28)
442:21;443:11;
446:12;475:2;
528:23;536:9,18,21;
556:17;580:2;
594:11;595:4;
597:13,19,21;
608:23;618:7;
655:15;659:8,19;
676:11,16,20,22;
690:12;714:20;
715:4;726:13
lessen (1)
593:11
lessons (3)
702:16;705:15;
707:4
letter (1)
677:21
letting (1)
675:18
level (19)
450:3;466:12;
476:6;502:13;
533:11;541:18;
550:11;573:4;581:4;
621:17;654:11;
657:6;658:10;
661:15;701:3,5;
711:16;715:14;730:4
levels (24)
552:20;576:13,13;
582:1;593:22;
617:18;631:1;
636:12,18;643:19;
666:14;668:23,24;
673:16;676:12;
692:22;694:4;697:5,
10;699:1,23;700:16,
20;711:18
Life (8)
534:19;556:25;
622:21;628:25;
671:20;678:23;
687:24;707:25
lift (4)
511:20;644:10;
645:9,12
lifted (1)
465:21
lifting (1)
736:1
lifts (2)
496:3;645:3
light (2)
531:18,18
Lightening (1)
453:4
lightly (1)
530:6
lights (1)
723:24
likely (2)
439:25;652:15
limit (6)
483:5;527:12;
572:6;582:2;610:25;
660:15
limitation (1)
518:14
limitations (3)
521:7;534:17;
595:1
limited (7)
436:2;447:11;
549:12;553:21;
651:2;672:5;730:19
limits (3)
436:18;536:13;
573:2
line (34)
437:11;441:2;
458:12,12,14,16;
468:5,6;469:1,2,20;
472:20,23;473:2;
474:21;477:8,11;
480:1,19;491:2;
496:8;499:22;
507:15,16;511:24,
25;537:20;556:5;
596:18;649:16;
716:20;721:3,4;
726:23
linear (1)
572:17
lines (15)
447:15;473:19,23;
474:13;476:5;
477:24;478:4;503:8;
538:12,15;539:16;
561:21;609:7;
610:19;731:24
link (1)
677:25
list (2)
453:23;465:3
listed (1)
457:23
listen (1)
435:3
liter (3)
454:4;561:20;
636:13
little (20)
442:5;454:18;
468:24;480:11;
497:19;537:8;
539:10;555:14;
558:24;568:9;
573:11;575:25;
654:6;666:6;682:15;
683:1,23;693:21;
709:12;721:25
load (54)
448:15;477:11;
520:12;536:2;
571:16,19;574:7,12;
575:7,9,18;578:2,4,5,
7;579:3,9,10,22;
580:6;623:14;624:4;
625:4;626:22;
628:21,23;629:5,8,
24;630:1,24;632:25;
655:18;670:22;
672:17;682:16;
683:9,15,16;685:4;
689:19,22;690:2,6,8,
16,22;692:4,6;693:8;
695:21,23;708:22;
712:21
loaded (4)
450:10;452:22;
455:9;472:11
loading (2)
448:19;458:24
loads (8)
624:1,2,9;626:2,
14;631:4,6,15
local (2)
700:16;710:9
located (1)
688:6
location (10)
462:21;510:25;
572:19;600:10;
644:22;721:25;
727:25;728:1;729:1;
732:8
locations (6)
631:24;660:14;
714:11,14;721:23;
724:12
Lock (5)
440:21;471:16;
517:4;518:25;520:8
locks (2)
444:23;517:1
log (1)
467:6
logic (3)
642:7,11;644:1
logistical (1)
577:18
logs (3)
650:8,9,9
long (16)
432:18;433:3,14;
438:5;445:1,6;
467:11,12,18;
493:13;505:4;513:7;
535:3;584:8;633:14;
681:15

longer (7)
467:14;468:19;
469:5;535:24;546:3;
556:17;670:8
longest (1)
678:12
long-term (3)
624:18;634:1;
671:20
look (78)
461:3;481:17,20,
23;482:18;484:21;
486:21;492:4;
494:15;498:14,24;
499:15;508:9;
516:13;537:8;539:4;
543:11;544:4;546:6;
551:7,16;554:4;
558:20;560:8,12,14;
563:14;565:12;
567:1;571:14;572:5;
576:24;578:5,21;
590:15;591:22;
592:11;603:11;
604:23;605:8;
609:17;610:21;
612:20;618:2;
619:20;623:20,25;
636:17,20;649:11;
650:11;653:15;
654:5,7,8;659:4,16,
25;662:23;666:12;
673:14;698:6;
699:18,21;700:4,9,9;
701:8;703:5;709:9;
713:6;714:17;
715:12;716:9;718:9;
719:17;722:6;735:12
looked (22)
474:23;481:16;
493:21;499:1;
571:15;576:3;593:8;
595:16;623:7,13;
624:1,8;647:25;
648:5,19;652:8;
673:4;697:24;
698:12,23;715:7,25
looking (33)
455:13;458:8;
481:16;499:13;
516:4;522:18;
537:11;546:8;
574:24;588:13;
593:14;594:16;
606:19;610:14;
612:1;643:8;645:12;
647:11,18;650:25,
25;654:10;657:4;
661:21;662:11;
668:25;673:4;
699:12;701:2;
703:23;712:24;
715:6;730:15
looks (8)
561:10;603:15;
632:8;633:2;636:18;
661:16;698:7;722:20
loose (1)
458:7
lose (1)
593:25
loss (7)
455:7;571:4;
584:5;605:7;632:13;
691:5;693:3
losses (4)
632:12;668:17;
669:9;670:25
lost (22)
453:3,23;454:1,14;
457:7,19,24,24;
459:16,18,24;460:7;
463:18,24;468:16;
517:7;549:22;570:8,
16;611:10;635:22;
672:16
lot (75)
458:23;462:1;
475:6;481:13,23;
482:7,10,19;483:20,
21;488:1;494:1,20;
504:14,17;511:22;
513:10;522:10;
525:10;529:21;
531:21;532:10,11;
534:3;564:20;
565:22;566:1,2,3,3,4,
8;571:14,24,24;
575:22;577:17;
578:15;591:20;
592:5;600:19;604:2;
612:4;621:6;630:22,
23;634:6;637:6,12;
639:3;640:16;
644:17;647:17;
652:24,25;653:8;
656:5;657:22,23,24;
659:7,9,23;669:4,23;
670:19,20;672:17;
684:17;698:4;701:3;
730:6;734:6,16;
735:25
lots (2)
491:14,15
love (1)
666:11
low (14)
500:15;501:22;
513:6;533:17;
541:10;581:5,9;
605:14;623:9;
625:15;649:11;
650:17;661:24;662:1
lower (29)
480:19;519:3;
557:15;578:12;
589:17;604:13,16;
624:1,3,9,12,14,19;
625:2,3;626:23;
631:2,9;634:19;
667:1;682:20;
683:10,13;690:3,22;
692:2,4;695:19,21
luck (3)
484:5;514:4;
568:21
lunch (8)
433:9;434:3,7,11;
456:10;457:14;
615:15;673:23
luncheon (1)
674:5

M

machine (5)
450:8;451:7;
462:6;467:20;529:8
machinery (1)
577:16
machines (2)
444:15;667:21
MAGAR (32)
515:23;518:2,10;
520:17;521:8,17;
522:13;525:16;
597:8,25;598:22;
600:23;601:16;
602:14;603:5;
605:11;622:3,7;
623:17;624:20,24;
625:17;626:19;
627:22;638:16,22;
640:10;642:10,18;
643:14;645:1;667:4
main (6)
437:9,14;492:11;
605:9;710:8;727:4
mainly (1)
663:7
maintain (4)
557:22;605:15;
679:12;711:20
maintained (4)
516:11;609:1;
641:2,4
maintaining (2)
446:24;466:21
maintains (1)
690:7
maintenance (4)
544:24;641:7;
679:12,19
major (6)
468:3;506:12;
689:16;693:4;
694:16;710:4
majority (3)
444:7;637:17;
730:15
makes (3)
631:17;673:1;
704:21
making (13)
435:1;436:21;
481:10;488:22;
496:4;534:14;565:1,
3;576:7;607:11;
619:10;640:2;710:24
man (3)
559:4,5;584:3
manage (3)
517:19;581:2;
735:4
managed (1)
522:15
management (5)
514:23;520:13,14;
521:23;687:4
Manager (2)
432:25;619:7
mand (1)
640:3
maneuvering (1)
454:8
Manna (1)
677:17
manner (2)
688:22;695:17
manufacturer (1)
449:4
manufacturer's (1)
449:2
many (21)
432:16;434:8;
446:2;447:2,13;
453:11,12,13;458:2;
465:18;486:9;
552:23;565:11;
572:10;602:21;
606:21;607:16;
643:20;652:4;
694:23;722:13
map (9)
469:3;473:24,24,
25;474:2,10;478:2;
479:10;500:22
mapped (2)
441:3;728:19
mapping (2)
468:16;713:8
maps (3)
507:25;612:25;
713:2
Marine (1)
697:1
Marketing (2)
709:17,25
marvel (1)
710:20
mas (1)
581:3
mass (27)
537:22;538:11;
540:5;550:21,24;
554:25;570:4;578:9;
580:21;603:2;
605:23,24;618:7,9;
630:15;639:2,4;
676:5;689:19;
690:15,15,21;
691:14,20,23;
695:12;708:22
masses (1)
669:14
match (1)
491:21
matching (1)
720:23
material (66)
437:18;438:3;
444:19;446:18;
448:2,7,23;450:17,
25;451:6;453:13;
463:2;467:21,24;
469:18;471:24;
497:6;502:10;503:2,
3,4;504:18;511:9;
521:19;537:6;
559:16;561:2,3;
581:15;588:21;
591:17;596:16;
598:17;604:10;
619:2,4,16;637:5,25;
638:8;639:6;640:12;
641:13;644:11,17;
645:19,22;651:16;
652:16,18,23,25;
653:1,5,18;655:8;
661:22;662:18;
668:1,23;669:13;
670:3,5;690:9;
726:13;730:21
materials (8)
524:19;526:23;
528:7;539:19;
590:22;611:9;
639:23;641:15
materials-handling (1)
521:3
matter (11)
449:21;497:19,21,
23;498:3;511:22;
522:3;593:17;
643:16;664:5,22
max (5)
451:6,15;463:19;
561:24;712:20
max'd (1)
550:20
maximize (1)
705:19
maximum (8)
441:8;463:23;
464:19;526:6;

528:17;540:10,10;
580:16
may (45)
440:4;452:9;
463:7;483:12;
484:22;490:23;
496:6;501:11,11;
503:11,12,19;508:3,
4;527:16;529:2;
538:25;541:3,13;
542:5,6;544:16;
545:15;563:11;
564:17;592:9;
608:15;612:13,19;
613:16;630:5;650:4;
666:16,19;668:13;
670:24;672:5,7;
677:24;680:18;
682:19;735:19,21,
24;737:19
Maybe (38)
474:21;488:24;
490:11;491:6;
503:20;504:15,16;
507:22;508:6;
513:11;514:8;
517:20;518:7;
521:24;523:3;
563:12,12;582:24;
595:4;598:25;599:5;
603:14;612:8,21;
613:13,13,15,21,22;
614:3,4;639:16;
659:18;664:2,14;
667:1;669:17;712:13
meager (2)
692:17;693:9
mean (18)
461:15;463:7;
494:14;509:17;
512:1;520:20;538:3;
586:1;598:11;
600:24;602:23;
606:19;627:9,23;
665:5;667:19;
669:22;731:16
means (5)
535:15;622:21;
623:15;655:13;
671:19
meant (1)
715:4
measure (2)
524:10;537:21
measurement (1)
718:18
measurements (1)
445:19
measures (1)
672:8
measuring (1)
668:24
mechanical (1)
683:18
mechanism (1)
655:6
mechanisms (1)
666:22
median (2)
672:20;701:2
mediating (1)
433:13
Mediation (2)
688:19;701:18
Mediator (1)
433:12
meet (34)
447:14;464:24;
479:19;486:4,23;
487:6,13,20;488:21;
489:6,25;490:3,15;
495:16;498:16,18;
528:16;532:7;
546:15;567:24;
568:3;583:21;648:9;
659:21;688:21;
702:19;704:7,10,19,
25;705:11,12;732:1;
733:22
meeting (9)
474:11;534:10;
604:4;677:14;689:9;
705:4;735:24;
736:13,15
meetings (4)
723:4;735:18;
736:12;738:13
Melinda (4)
432:23;437:1,2;
738:12
member-at-large (1)
689:2
members (5)
435:11;693:18;
713:18;737:21;738:6
mention (3)
457:22;634:20;
717:18
mentioned (19)
501:12;503:10;
508:20;512:12;
526:14;547:6;
549:20;571:2;
574:18;578:13;
581:19;607:7;
634:24;655:7;656:2;
665:22;672:1,15;
734:22
mess (1)
591:2
met (5)
474:13;489:14;
496:4;567:25;705:8
metal (1)
658:9
metals (1)
658:8
method (1)
505:16
metric (7)
538:11;607:20;
622:18;652:7;
653:21,22,24
metrics (1)
656:13
mg/kg (1)
692:14
mic (2)
455:3;456:2
microphone (3)
432:13;575:13;
637:2
microphones (1)
529:11
mics (1)
432:9
middle (6)
466:14;539:1;
611:25;700:11;
731:24;735:22
mid-September (1)
478:1
might (28)
439:13;460:22,22;
465:19;470:9;
496:11;502:8;
527:22;553:10;
583:22;592:25;
593:2;598:6;602:16;
603:21;612:13;
613:10;622:12;
626:14;630:16;
636:2;640:13;650:6;
663:15,16;684:8;
719:16;733:25
mile (5)
627:17,19;633:3,
13;638:2
miles (10)
572:13;627:13;
632:11,16;633:7,18;
634:17;669:20;
700:20;710:15
Miller (2)
699:3;700:5
million (13)
437:17;438:17;
439:15,17,24;440:6,
17;441:12,18,21;
584:3;632:9;647:16
millions (2)
528:1,1
mind (2)
628:16;687:17
mined (1)
605:5
mini (5)
552:21;587:25;
588:1;592:24;595:6
mini-hopper (10)
444:20;445:3,4,8,
15;446:7,20;559:4;
586:11;592:19
mini-hoppers (3)
445:9;558:25;
593:3
minimal (4)
467:16;475:4;
636:20,23
minimize (4)
480:5;585:7;
682:17;727:7
minimizes (2)
576:14;585:5
minimizing (4)
495:13;681:5,6;
684:2
minimum (4)
438:24;654:12,14;
732:1
mini's (13)
587:9,10,14,15,20,
24,24;588:6;591:8;
593:11,12,15,15
mini-scow (1)
465:9
mini-scows (13)
447:10;454:9;
462:10,11,14,23;
463:3;466:10;
467:10,19;468:2;
548:19;552:17
minus (7)
468:22;472:23;
474:3;475:16;499:3;
507:18;599:21
minute (14)
448:16;449:3,4,6;
474:17;489:20;
529:13;530:18;
614:1,13;617:5;
674:18;684:21;
694:10
minutes (18)
449:10;517:13;
525:13;528:20;
606:1;614:16;646:5;
669:25;670:15;
674:21;675:8,16;
696:22;712:8,20;
717:25,25;737:13
missed (1)
652:19
mission (1)
709:23
mitigate (1)
559:10
mitigation (2)
557:7,9
mitigations (1)
557:7
mix (2)
631:18;660:5
mixing (5)
639:19,22;642:18;
668:11,13
mixture (1)
668:4
MNA (1)
630:21
mode (2)
657:13;714:22
model (19)
580:3,11;622:25;
623:1,9,13,24;
624:17;625:2,3;
626:3;632:24;633:2;
698:8,12,14,17;
727:9,11
modeling (4)
691:10;692:5;
695:22;698:20
modelling (4)
516:25;611:7;
629:17;698:24
models (3)
580:4;623:5;
634:10
modest (1)
541:14
modification (1)
563:22
modifications (1)
574:20
modified (2)
560:11;705:21
modify (1)
575:19
modifying (1)
663:11
Mohawk (1)
686:13
monitor (4)
567:16;616:11;
667:23;670:5
monitoring (13)
533:22;534:12;
640:19;658:7,13;
666:20;669:21;
693:15,24;697:17,
23;700:23;708:25
month (24)
443:11,14,17;
444:2;463:14,21;
475:25;485:10,15;
486:19;490:4;504:4;
516:18;525:9;
528:15;537:15,17,
19,23;543:21;544:5;
553:19;563:13;
613:17
monthly (8)
441:9;443:9;
464:19;486:10;
535:8;537:11,13;

543:19
months (5)
444:1;486:9,12;
529:7;544:16
months' (1)
486:16
monumental (2)
652:2;678:16
Moon (1)
695:5
more (131)
433:14;442:22;
448:23;451:11,14;
464:21;465:23;
466:16;468:2,8;
469:25;470:2;
479:11;486:18;
491:5;495:3;499:7,
19;500:7;507:10;
510:7;514:22;516:6;
518:2,13;519:4,14;
520:18,19;521:22;
530:10,12;532:17;
533:19;535:16;
536:15,16,17,17;
539:4;545:2;546:8,
11;553:9,11,14;
554:22;555:6,7;
556:15,18;559:22;
561:9;567:12;569:6,
10;570:24;572:14,
25;575:25;576:8;
577:23;578:20,25;
583:1,17;584:25;
589:21;591:25;
592:10,15;593:2,10;
597:10;598:13,14;
601:4,11,21;603:18;
608:1,23;612:4,14;
613:12;625:20;
626:9;627:24;
628:13;630:22,24;
632:14;634:6;636:3;
647:17;650:2;
652:15,25;655:23;
659:11;661:22;
665:7;666:24;669:3,
7;672:22;676:8,9,19,
22;677:14;680:13,
24;683:22,25;
684:19;686:19;
690:9,24;692:3;
693:21;694:18,20;
695:20;696:16;
700:20;710:23;
712:8;725:11;727:2;
729:25
morning (10)
436:25;474:11;
530:3,5;555:10;
594:3;674:14;
693:23;705:6;712:16
most (31)
438:8;443:19,23;
450:12;451:25;
466:23;472:4;477:5;
507:13;510:3;
523:23;527:8;567:4;
571:17;599:7;
616:24;621:10;
626:2;647:21;
649:10;650:23;
672:20;673:10;
679:4;685:1,21,21;
687:19;718:16;
726:24;730:25
mostly (1)
474:6
mound (1)
466:14
mounted (1)
448:4
move (26)
446:2;452:18;
455:2;466:19;
467:22;525:14;
553:2;557:8;563:4;
572:18;578:16;
579:2;583:5;589:2;
600:17;604:13;
608:1;645:24;
673:23;682:19,20;
713:21;720:16;
727:22;729:10,12
moved (6)
437:18;453:14;
506:11;562:1;609:7;
728:11
movement (1)
589:12
moving (26)
440:4;454:8;
455:17;457:11,13;
475:22;480:13;
516:4,16,25;521:12;
524:19;529:21;
538:8,9;541:20;
557:13;561:4;570:9;
584:19;590:19;
609:9;639:3;668:21,
21;669:14
much (60)
434:8;436:6;
445:20;468:8;
475:18;496:15;
499:11;504:14;
517:1;520:3;530:9;
570:2,3;572:14;
573:16;575:18;
578:7;580:19;590:1;
592:15,24;593:25;
601:20;606:22;
607:8,9;608:9;
611:13,14;612:7;
613:15;626:2,2;
630:3;635:15;
639:22;653:15;
654:11;664:9;669:7,
19;673:5;676:8,9;
680:21;682:24;
683:6,7;686:24;
696:13,16;697:21;
709:12;712:4,6;
725:8,11;732:15,23;
737:15
mud (12)
437:12;450:22;
466:5;514:25;519:7;
520:8;523:18;553:9,
14;716:19;721:2,4
Mulligan (48)
433:19;436:25;
437:3;454:22;455:5,
19,23;456:4,8,13;
457:3,18;461:12,18;
463:12;468:10;
479:4;485:20;
487:21;488:6,16;
489:16;492:1;
495:21;497:14,23;
505:21;507:9;509:4;
510:16,19;512:21;
516:9;518:21;
520:21;521:15;
522:10,20;526:1;
527:1,16;528:18,24;
530:1;536:24;556:7;
587:11;592:9
Mulligan's (1)
597:6
multi-elevations (1)
721:19
multi-part (1)
646:8
multiple (5)
644:9;645:10,17,
23;646:2
multi-year (1)
680:12
municipalities (1)
695:5
Murphy (1)
484:2
muscle (1)
686:11
muscles (1)
686:11
museums (1)
710:9
must (6)
436:6,9;480:2;
692:19;711:14,20
myself (1)
564:18
mysterious (1)
609:25

N

name (12)
432:23;437:2;
552:9;675:19;
677:19;686:2;687:2;
696:24;701:13;
709:15;713:3;733:2
nanograms (4)
454:4;561:20;
615:21;636:12
narrow (1)
589:11
National (2)
566:24;675:20
nation's (1)
710:22
native (2)
458:5;470:5
natural (3)
580:2;618:5;694:5
nature (4)
481:19;484:8,15;
506:2
navigation (10)
440:21;471:8;
553:4;595:3;607:1;
678:13;680:4,10;
696:6;731:25
navigational (7)
478:16;507:10,13;
679:10;680:7;
711:24;712:1
near (4)
597:4;631:2,13;
659:2
nearby (1)
715:17
near-field (3)
658:2;693:14,23
nearly (2)
542:14;639:22
neat (2)
466:11;467:25
necessarily (10)
491:21;577:22;
594:3;659:6;661:6;
666:4,25;673:12;
706:15;715:3
necessary (2)
704:18;707:15
need (100)
432:21;434:6;
435:9;450:14;456:1;
464:19;468:12;
480:23;482:19,20,
22;483:9;484:13;
487:6;490:12;
491:17;494:13,14;
495:3;498:13;501:5,
16;502:11,12,20;
504:2,16;507:14;
512:15;523:2;535:7;
551:5,8;553:12;
560:16,17;561:16;
562:13;563:4,14,20;
564:24;565:6;
570:10,11;573:18;
574:23;575:15,16;
576:2,20;577:20;
579:8,10,13;580:4,
18;592:24;601:20;
602:20;609:18;
610:2;614:1;619:18;
626:13;627:6;
631:16;634:3;
640:25;644:12;
649:24;652:7;654:7,
24,25;656:22;
657:21;659:2,7,23;
662:5,23;663:21;
665:19;667:15;
672:3;673:23,25;
674:11;679:21;
683:22;696:2;706:2,
9;713:20,21;717:19;
721:16;733:18,25
needed (10)
511:21;564:23;
592:10;600:17;
625:10;640:5;642:6;
661:6;662:18;684:15
needs (10)
489:14;510:13;
579:23,25;580:3;
582:6;655:9,11;
696:8,9
negative (2)
499:8;702:22
network (1)
678:6
network's (1)
678:14
Nevertheless (1)
469:17
new (32)
434:16;435:11;
437:11,14;439:12;
477:7,8,10;480:1;
504:22;534:20;
586:7;627:7;675:25;
677:20;678:1,2,4,11,
19;679:14,14,23;
680:6,17;686:7;
697:2;701:15;
709:22;710:14,24;
711:10
news (1)
709:14
next (41)
434:14;439:5;
441:22;466:2;
468:18;479:16;
494:5;499:23;
502:23;504:6;
508:13,17;512:19;
518:9;530:22;
534:15;542:25;

583:6;592:25;
602:17,18,20;613:2,
17,20;614:7;627:1;
628:5;646:16,19;
674:9;675:14,16;
677:16;680:8,21;
685:25;696:20;
701:11;712:2;735:1
nibble (1)
602:8
nibbling (1)
600:20
nice (2)
513:16;659:22
night (1)
568:24
nine-inch (1)
543:16
nineties (3)
635:8,9;701:22
Niskayuna (1)
686:9
nitty-gritty (1)
653:3
NOAA (1)
675:25
nodding (1)
602:14
nodules (1)
667:8
noise (1)
436:20
nomenclature (1)
653:2
non-complete (3)
654:19,21;655:1
non-data (1)
643:24
non-detect (2)
653:8;701:3
Non-Dredge (2)
692:7,9
None (1)
490:1
nonetheless (1)
728:2
non-native (1)
651:16
non-target (2)
643:5,11
nooks (1)
509:14
norm (1)
631:6
normal (1)
635:4
Normally (2)
511:5;525:9
north (3)
589:4;672:11;
725:21
northern (1)
555:21
Northumberland-Fort (2)
699:3;700:5
note (4)
440:3;515:15;
536:23;693:18
noted (2)
676:7;689:10
not-for-profit (2)
709:19;711:17
noticed (1)
616:7
notified (2)
469:1;473:21
notify (1)
619:6
November (2)
453:20;584:16
NPA (1)
653:25
nugget (1)
511:24
number (36)
441:5,21;446:21;
457:9;461:5;463:15;
472:14;482:12;
486:13,20;489:19;
491:3,10,23,24;
492:7;516:5;521:2;
534:2;535:15;536:9;
541:1;544:20;
545:19;553:19;
559:18;560:21;
579:20,23;582:3;
588:4,5;595:6;
607:20,24;704:21
numberer (2)
440:2,11
numbers (13)
442:15;443:1,17;
453:8;461:3;536:4;
580:12;587:8;588:4;
625:14,15,21;697:13
numerous (2)
680:3;711:23
nuts (1)
610:7

O

object (1)
492:1
objection (3)
675:7;681:14;
682:4
objective (2)
493:4;667:20
objectives (2)
702:21;706:17
obligation (1)
522:22
oblivion (1)
679:9
observation (2)
665:17;730:17
observations (2)
481:12;689:8
observe (1)
626:21
observed (5)
532:6;549:5;
703:8,10,18
observers (1)
738:5
observing (1)
540:7
obstacles (1)
694:16
obtain (1)
634:13
obtained (1)
634:12
obvious (3)
521:18;694:8,11
obviously (27)
499:10;504:7;
547:12;559:12;
573:22;577:23;
582:12;592:2,13;
597:23;607:2;
616:23;617:22;
621:21;630:19,21;
645:9;659:13;
661:23;664:5;
665:14;666:9;
673:18;688:13;
692:21;725:4;729:19
occasion (1)
546:18
occasions (1)
534:2
occur (7)
514:3;564:24;
565:7;576:9;611:20;
684:7;707:11
occurred (5)
453:16;463:19;
573:16;584:15;
668:10
occurring (3)
692:18;694:22;
703:12
occurs (2)
578:19;582:3
Ocean (1)
678:19
Oceanic (1)
675:20
o'clock (3)
474:12;505:8;
674:2
October (7)
539:1;544:16;
545:16;620:14,21,
23;660:14
odd (1)
669:5
off (37)
433:17,19,24;
436:20;443:23;
450:20;456:9;
457:14;458:24;
463:17;465:17,21;
472:15,18;474:5;
475:23;477:14;
481:2;496:3;523:17;
529:5;537:1;540:2;
557:12,15;584:6;
608:24;613:15;
628:10;630:21,22;
714:2;716:11;717:2,
3;720:12;735:22
offer (1)
688:20
Office (1)
474:1
official (1)
617:20
off-load (3)
450:19;553:8;
561:8
off-loader (3)
559:23;560:9;
595:8
off-loading (1)
552:15
offset (3)
595:7;714:12;
721:24
offsite (1)
537:6
often (1)
507:23
Oh-oh (1)
432:10
oil (9)
659:13;664:4,19;
666:16,17;667:7;
668:8;670:25;693:2
oil/sheen (1)
706:5
old (2)
437:7;469:19
older (1)
635:7
once (15)
467:14,22;471:17;
476:20;484:19;
503:8;504:24;
577:24;590:18;
641:18;644:15;
699:15;714:24;
721:8;736:17
one (188)
432:14;435:13;
439:7;442:22;
444:11,18;445:7;
446:4,6,14,23;
448:16,24;451:21;
462:8,18,19;467:24;
468:14;479:11;
485:10;487:8;
490:17;491:17;
493:14,25;494:18;
498:13;500:7;503:1;
506:7;507:6;508:20;
511:17,23,25;
512:12;513:1,9;
514:5;515:2;516:1;
517:12,15;519:4,19,
20;520:10;524:17,
23;526:24;527:4,6;
529:11;530:13;
533:18;534:21;
542:15;544:5;
546:18;548:11;
550:1;554:13;
558:23;561:6;
565:25;568:23;
569:3;572:4,19;
573:5,19;575:1;
576:3,6;577:10;
580:22;582:24;
585:2,24;587:8,14,
24;590:6,13;591:10,
11;592:20;593:20;
597:9;602:1;603:6,
17;604:1,9,22;605:9;
607:6,21;608:24,24;
611:24;612:22,22,
24;613:7,19,21;
614:1;615:8;618:3;
622:14;624:12;
625:23;627:3;
631:20,21;632:6;
633:20;634:2;637:3;
638:11;644:14;
646:24;647:5,21;
651:13,21;653:15,
16;656:1,6,6,11,11,
15,15;660:6;663:9;
666:14;670:16,21;
672:1,15;674:3,22;
675:3;681:1;684:19;
692:14;694:10;
696:4;698:11;699:4,
11,17;705:8;708:8;
709:24;710:10,12;
712:12;713:15;
714:9,25;717:13,13;
718:13,22,23,24;
721:1,11,11;727:3,5,
25;728:1;729:13;
730:12;731:5,16,23;
733:13,16,17;
737:16,18
one-and-a-half (1)
694:2
one-foot (1)
640:11
one-hour (2)
434:3;436:2
one-month (2)

536:6;537:9
ones (3)
462:16;542:16;
726:22
one-yard (5)
444:13;446:5;
460:15;462:9;464:11
ongoing (1)
726:1
only (43)
438:8;441:13;
443:13;450:7;
460:24;462:4;464:7;
466:24;471:9,13;
476:13;506:3;
508:24;520:2;
521:15;527:11;
541:8;549:20;
553:19;573:7;
581:21;589:19;
603:17;625:13;
631:9;636:16;
645:20;651:6;
663:18;665:11;
676:18;678:3,5,17;
693:8,10;698:1;
702:14;706:19;
714:22,23;733:13;
734:2
on-site (2)
557:24;558:1
onto (4)
506:20;584:7,7;
673:23
onward (1)
678:9
open (12)
465:22;468:19;
469:5;495:25;542:6;
546:3;573:14,17;
612:7;615:2;694:2;
736:15
opened (2)
542:8;710:21
opening (1)
733:5
operate (3)
562:7;572:11,12
operated (2)
465:16;678:10
operating (3)
541:23;572:8;
678:6
operation (24)
447:25;449:9,15;
451:24;463:9;
490:16;496:21;
536:21;542:19;
546:19,22;548:21;
557:20;558:14;
562:10;570:12;
588:3,12,14;589:2;
590:7,17;605:3;
660:12
operational (3)
482:3;509:16;
683:18
operations (14)
453:5;483:4;
484:14;534:8;
541:12;542:4;
587:17;589:10;
604:8;616:18;
704:17;707:13,16,21
operator (3)
449:13;507:2;
619:9
operators (1)
597:1
opine (1)
574:25
opinion (3)
640:5;642:14;
695:13
opportunities (4)
602:6,7;657:24;
710:2
opportunity (12)
434:12;435:19;
436:1;485:4;545:23;
582:10,19;598:23;
623:19;674:3;
702:13;717:19
opposed (2)
637:15;677:5
optimal (1)
535:1
optimistic (2)
563:8;708:18
optimization (1)
659:19
option (1)
660:21
options (1)
650:5
oral (1)
435:19
orange (2)
513:1;612:24
Orchestration (1)
577:17
order (10)
436:4;495:16;
498:19;545:18;
589:2;609:19;
623:14;645:18;
674:16;705:11
ordered (1)
473:23
organization (3)
675:22;709:19,24
original (11)
475:9;486:10;
491:10,11;535:10;
539:25;545:17;
641:19;667:16;
679:6;716:19
originally (4)
444:3;536:15;
678:7;690:24
orphan (1)
608:5
OSI (1)
473:23
Oswego (1)
710:17
others (9)
451:12;465:1;
515:20;516:2;
560:23;571:1;
644:20;685:9;710:13
otherwise (1)
576:9
ourselves (1)
572:6
out (171)
434:6,18;435:23;
437:8,22;438:4;
442:5;443:22;
444:15;448:2;450:8,
11,13,25;455:20;
458:6,8;459:23;
460:18,24;461:24;
463:2;465:7;466:4;
469:9,22,25;470:1,4,
4,23;471:2,24;472:2,
6;473:8,23;474:18;
475:10;476:21;
477:2,10,12;478:1,7,
9,11,14,16,18,18;
479:21;480:19,25;
482:13,23;483:1,9,
14;490:22,23;491:4;
492:20,25;497:6;
499:25;500:5;
502:10;504:5,18;
507:21;509:13;
511:9,18,19;513:2,8,
17;517:10,13;519:6;
520:10;522:8;530:3,
14;531:11;532:14;
533:12,25;534:3,9;
536:14,17;545:17;
547:18;556:5,21;
558:17,19;561:8;
562:12;564:21;
567:3,10;570:10;
571:25;575:5,17;
577:7;580:8,21;
588:21,23;590:1;
591:17;593:21;
595:15;596:11,20;
597:14;598:17;
599:11,12;600:6,8;
605:22,23;608:13;
609:5,17;613:9,9;
615:15;618:10;
619:7;626:12;627:6;
633:21;635:21;
641:22;646:24;
648:14;649:6,8;
652:18;653:18;
655:13,14;657:12;
659:13;661:22;
662:18;670:6;
673:11;674:13;
678:18;683:3,5;
685:2;698:4;701:1;
714:9,19;715:21;
716:8;722:24;
724:16;726:15;
728:19;730:8;734:8
outcome (2)
545:12;685:16
outcrops (1)
509:11
outside (10)
434:25;435:3,15;
436:11;466:17;
558:15;664:18,21;
665:1;737:23
outweighs (1)
702:10
over (68)
433:4;436:24;
439:5,25;442:7;
446:8;448:4;451:1;
466:20;467:11;
468:12;471:12;
472:5;473:10;
475:25;476:9;477:4;
480:13;481:3,11;
488:11;492:2;
497:15;513:4;519:7,
8;523:13;531:20;
532:24;534:10;
537:12,20;547:7;
548:17;557:11;
561:21;562:4;564:4,
15;576:11;577:16;
579:7;583:25;589:8,
16;595:12;602:5;
608:14;626:10;
633:12;637:10;
645:17,18;650:11;
668:2;674:14;
688:10;702:2;
703:17,23;708:4,7;
717:5,10;723:11,16;
730:18;736:25
overall (27)
434:1;439:9;
440:14,17;470:8;
471:11;488:7;
522:19;547:5,15,18,
21;555:15;561:3;
575:20;578:1,3;
582:21;595:10;
603:11;614:12;
623:22;633:1;669:9;
702:7;704:11;705:1
overboard (1)
559:5
overcome (1)
453:17
over-cut (3)
543:16;560:25;
581:13
over-cuts (1)
511:13
over-dredging (5)
495:18;501:25;
502:1,5,7
over-fitting (1)
698:20
overflow (1)
585:6
overly (2)
563:8;708:18
overnight (1)
713:12
overriding (1)
695:11
oversight (3)
591:19;702:3;
704:3
own (1)
440:23

P

pack (2)
609:14,19
page (2)
549:20;691:12
pages (1)
691:3
paid (1)
684:25
panel (48)
433:21,24;434:21,
23;435:7;436:11,14;
531:1;577:22;
582:10,18,21;614:6,
11,24;615:8;625:11;
629:1;646:25;
657:20;663:8,23;
675:9;693:19;
696:14,15;703:5,21;
704:4,14,17;705:3;
706:12;707:23;
713:18;717:22;
728:7;731:4;732:12;
733:11;735:14,17,
24;736:1,12;737:18,
19;738:10
panelists (1)
674:12
panel's (1)
665:7
paper (3)
686:18,21;689:18
papers (1)
434:17
paragraph (1)

691:12
parallel (2)
728:16;729:7
parameters (2)
658:8;662:25
part (52)
438:8;443:24;
478:25;483:7;
487:11;498:9,10;
503:13;504:15,19;
505:5;512:22;521:9,
25;523:1,23;528:13;
531:25;532:21;
538:13;553:1,3;
573:5;592:4;593:8;
594:16;597:15;
599:25;611:4;
612:11;615:20;
621:10;623:25;
626:18;627:15;
642:8;643:2;644:1,
19;653:21;657:8;
666:15,16,19;
696:10;700:8;
710:10,12;714:2;
718:16;721:1;734:6
partial (1)
604:7
participated (1)
701:20
participating (1)
485:2
participation (1)
435:14
particles (2)
637:21;664:19
particular (5)
476:17;555:20;
611:14;621:11;
670:21
particularly (9)
454:5;462:2;
517:9;552:19;582:5;
637:19;706:4;
708:21;713:20
particulates (1)
629:9
parties (1)
689:25
parts (6)
476:9;513:19;
529:22;562:4,7;
632:9
pass (26)
468:18;470:20;
473:11,12,15;476:9,
15,20;479:5,11;
480:6,8;543:9;
554:24;555:3;
589:10;599:25;
613:6,9;621:1;
686:17;692:1;714:7;
724:24;725:6,7
passage (2)
521:25;637:16
passed (2)
497:12;683:4
passes (24)
447:13;468:12,13,
14,21;475:8;476:1;
480:8;482:12,17;
494:18;539:17;
540:3;543:6,10;
554:22;573:13;
598:12;607:11;
640:20;645:10;
655:15,15;730:18
passing (2)
595:4;689:22
past (15)
517:17;531:21;
533:4,6,8;541:25;
563:19;589:3;
632:12;634:7;679:2;
687:9;689:9,19;
734:16
patch (1)
479:12
patent (1)
686:7
patient (1)
638:20
patiently (1)
646:19
pattern (5)
472:15;699:20,20,
25;700:8
Paul (11)
485:7;529:9;
554:15;586:2;
595:24;606:3;
612:17;663:5;712:7;
733:8;734:22
Paul's (1)
495:10
pay (6)
507:15;524:9;
624:6;626:4,7;
684:22
payback (1)
647:14
paying (2)
524:14;709:8
payment (1)
524:10
PBC's (2)
536:18;570:7
PCB (61)
454:2;537:22;
538:11;540:5,12;
543:8;546:16;
550:24;557:13,15;
561:19,22;570:4;
571:4;574:2;575:7;
576:8,15;578:7,9;
581:3;582:1;598:5;
605:2,7;631:24;
634:6;639:4;652:25;
653:24;658:4;664:4;
669:15;676:5,12;
679:21;680:4;
682:24;689:22;
690:8,12,15,24;
691:5,17,20,23;
692:11;693:12,14,
23;694:4;695:25;
697:5;700:19;702:9;
703:8,15;708:22;
711:24;714:4
PCBs (32)
479:15;492:12;
501:8;536:9;572:2;
578:25;579:12;
581:7,18;621:2;
629:9;632:15,18,19;
633:25;637:9;653:9,
10;655:12;681:6;
683:7,11;685:2;
687:14;695:18;
701:18;703:17;
715:13;718:19,22,
24;731:17
PCB's (2)
580:1,2
peak (7)
451:15;529:2;
540:1;541:22;544:9;
604:17;719:1
peaked (1)
603:10
Peer (22)
433:1,2,7;434:15;
435:21;436:11;
682:9;686:6;688:15;
689:9;693:19;695:9;
696:13,14;706:12;
733:4,23;735:16;
736:2,5,12;737:20
penalty (2)
489:23;491:12
people (12)
432:16;487:9,17;
513:24;517:2;
522:17;614:19;
659:10;674:20;
682:22;688:11;696:5
pepper (1)
497:7
per (28)
443:4,8;448:16;
454:4;460:11,16,25;
461:10;464:13;
476:11,12;478:24;
527:5;537:15;
543:21;553:19;
561:20;562:5,8;
563:13;573:5;
597:24;606:22;
622:17,17;632:9;
636:13;735:20
percent (50)
438:22;453:25;
510:21;528:22;
536:8;547:8,16,19;
554:25;555:18;
570:17;578:11;
580:21;581:7;
585:25;586:11,12,
13,13;587:9,10;
588:20;589:20;
591:7;594:6;595:25;
596:2;611:9;625:11,
25;626:25;632:12,
14;650:17;652:15;
654:13,15,15;
668:24;676:17,19;
682:24;683:2;
690:12;691:16,18;
695:25;697:14,15;
698:2
percentage (4)
497:8;555:15;
580:8;669:2
percentages (2)
587:8;595:23
perfect (2)
574:13;734:19
perform (1)
702:14
performance (40)
472:25;475:9;
481:21;483:8;
485:10,13,18;
486:11;487:4,10,12,
16,23;488:4,19;
489:18,24;494:6;
506:19;523:14;
534:13,19;535:1;
548:2;556:24;
576:17;579:17;
641:23;642:14;
657:4;676:3;677:3,6;
683:24;687:20;
705:5,11;707:9,14;
708:1
performed (1)
679:16
Performing (1)
534:18
Perhaps (6)
446:22;482:5;
497:7;498:23;
644:21;670:23
period (29)
434:5,7;438:16;
463:23;468:19;
474:24;477:21;
486:3;488:12;536:6;
543:23;544:5;
548:17;555:24;
606:23;607:16;
635:11;657:3;
662:14;672:21;
674:10;694:3;
699:15;703:23;
724:13;734:7;735:3,
5;736:11
periodic (1)
679:11
permanent (1)
676:16
permit (1)
689:14
perplex (1)
639:9
person (2)
674:22,22
personal (1)
517:6
personally (3)
490:1;564:18;
693:21
perspective (8)
488:24;493:12;
494:11;536:20;
545:10;546:9;
658:20;734:3
pertains (1)
616:13
pessimistic (1)
525:3
Phase (188)
438:12;439:6,7,8,
18;440:6,9,18;
441:11,16,20;
442:13;443:12,14,
19;446:22;451:9,16;
453:22;459:12,13;
461:8;464:20;
469:16;479:19;
482:2;483:6,16,18,
20;485:23;486:5,7;
488:10;490:5,13;
491:5;492:17;
493:11;495:17,23;
498:12;499:9;
502:14;510:13,15;
512:16;514:21;
515:7,14;521:6,7,14;
525:1;526:3;527:10,
21;528:12;531:17,
22;532:4,9;535:9,12;
538:13,21;539:3;
543:13,13,19,21,25;
544:3,8,9,10,11,14;
545:3,13;546:2,5;
547:25;552:16;
553:22;555:17;
557:4;559:9;560:2;
561:22,25;562:1;
563:5,5;564:20;
566:18;567:18,25;
568:4;569:9,24;
570:19,21;572:3,9,
10,14;573:22,22,24;

574:3,11,11;575:6,11,22;577:3,4;578:10;581:1;584:2,17,18;585:23;591:15;592:5,25;594:11,24;595:13;599:14;603:4;606:1;608:4;631:24;633:6,22;634:12;648:25;649:1;650:10;651:4;652:21;657:23;658:18;662:22;664:13;666:21;671:14;672:4;673:12,14;676:17;680:8;681:25;682:1,6,14;689:23;690:6,10,12;693:25;694:12,15;702:1,2,12,16;703:1,4,7,13,24;705:14,16,22,22;706:4,9,10,15;707:4,17;708:8,9;712:2;734:24
Phases (5) 438:19;439:14;440:1;705:25;707:10
phasing (1) 542:18
phenomenal (1) 647:3
phones (1) 436:21
Phrase (1) 543:14
pick (3) 448:12;465:25;508:9
picked (2) 434:17;674:12
picking (2) 497:6;599:11
picture (11) 446:4,14;447:18;466:3,9,15;547:9;681:22;697:22;715:24;726:16
pie (2) 585:21,22
piece (4) 471:23;516:15;659:17;666:20
pieces (5) 570:13;605:18,20;631:16;636:2
pile (3) 540:23;547:10;709:12
piles (1) 672:11
pilot (1) 566:20
pinch (2) 518:6;552:24
pines (1) 451:1
pistons (1) 647:24
pitch (1) 594:19
pitted (1) 448:10
pivot (1) 448:13
pixy (1) 664:19
place (12) 463:1;477:4;487:3;517:22;640:7;641:6;643:18;645:10,19;659:7;699:23;735:19
placed (7) 639:23;640:18;644:18;645:2,9,12,13
placement (2) 639:13;641:21
places (2) 474:5;669:6
placing (3) 600:14;639:7;645:22
plagued (1) 480:3
plan (14) 445:13;485:25;488:7,8;531:10;540:17;593:9;601:5;609:5;613:2;619:24;643:7;662:12;712:15
planes (1) 609:6
planned (1) 662:9
planning (3) 610:2;681:17;684:3
plans (3) 527:22;591:19;610:5
plant (6) 486:23;528:2;680:14;701:1;703:12,19
plate (1) 605:19
plates (2) 527:3,4
platform (2) 584:8;585:10
plausible (1) 700:7
play (3) 554:4;586:20;626:16
please (7) 434:10;436:10,20;466:2;629:12;675:15;677:12
pleased (1) 438:6
pleasure (2) 733:5,7
plenty (1) 482:25
plugged (1) 526:19
plus (12) 468:22;472:23;474:3;475:16;499:3;507:18;539:18;590:18;599:21;653:8,23;714:21
point (68) 440:16;449:23;469:10;478:7;490:5;498:20;499:11,18;508:20;509:20;510:24;516:1;518:6;520:16;527:7;529:5;530:13;531:16;532:16;535:1;539:9,25;542:3,8,9,11;552:24;553:12,25;554:1,3;562:5;564:3;574:8;599:17;601:23;602:18;604:21;605:9,10;611:2;612:6;624:6,7;626:4,6,7;627:7,9;639:24;647:1;649:25;652:14;664:2;665:8;669:21;670:19;684:9;691:22;713:16;715:5;717:7;720:12;722:16;724:1;726:17;730:12,14
pointed (5) 483:9;536:14;588:23;595:15;596:20
points (9) 535:4;594:19;654:8,9;681:1;684:8;702:4;714:1,10
polygon (4) 724:3,6;728:12,12
polygons (4) 722:15,16;723:23;727:5
Pool (6) 522:24;562:18;615:24;629:6;699:22;700:17
pools (1) 557:19
poor (2) 608:5;737:7
popular (1) 529:16
port (1) 710:25
portion (5) 535:5;608:25;702:14;710:19;723:2
portions (2) 546:21;562:3
pose (1) 526:25
posed (1) 695:10
position (7) 484:17,18;566:11;567:19;575:21;590:12,20
positions (2) 589:24,25
positive (3) 564:2;569:20;711:15
possibility (3) 595:5;598:8;630:15
possible (17) 462:16;501:24;506:6,22;538:18;545:11;554:8;572:16;593:14;596:5;612:23;685:1,10,16;695:15;706:16;712:16
possibly (4) 527:13;595:8;633:12;647:11
post (1) 643:24
poster (1) 576:12
potential (5) 611:18;634:19;637:6;704:16;711:12
potentially (3) 575:10;628:22;647:5
Power (2) 686:9;713:16
ppd (2) 540:13;604:6
ppm (10) 475:2;476:6;511:17,24,25;524:23;635:9,12;715:14;730:4
practical (1) 576:25
Practicality (1) 577:5
practice (3) 567:4;698:21;729:21
practices (1) 520:14
predesign (2) 531:7;533:5
pre-design (1) 439:10
predicament (1) 679:22
predict (1) 698:17
predictability (1) 581:12
predictable (1) 601:5
predicted (2) 708:13,15
predictions (3) 611:7,11;623:11
predictive (1) 570:20
predominantly (2) 587:18;588:11
pre-dredge (2) 716:23,24
pre-dredging (1) 692:25
pre-established (1) 707:14
prefer (1) 597:7
premiere (1) 710:25
prep (5) 585:25;586:1,10;587:7;589:24
prepare (1) 680:24
prepared (7) 435:22;453:9;505:21;537:18;689:1;734:9;737:7
prepping (1) 586:4
pre-produce (1) 668:12
pre-register (1) 436:7
pre-sampling (1) 683:20
prescriptive (2) 560:25;650:2
presence (2) 447:6;465:5
present (4) 488:17;687:9;693:9;694:15
presentation (24) 433:3,18,23;436:24;441:4;481:10;508:13,21;518:9;532:17,23;544:20;548:20;550:4;551:15;

554:12,21;563:19;
564:4;568:11;
610:24;712:14;
713:16;736:25
presentations (9)
541:5;564:15;
614:12;631:22;
695:8;734:15;
736:21;737:11;738:9
presented (3)
536:5;689:12,17
presenter (1)
436:23
presenters (3)
435:7;614:18;
738:8
preserved (1)
711:7
president (2)
677:22;680:16
press (1)
525:24
presses (3)
451:2;459:6;527:3
pressure (2)
583:19,19
presumably (4)
457:10;465:24;
469:17;718:8
pretend (1)
684:21
pretty (13)
445:20;475:1;
526:9;536:4;550:3;
577:12;578:6;
603:12;612:6;
659:17;700:1;725:8;
737:15
prevent (1)
450:16
prevented (1)
537:5
previous (2)
537:18;729:17
previously (1)
682:8
prices (2)
524:18,19
primarily (10)
444:16;486:24;
539:24;548:5;
552:14;572:19;
578:8;708:12;
726:20;728:10
primary (1)
705:24
principles (1)
617:11
prints (1)
609:16
prior (3)
535:11;597:6;
617:19
prioritize (1)
463:4
prioritizing (1)
541:7
priority (1)
708:3
prism (20)
664:17,22;665:2;
714:3,7,8;715:13,19,
20;716:14;717:11,
13;718:15,17;722:8;
723:9,12;724:12,22;
725:2
prisms (3)
539:25;607:12;
715:10
private (2)
709:18;711:16
proactive (6)
501:21;647:7,12;
681:17;682:2;684:1
proactively (1)
649:6
probably (28)
451:17;452:12;
459:19;466:24;
467:16;470:17;
476:8;489:22;
490:17,18;491:5;
496:15;497:14;
498:3;521:18;533:9;
571:17;636:19;
638:7;639:4;649:24;
666:23,24;683:7;
700:6;719:20;
734:11;737:13
probe (3)
504:12;511:23;
726:10
probes (1)
647:24
probing (1)
726:10
problem (24)
449:23;453:6;
459:8,13,19;496:16;
502:9;503:9;511:13;
528:4;529:3;555:12;
564:22;568:18;
600:1;608:17;
618:22;647:16;
665:10;675:6;684:5,
6;698:3;701:19
problematic (1)
499:22
problems (15)
442:21;452:9;
453:16;454:7;
458:24;466:6;
525:11;526:25;
534:23;556:8;574:4;
577:19;578:20;
698:16;727:24
procedural (1)
482:4
procedure (4)
496:9;526:20;
609:20;643:17
procedures (4)
483:22;694:9,12,
15
proceed (3)
665:20;695:1;
720:20
proceedings (3)
614:23;733:6;
737:6
process (49)
434:15;461:16;
481:20;482:22;
485:2;494:14;
501:17;503:13;
504:6,16;505:11;
512:16;521:10;
531:9,16,18;533:1;
534:24;542:23;
555:2,4;561:4;565:5;
581:16,20,23;
596:22;597:15;
611:5;638:24;
645:14,21;648:8,11;
681:23;682:9;685:6;
686:7,15;701:21;
708:14;713:9,11,24;
723:22;725:11;
728:5;733:14;735:7
processed (1)
521:19
processes (4)
450:9;505:3,4;
531:6
processing (10)
488:9;523:24;
525:23;527:12;
550:17;556:9,19;
559:24;562:9;680:14
processors (1)
459:4
produced (4)
473:24;486:19;
507:24;617:19
production (28)
441:9;463:15,19;
468:4;469:4;472:3,
16;475:18,19,22;
476:13;479:21;
480:13;485:11;
488:25;505:15;
539:22;543:17;
544:2,9,10;553:18;
573:8;583:5;595:11,
12;597:10;662:2
Productive (7)
444:4;488:23;
597:20,21;644:15;
655:12;711:15
Productivity (85)
433:18,22,23;
438:11,12;446:25;
457:23;463:25;
464:24;465:2;
479:20;485:5;486:5;
488:23;489:13;
494:6;515:25;
518:13,19;520:1;
522:6,7;526:3;
529:20;532:5,8,15,
19;533:17;534:5,22;
537:10,12;539:23;
540:5;541:15,19;
546:15;547:5;
549:14;550:15,21;
551:4,18,22;556:19;
559:13,21;563:7,12;
572:2;573:1,12;
575:3;581:24;
582:20;583:21;
585:4,13,16,19,21;
596:3;597:12;598:4,
7,16,20;603:6,12,16,
22;605:16;606:14,
21,25;607:15,20;
611:1;644:19;661:4;
681:4,8;708:4,6
products (1)
666:17
Professional (2)
433:11;516:20
profile (2)
718:19;719:18
profiles (3)
673:5;719:12,17
profoundly (1)
679:4
Program (20)
439:11,12,22;
454:13;567:11;
583:25;584:12;
603:1;643:3;647:18;
658:2,12;697:17,23;
708:25;714:12;
716:11;721:18;
726:1;727:9
progressed (1)
706:3
progression (1)
698:14
prohibition (1)
549:9
prohibitions (1)
541:6
prohibitively (1)
679:20
Project (111)
432:25;437:6,16;
438:6;439:4;440:1,
18;443:4,18;469:16;
480:4;483:24;
484:15;488:14;
492:5;496:24;
512:10;514:10,12,
14,17;520:6;522:19;
529:16,18,22;532:4,
12;533:4,10,23;
534:13,16,25;535:9,
11,24;539:4;541:2,
12;543:13;547:3,15,
21;548:3;549:7;
554:24;556:14;
558:8;563:1;564:2;
567:16;568:16,23;
569:20,21;577:14;
580:7;583:18,20;
584:24;592:23;
601:21;606:17,17,
18,20;607:4;610:4;
612:3,12;628:25;
655:11,17;658:19;
660:19,22,25;671:9;
680:13;686:4;
687:21;688:3,19;
695:11;702:1,4,18,
18,22;703:3;704:6,
10,12,16,19,25;
705:1,10,14,17,18,
19,21;706:1,3,16;
707:3,5,21;709:2
projected (1)
594:23
projection (1)
535:20
projections (1)
634:14
project-related (1)
694:5
projects (1)
514:3
project's (1)
535:23
prolong (2)
676:23,24
promise (1)
658:15
proof (1)
476:4
proper (2)
482:15;630:7
properly (1)
719:23
proposal (7)
579:8;581:8;
628:22;676:4,11,22;
677:2
proposals (2)
663:14,22
propose (3)
557:6;614:10;
634:17
proposed (8)
437:24;444:3;
594:15;611:3;
632:23;647:5;

663:10;676:2
proposing (3)
495:14;544:22;
617:17
proprietary (1)
524:11
prospective (1)
555:16
protect (7)
576:18;579:20;
580:12;616:9,22;
708:2;709:5
protecting (3)
576:5;579:15;
684:1
protective (1)
676:16
protocol (1)
596:25
prototypes (1)
671:12
proud (1)
584:11
prove (4)
488:11,14;524:1;
583:15
proved (1)
499:22
provide (9)
442:6;614:8;
633:9;640:15;
641:12;648:23;
650:16;686:3;719:20
provided (4)
617:12;648:18;
705:3;734:16
provides (4)
435:18;453:23;
613:24;700:17
providing (1)
526:9
provocative (1)
738:11
public (31)
434:4,10,12;435:1,
12,16,20,24;436:12;
489:9;492:21;
579:21;673:25;
674:4,10;675:11;
688:5,9,24;735:3,5,6,
11;736:7,13,14,15;
737:20,24;738:5,6
publication (1)
617:20
publicly (1)
695:16
published (1)
617:14
pull (1)
619:14
pulled (2)
437:8;603:25
pulling (1)
509:13
pump (3)
450:11,12,15
Pumpkinseed (1)
697:19
pun (1)
554:13
pure (3)
458:6;526:12;
567:20
purely (1)
591:8
purpose (3)
441:3;490:4;
665:23
purposely (1)
506:14
purposes (1)
608:21
push (4)
490:25;511:22;
647:8;673:11
pushed (1)
475:25
pushing (2)
545:17;605:18
put (32)
436:15;448:2;
467:20;471:17;
497:15,17;519:22;
520:23;526:1;551:3;
553:14;557:18;
559:3;561:9,18;
576:19;593:2;
602:17;630:3;637:3;
643:6;644:24;
649:21;684:20;
713:7,11,15;724:11,
14;725:20;734:6;
738:9
puts (3)
563:17;567:18;
591:11
putting (9)
548:9,10;556:15;
557:11;590:4;
593:10;599:11;
620:16;691:19

Q

QAPP (1)
610:4
Quality (17)
534:18;556:24;
590:10;599:1,3,7;
600:23,24;602:22;
678:23;681:10;
687:23;702:19;
704:12;705:2,20;
707:25
quantify (1)
556:11
quantitative (2)
629:16;638:10
quantitatively (1)
624:10
quantity (3)
598:25;626:5;
664:8
quarter (1)
474:6
questionable (1)
693:5
question's (1)
663:6
queue (1)
675:14
Quick (2)
562:16;667:4
quicker (3)
492:9;518:4;
662:19
quickly (7)
493:13;559:2;
572:16;614:15;
644:18;655:14;
713:23
quit (1)
529:12
quite (9)
457:5;517:7;
553:2;556:1;577:14;
615:2;652:10;
667:19;731:12
quote (3)
485:18;510:1;
568:14
quoted (1)
595:24
quoting (1)
514:4

R

racquets (1)
615:12
rail (2)
528:5;529:4
railroads (1)
711:5
rain (1)
525:8
raise (5)
632:10;675:10;
676:1;684:9;702:5
raised (4)
549:18;574:9;
587:12;677:13
raising (2)
684:13,15
ram (1)
727:15
ramifications (1)
607:3
ramp (2)
543:22,25
ramping (1)
539:22
ran (5)
442:7;445:3;
446:15;512:22;
533:23
range (10)
476:12;501:3;
538:18;539:7;
593:25;700:13;
706:24;710:4;731:6,
8
ranges (2)
543:16;731:19
rapid (2)
601:11;727:19
rarely (1)
730:17
rate (37)
441:9,10;442:3;
443:5,8,9;446:22;
447:4;460:12;
463:14;486:2,10,25;
488:9;489:1;540:10,
11;544:8;547:16;
549:25;550:22;
551:21,22;553:18;
574:2;578:9;589:16,
17;590:24;603:16;
604:16;630:13,14;
691:5;694:17;
707:11;708:19
rated (1)
449:2
rates (10)
460:1;469:4;
472:16;566:21;
622:17;625:24;
642:18;661:4;662:2;
673:18
rather (9)
476:19;489:1;
492:3;501:21;
514:24;586:18;
663:14;690:17;
706:17
ratio (1)
653:12
reach (6)
465:11;608:11;
629:21;633:13;
660:11;695:11
reached (3)
442:4;572:25;
646:24
reaching (1)
523:6
reactive (3)
501:21;647:7;
683:25
reactively (1)
649:7
read (9)
434:22;459:7;
487:19;544:12,13;
653:19;677:21;
696:21;707:7
readily (1)
527:25
reading (1)
714:2
ready (11)
452:23;454:24;
456:10,11;460:21;
469:2;477:25;
530:24;557:25;
583:7;675:15
real (7)
487:8;531:24;
566:15;567:2;599:9;
671:16;733:22
realistic (4)
489:12;546:8;
613:18;625:20
reality (1)
583:17
realize (3)
551:7;603:17;
711:12
realized (4)
533:9;598:5;
600:16;715:1
really (46)
434:8;446:23;
458:10;461:3;
467:25;474:19;
476:4;492:7,13;
495:19;507:1;
533:10,17;535:4;
549:11;551:20;
559:11;560:8;563:1,
18;570:11;574:23;
575:16;580:15;
586:17;591:21;
601:24;602:20;
604:10;618:20;
622:18;629:20;
632:15,20;634:3;
640:12;650:2;651:2;
657:8;673:3;683:21;
684:10,17;729:24;
731:17;734:11
real-time (3)
534:14;610:9,12
reason (13)
470:14;475:23;
477:17;509:21;
550:7;558:3;572:5;
597:18;659:22;
661:3;662:9,19;
727:4
reasonable (9)
508:25;524:4;
539:4;563:6;574:13,
14;585:3;664:12;

677:5
reasons (6)
482:14;487:18;
535:18;562:23;
638:6;731:23
reassessment (2)
687:15;701:21
rebar (1)
513:16
rebars (1)
513:3
rebuttal (1)
615:4
re-capping (1)
644:15
receive (1)
510:8
received (1)
663:9
recess (2)
530:21;674:5
re-characterize (2)
581:10;651:3
re-characterizing (1)
539:18
recognition (2)
576:1;706:1
recognitions (1)
618:2
recognize (2)
506:21;664:25
recognized (3)
567:13;619:4;
649:3
recognizes (1)
702:12
Recognizing (4)
470:16;647:13;
649:17;727:23
recommend (5)
501:8;654:17;
672:2;703:5;711:25
recommendation (16)
495:20,22,25;
500:14,25;512:17;
520:17,23;521:21;
522:1,5;559:19;
602:9;654:24;657:9;
666:10
recommendations (14)
500:10,18;560:20;
561:6;563:21;
564:11;565:10;
578:3;602:1;658:1;
685:20;704:8,22;
705:2
recommended (3)
661:2;672:13;
693:14
recommending (2)
656:7;695:3
recommends (3)
680:6;703:20;
707:22
reconcile (1)
576:21
reconstruct (1)
610:18
re-contamination (1)
638:4
record (7)
435:24;436:16;
675:11;696:7;
701:23;702:21;
703:23
re-core (1)
648:22
recovery (6)
618:5;627:19;
676:24;708:13,15,19
recreational (1)
517:5
re-cut (1)
581:11
recycling (1)
591:9
red (2)
531:18;539:16
re-define (2)
491:2;649:21
re-delineating (1)
542:25
re-deposited (1)
627:17
re-deposition (1)
639:18
redesign (1)
607:12
re-digging (1)
580:20
redistribution (2)
629:8;730:20
redo (1)
555:4
re-draw (1)
496:7
redredge (4)
543:1;715:19,20,
21
re-dredge (1)
725:5
re-dredged (2)
545:20;723:9
redredging (11)
539:17;540:3;
543:6;554:19,21;
555:7;556:12;
571:23;581:19;
604:19;607:24
re-dredging (1)
598:12
reduce (14)
482:11,16,20,20;
483:3;494:16;547:2;
569:25;576:12,13;
595:7;611:4;657:10;
702:22
reduced (7)
454:9;469:4;
541:18;690:17;
692:24;693:24;
707:11
reducing (2)
549:13;607:22
reduction (7)
463:14;547:4,20;
639:6;676:4;685:10;
702:20
reestablish (1)
722:7
refer (1)
574:19
referee (1)
615:11
referred (3)
509:8;548:19;
639:2
refill (1)
469:17
refilled (1)
469:14
reflect (2)
601:2;632:20
refueling (1)
449:19
refusal (1)
556:4
regard (7)
494:9;510:14;
514:9;547:13;607:5;
665:9;671:2
regarding (7)
531:6;543:8;
599:13;636:10;
676:1,13;734:23
Regardless (1)
715:9
regards (3)
510:19;631:14;
680:15
region (1)
633:3
register (2)
434:6,10
regular (1)
537:19
regularly (1)
679:16
regulations (1)
679:14
reintroducing (1)
548:4
reiterate (1)
681:12
rejected (2)
458:25;676:15
rejects (1)
459:1
relate (2)
617:15;664:7
related (11)
530:8;548:6;
559:15;570:3;
588:10,11,17;
590:16;632:22;
690:15;706:5
relates (3)
575:6;628:6;629:7
relationship (5)
529:19;532:18;
574:22;687:21;
699:13
relationships (3)
572:21,23;629:18
relative (7)
532:5;537:9;
561:25;599:18;
607:11;637:19;
727:22
relatively (5)
447:10;472:16;
525:2;608:25;639:15
relaxing (1)
495:15
relay (1)
632:21
release (8)
546:10;625:11,24;
635:17;637:5;664:8,
16;706:5
released (1)
524:12
releases (5)
658:4,9;659:12;
703:11,18
releasing (1)
664:18
relevant (1)
684:11
relied (1)
596:22
relief (2)
544:23;559:7
rely (1)
623:10
remain (4)
579:22;660:22;
676:9;694:2
remaining (1)
733:14
remarks (5)
435:22;481:5;
677:11,14;732:14
remedial (3)
445:13;533:2;
707:10
remediated (2)
682:25;683:12
Remediation (8)
509:25;523:1;
606:18,20;617:13;
682:5;685:22;696:10
remedy (19)
502:12;535:22;
555:15;563:3;
565:13,18;575:20;
576:6;578:1;579:6,
14,16;580:13;
618:14;676:7,15;
677:4,8;707:1
remember (9)
514:5;550:18;
554:9;612:2;620:14;
622:5;628:10;
643:10;714:10
remind (4)
653:6;673:24;
697:9;737:17
removal (23)
438:20;505:16;
507:2;538:11;
540:11;543:4;544:2;
547:13;550:21,24;
580:15;581:3;598:6;
612:5;618:5;639:2;
676:5;686:8,10;
695:12;702:8;708:6;
716:5
remove (13)
473:18;475:14;
496:3;505:17;
509:10;561:2,7,25;
570:4;574:2;618:8;
649:19;686:16
removed (20)
437:8;438:18,25;
510:2;536:9,15;
537:22;539:15;
540:6;543:9;547:9;
554:25;555:1;618:7;
667:7;690:13,24;
691:18,21,24
removing (8)
458:22;480:9;
536:7;559:17;
596:15;601:9;
602:23,24
reopen (1)
437:17
repaired (1)
527:19
repeat (2)
568:5;651:21
repeated (1)
664:13
repeatedly (1)
693:14
replace (2)
566:12;567:19
replaced (1)
644:9
report (57)
445:12,18;453:9,
15,19,19,20,22;
457:6,23;459:7,8;

495:23;500:19;
509:7,12;510:8;
515:4;526:2,4;
538:20,23;544:13;
559:18;563:9;
571:10;585:20;
601:14;602:2,11;
609:13,24;610:6;
630:4,20;631:19;
663:7,13;664:3;
665:9;690:7,11,19;
691:4;693:2;704:1,3,
5,20;719:22,22;
732:18,20,21;
733:19;736:2,5
reported (2)
666:4;720:8
reporter (2)
552:9;737:8
reporting (1)
531:11
reports (20)
437:24;463:25;
484:19,19;513:22;
514:8;516:17;
606:13;617:9;
618:19;628:19;
629:19;648:24,25;
657:10;689:13,16;
733:21;734:9,25
repositioning (1)
455:18
represent (2)
709:20;724:21
representing (2)
677:20;701:14
represents (3)
538:17;723:1,3
request (1)
629:14
requests (1)
663:12
require (6)
442:21;498:19;
633:4;641:7;661:9;
730:23
required (15)
441:23;443:10;
451:8,16;486:7;
507:2,5;536:25;
557:5,18;641:24;
648:11;652:2,4;
726:6
requirement (5)
485:14;641:1;
642:3;648:9;695:12
requirements (5)
476:24;479:20;
486:5;663:23;688:22
requires (3)
448:20;519:21;
679:11
requiring (1)
447:13
re-read (1)
485:21
re-run (2)
632:23;633:2
re-sample (1)
648:21
resampling (1)
607:10
reschedule (1)
734:1
Research (3)
566:24;658:19;
671:15
Researcher (1)
689:3
reset (1)
497:21
residences (1)
687:25
residential (1)
557:2
residual (39)
475:4,8;476:1,5,9,
15,20;500:13;
505:14;539:19;
554:20;560:13;
563:24;573:11,13;
595:21;607:25;
609:2;611:20;
641:23;665:2;676:2;
681:6;686:16;694:7,
14;714:9,13,16,22;
715:3,11;721:23;
722:19;729:15,23;
730:18,24;731:1
residuals (15)
482:15;503:19,25;
580:17;649:14;
650:3;653:10;
661:24,24;664:16,
17,24;681:3;709:7;
730:2
resistance (1)
671:17
resolution (1)
696:7
resolve (5)
482:7;527:20;
555:25;561:16;690:1
resolved (1)
692:19
resource (1)
688:24
resources (4)
514:18;610:6;
687:23;697:1
respect (11)
510:10;513:21;
514:11;564:20;
565:7,24;640:24;
641:24;708:21;
729:14,15
respectful (1)
436:19
respects (1)
514:6
respond (12)
557:25;564:13;
592:7;615:6;629:12,
13;632:5;651:19;
664:4;667:16;718:5;
731:22
response (4)
557:24;558:1;
651:23;665:21
rest (2)
592:23;682:6
restoration (1)
676:21
restore (1)
679:24
restoring (1)
680:10
restricted (2)
680:3;711:23
restrictions (4)
548:7;549:1,2;
646:20
result (16)
439:17;472:6;
547:20;548:18;
658:16;664:20;
676:12,20;680:4;
681:12;689:23;
691:8;692:21;
703:13;709:3;711:24
resulted (3)
459:19;604:7;
676:17
resulting (2)
692:4;695:21
results (11)
468:17;474:23,25;
531:11;564:1;
629:17;653:7;
666:12;693:5;703:1;
725:20
resumed (1)
692:20
resumption (1)
682:13
resurvey (1)
600:9
resuspended (1)
611:10
Resuspension (84)
453:25;455:25;
465:24;469:6;
482:14;483:4;
505:14;542:20;
545:8;547:3,16,18,
21;548:2,5;549:4,13;
550:14,20;551:1,2,
11,16,23;552:3;
553:23;557:17;
560:5,12;563:10,17,
23;565:12,25;
566:15,22;567:2,8;
570:2,2,23;571:2,9,
19;573:2,4,16,20;
574:4,6;576:16;
578:9;595:20;603:9,
23;610:25;611:4,19;
612:4;616:1,10;
622:16;626:22;
634:11;659:24;
670:18;676:3;681:3,
5;682:17;683:2;
684:2;685:3;688:3;
691:1;692:3,22,24;
693:13,16;694:6,21;
695:20;709:6
retail (1)
710:5
retained (1)
582:5
retired (1)
438:8
retrieve (1)
448:1
return (1)
519:18
Review (26)
433:1,2,7;434:15;
435:21;436:11;
482:17;516:11;
568:2;682:9;686:7;
689:9,15;693:19;
695:9;696:13,14;
706:12;723:5;733:4,
23;735:17;736:2,5,
12;737:20
reviewed (3)
505:22;531:14;
540:18
reviewers (1)
688:16
reviewing (2)
487:12;687:13
revisions (1)
582:6
revisit (1)
664:2
revisiting (1)
493:11
revitalization (1)
711:14
Reynolds' (1)
519:12
Richard (1)
709:16
Richter (3)
696:20,24,25
Rick (8)
485:7;495:7;
508:18;515:22;
525:17;646:17;
651:18;656:25
rift (1)
685:13
rig (1)
649:8
right (51)
432:10,15;437:20,
21;445:21;448:11;
452:20;456:19;
458:19;472:22;
476:5;478:3,13;
481:20;483:13;
487:21;492:13;
497:11;498:15,18;
515:9,12,21;530:19;
549:22;579:4,9;
584:24;594:20;
595:20;603:10;
608:16;619:19;
625:13;636:17;
638:21;640:8;
642:17;644:4;
655:20;658:18;
663:1;700:10;
707:19;709:11;
712:21;713:25;
718:3;729:6;732:11;
733:19
rigorous (2)
440:12;531:15
rigs (1)
648:7
rings (1)
648:13
risk (8)
492:11;622:22;
625:5,16;629:11;
639:6;691:11;702:20
risk-based (1)
580:9
risks (3)
583:23;623:4;
624:18
River (83)
437:4;442:18;
443:23;452:1,23;
454:24;458:2;465:7;
466:4;474:1;482:13;
483:5;492:12;525:8;
530:4,11;533:16;
548:16;553:5;
556:21;558:5;
559:17;561:8;
562:12;566:20;
572:17;577:7,7,12;
580:9;605:8;606:23;
624:1,3,5,9,12,15,19;
625:2,4;626:23;
627:10,24;630:23;
631:6,15;634:1,18;
635:20;637:7,11,18,
22;644:17;645:20;
648:4;661:12,13;
668:2;669:23;676:8,

25;681:7;682:18,24;
683:7;684:24;
685:11;686:13;
687:14,22;688:5;
690:4,22;692:2,5;
695:22;701:19;
702:10;708:23;
710:19;728:11
RIVERS (2)
709:13,16
riverside (1)
687:24
road (2)
500:22;734:22
robust (1)
678:15
rock (10)
513:4,17,19;548:9;
581:19;587:21;
672:24;673:17;
716:17;726:15
rocks (1)
509:14
rocky (1)
513:13
ROD (20)
491:23;493:8;
502:12;524:22;
641:5;676:10,14;
683:4;688:22;
691:13,17,21;
695:12;696:9;
705:13,25;707:7,8,
19;708:10
RODS (1)
617:18
Rogers (11)
454:3,6;462:3,22;
467:2;540:22;
555:22;588:22,24;
672:25;673:2
role (2)
518:12;558:6
rolling (2)
537:16;538:2
rooted (1)
679:4
Ross (1)
647:19
roughly (3)
549:23;609:7;
699:4
round (3)
449:7;452:6;615:9
rounded (1)
463:17
route (1)
678:17
R's (1)
567:11
rule (3)
599:6;621:3;
737:25
rules (5)
435:6,12;643:21;
674:13;737:18
Rumsfeld (1)
568:13
run (6)
442:25;450:23;
483:19;623:25;
624:17;626:2
running (8)
443:22;444:22;
453:19;478:7;527:9;
533:25;651:5;727:11
runs (2)
433:7;668:2
ruptured (1)
584:10
rushing (1)
478:22

S

Safe (1)
738:13
safety (12)
529:21;530:2,4;
559:2;583:12,13,16,
25;584:12;585:13,
17;685:12
sake (1)
602:24
salient (1)
698:9
same (23)
441:24;447:4;
463:22;479:25;
517:12;538:10;
540:15,25;543:3;
556:12;566:19;
586:9;631:20;638:5;
640:16;645:25;
654:7;660:21;666:3;
700:8;714:11;720:1;
721:20
sample (24)
458:13;469:21;
470:24;474:15,23;
479:9;480:18;491:1;
497:24;498:21;
499:8;555:5;647:18;
649:9;650:23;
666:14,18;668:3;
673:10;695:1;
714:11;716:12,15;
726:12
sampled (5)
469:24;470:1;
473:20;479:10;511:2
samplers (1)
647:21
samples (30)
474:14,25;476:22;
496:5,6;497:1,11;
498:1,2,5;501:6;
507:6;621:15,15;
626:23;634:14;
635:8,10,11;648:4,
11,12;649:18;668:6;
714:9,13,15,17;
719:25;725:24
Sampling (25)
439:11,22;468:16;
479:7;495:17;
496:13,19;500:15;
501:8,10,15;542:24;
597:16,17;608:10;
633:5,8;639:14;
642:25;648:10;
651:11;683:19;
694:25;721:3;726:25
sand (1)
526:10
sandbar (2)
523:13,20
sands (1)
526:11
sandy (1)
621:16
Saratoga (4)
687:3;688:1,12,14
sat (5)
455:8;460:20;
540:16;620:20,21
satisfied (1)
643:12
save (1)
606:10
saw (10)
490:14;555:1;
578:10;620:21,22,
25;631:21;699:14;
729:20;731:16
saying (13)
452:13;489:17;
494:2;497:18;508:7;
585:3;586:18;
627:15;636:24;
651:10;663:14;
687:11;729:3
scale (2)
439:4;625:24
scaled (1)
658:6
scaling (1)
561:23
SCEMC (4)
687:5;688:2,25;
689:3
SCEMC's (1)
695:13
scenario (2)
464:21;708:19
scenarios (1)
624:13
schedule (15)
434:14;524:10;
537:10;538:22;
543:24;545:18;
547:12;555:8;651:4;
733:15,23,25;
734:20,23;736:10
scheduled (2)
445:13;692:12
scheduling (1)
662:16
SCHROEDER (13)
525:21;526:22;
527:11;528:13,21;
594:21;595:17,23;
606:3;610:23;
670:17;671:5;721:1
science (1)
687:13
scientific (1)
440:13
scope (5)
434:25;435:3,20;
514:11;643:6
scow (69)
445:8;446:12;
447:17,20,24;448:2,
7,17,23;449:25;
450:3,10,18;451:4;
455:9,11,24;456:24;
459:25;460:22;
461:20;462:5,17,20;
463:5,6,8;464:10;
466:1,7,18;467:4,8,
13,21,22;471:5,5,10,
16,18,20,23;478:20;
480:2;482:6;515:24;
516:17,19;517:10,
11,17,21;519:6,13,
23;520:7;524:3;
549:19,21;550:12,
16;551:2;552:12;
586:3,6,7;590:11;
660:12
scows (53)
444:20,21,22,24,
25;445:4,5,15;446:3,
7,15,16,19,20;447:1,
3;454:8;459:20,21;
462:15;463:18;
464:1,3;466:24;
471:14;472:7,9,11,
14;475:24;478:9;
479:18;480:10;
486:25;487:25;
516:4,5,13;517:8;
518:3;519:11,18;
520:18;521:1,12;
549:24;551:10;
552:22;553:14;
559:23;565:4;586:5;
590:19
screen (9)
447:18;448:3,4;
459:1;516:14;
526:18;712:19;
728:14,21
screens (1)
448:8
Sean (1)
519:12
seaport (1)
711:1
season (30)
444:1,7,17;452:3;
453:2;478:23;
486:17;533:7;534:1;
538:24;539:5,21;
542:3;545:6,21,24;
584:6,20,22;585:1,1;
600:20;604:5;
658:11,14;660:13;
662:17,21;682:12,12
seats (1)
674:8
second (26)
449:5;454:12;
465:3;478:25;
491:13;520:23;
554:18;559:23;
560:9;573:12;593:1;
594:24;595:8;597:5,
20;599:4;613:8;
626:18;638:14;
644:10;660:20;
672:18;722:8;725:2,
6;730:24
secondary (2)
571:12;730:3
section (7)
522:24;637:18;
661:12,13;699:5,6;
724:21
sections (3)
442:20;637:12;
697:11
sector (2)
709:18;711:16
sediment (64)
438:18;439:10,20;
450:3;457:21;
462:20;466:25;
468:15;469:21;
472:12;478:15,17;
503:12;504:12,15;
506:10;507:3;
509:25;510:1;513:5,
17,19;525:23;
536:15,18;537:2;
539:14;540:11;
543:4;544:2;556:17;
557:13,15;561:9;
570:8;589:25;
602:24,25;617:13;
618:3,9,10;621:1;
622:13,24;624:25;
632:20;633:11;
635:3,23,24;636:25;

638:9;639:8;643:9;
653:6;667:6,9;
679:22;686:8;708:7;
715:3;720:6;730:1
sediment-based (1)
694:4
sediments (3)
631:23;632:16;
686:11
seeing (5)
600:11;620:25;
623:23;625:20;
712:13
seem (3)
491:20;500:2;
690:16
seemed (2)
493:17;550:25
Seems (15)
487:18;488:3;
491:19;493:11;
514:19;560:25;
599:8;606:15;
610:13;625:23;
639:11;647:2;
664:23;687:10;
695:10
segment (4)
583:6;621:18;
674:9;723:3
segments (1)
477:1
segue (3)
614:2;628:9;
734:20
select (1)
718:25
selected (3)
557:10;563:3;
707:1
send (8)
511:8;520:10,12;
529:4;575:18;576:8;
578:25;634:6
sending (3)
478:8;523:24;
681:18
Seneca-Cayuga (1)
710:17
sense (15)
501:11;502:2;
510:21;527:14;
541:22;553:20;
587:2;594:10;
612:12;621:7;
632:13;650:4;669:9;
671:23;684:12
sent (3)
455:9;578:7;
633:24
sentence (3)
487:19;691:1,2
separate (2)
450:24;572:8
September (2)
612:7;660:13
sequencing (1)
662:12
sequentially (2)
729:10,12
sequester (1)
581:18
series (5)
539:11;579:17;
612:23;613:5,13
serve (1)
709:23
served (1)
688:11
service (1)
462:23
serviced (1)
464:10
serving (1)
687:24
session (3)
530:22;602:17;
657:5
set (32)
435:24;481:23;
486:1;511:19;
577:24;579:9,23;
580:6;605:2,6;609:6;
616:11;619:24;
624:10;625:9;
630:14,18;655:4;
692:15;708:16;
714:3;715:9,13,18;
717:1;718:15,17,19,
24;720:13;728:9;
736:17
sets (2)
638:9;713:2
setting (4)
548:20;553:24;
632:17;690:25
settled (1)
727:15
settling (1)
625:4
seven (11)
449:15;459:21;
472:11;534:1;
544:17,22;587:24;
669:19;674:20;
675:2;719:25
seventh (1)
544:24
seventies (1)
437:23
several (8)
494:12;518:17;
586:19;607:3;611:2;
693:18;696:5;702:4
severe (1)
528:3
shaker (1)
497:7
shallow (16)
471:8,12;481:1;
518:16,21;523:8,11,
19;533:14;552:18;
587:12;592:21;
593:5;660:11;
661:16;716:10
shallower (2)
660:10;716:3
shallowness (1)
593:20
share (4)
532:3;717:21;
730:11;733:10
shared (1)
736:21
sheen (12)
541:11;549:11;
557:16,21;558:19;
664:6,6;665:17;
666:3;668:22;669:1;
693:3
sheens (8)
558:7,11,22;571:9;
659:14;666:17;
669:5,11
sheer (1)
465:17
sheet (3)
540:23;547:10;
672:10
sheets (2)
496:12;737:12
shells (1)
686:12
shift (5)
449:18;452:19;
457:7,8;583:1
shifted (1)
711:5
ship (1)
537:1
shipment (1)
524:2
shipping (3)
537:5;711:3,4
shoals (1)
523:17
shoot (2)
442:14;443:1
shore (2)
441:2;668:14
short (9)
441:15;548:17;
554:10;588:1;
618:17;656:4;
660:11;671:21;734:7
shorter (1)
492:10
shortest (1)
695:14
short-lived (1)
638:1
shortly (1)
678:8
short-term (1)
702:10
shot (1)
485:21
should'a (1)
489:3
show (12)
432:15;464:7;
470:18;472:4;
476:14;490:6;
513:12;524:23;
607:22;635:10;
658:15;697:21
showed (12)
483:18;547:15;
550:23;573:23;
595:17;598:16;
612:25;624:15;
631:14;658:14;
706:6;729:22
showing (6)
459:24;476:2;
517:2;715:23;722:2;
724:24
shown (2)
469:21;630:24
shows (10)
464:22;466:15;
470:25;561:19;
585:22;586:10;
592:18;613:14;
632:5;725:3
shuffle (2)
614:3,14
shut (13)
453:4;454:2;
460:23;463:3,9;
479:12;540:14;
545:7;546:22;
550:19;551:3,22;
616:18
shutdown (11)
477:20;540:16;
541:18;542:20;
546:18;557:18;
603:9,17;604:8,24;
616:13
shut-down (1)
456:15
shutdowns (2)
546:17,21
shy (1)
536:8
sic (1)
573:5
side (9)
506:23,24;585:17;
589:2,4;605:19;
672:25;673:2;738:3
sides (3)
446:8;466:21;
520:20
sign (3)
436:4;674:1,20
signal (1)
634:8
signed (3)
674:16;675:3;
677:22
significance (2)
637:24;678:25
significant (14)
494:24;555:24;
558:5;562:3;571:4;
586:15;632:5;
637:25;659:17;
690:4;699:7,9,10;
702:14
significantly (4)
483:12;697:11;
699:2;701:4
sign-in (1)
737:12
silt (2)
450:22;451:1
silty (1)
526:11
similar (7)
440:2;448:5;
537:21;539:12;
566:21;703:9;737:3
simple (2)
561:23;578:6
simpler (2)
612:21,22
simply (2)
684:15;691:20
simultaneously (1)
736:6
sincere (1)
689:24
single (3)
639:10;713:16;
728:21
sit (5)
432:20;455:10;
484:13;610:10;
685:15
site (22)
457:12,12;459:22;
471:4,7;479:18,18;
491:22;496:12;
519:9;520:12;528:7;
529:5;533:12;569:2;
593:9;618:4,6;
620:13;703:12,19;
706:20
sites (4)
561:6;571:6;
618:3;682:7
sitting (8)
451:25;452:16,22;

456:13;464:5;472:8;
484:21;625:9
situation (4)
588:8;635:5;
673:5;715:1
situations (3)
556:4;601:6;672:7
six (42)
439:8;443:18;
444:12;452:2,13;
459:21;461:24;
462:13,25;463:10;
469:14;474:22;
475:3,4,10,15,15;
476:4;480:11;
486:12;490:12;
492:5;503:17;511:7,
19;519:10,14,20;
525:9;527:3,4;
533:24;599:25;
600:10;620:19;
621:5;708:10;
714:23;722:9;723:1;
726:12,13
six-day-a-week (1)
443:25
six-inch (3)
475:7,17;477:1
six-year (1)
708:7
size (9)
445:16;483:25;
484:16;512:25;
524:4;583:19,20;
593:14;671:10
sizes (3)
445:18;461:14,17
slab (1)
447:6
slide (10)
466:2;470:25;
476:18;479:16;
495:10;564:6;
576:11;602:20;
725:18;733:25
slides (5)
481:8;550:19;
603:6;722:12,13
slightly (1)
432:2
slipped (1)
584:10
slop (1)
466:20
slope (3)
609:1,3;724:11
sloping (1)
728:3
slow (3)
458:19;517:4;
648:7
slowed (2)
459:5,15
slower (1)
650:22
slows (2)
581:21,22
small (13)
462:14,24;497:5;
517:22;558:21;
565:3;600:21;
650:23;669:2;
688:12;697:19,20;
699:8
smaller (9)
444:12,22;445:17;
446:5;462:7,17;
517:22;626:25;660:9
smile (1)
648:2
smirk (1)
648:1
Society (4)
677:20,22;680:5,
16
soils (2)
458:5;470:5
solely (1)
705:22
solitary (1)
678:20
solution (1)
608:13
solve (1)
482:1
somebody (4)
463:7;508:6;
518:5;645:2
somehow (1)
655:10
some-odd (1)
441:19
someone (1)
619:16
sometime (1)
502:21
sometimes (6)
503:14;506:22;
558:12;606:5;
719:12,14
somewhat (5)
439:16;441:15;
513:25;518:14;
556:11
somewhere (1)
610:19
somewheres (1)
475:19
soon (4)
463:5;492:22;
712:17;735:13
sooner (2)
605:19,22
sophisticated (1)
510:3
sorry (13)
521:16;522:13;
529:10;550:1;
551:24;552:10;
574:16;575:14;
636:5;646:21;
655:25;696:21;
727:14
sort (11)
481:20;564:14,22;
599:12;630:20;
637:7;671:14;
673:11;713:8;
722:22;724:19
sound (1)
525:3
sounding (1)
564:15
sounds (2)
488:20;594:8
soup (1)
610:7
sources (2)
688:5;693:7
south (4)
462:21;471:7;
609:10;672:11
span (1)
436:3
spare (1)
481:9
speak (7)
434:5,9;436:7;
447:16;510:17;
513:25;530:7
speaker (2)
709:15;736:11
speaking (2)
506:16;526:8
speaks (1)
730:19
spec (6)
498:10;507:9,11,
18;508:11;596:21
specific (8)
500:10;532:11;
607:19;618:6;
663:19,21;697:4;
704:21
specifically (4)
495:4,14;507:1;
662:8
specifications (1)
596:17
specified (4)
480:7;679:13;
706:8;711:21
specify (1)
505:15
specs (1)
507:14
speculate (1)
663:1
speculating (1)
668:8
speculation (1)
665:11
speed (2)
520:5;727:5
speeding (1)
611:5
spelled (1)
641:22
spend (6)
473:5;480:9;
496:2;513:10;528:1;
647:15
spending (1)
600:19
spent (7)
571:24;580:19;
587:19;607:10;
637:12;730:6,15
spill (2)
557:24;558:1
spill-out (1)
558:5
spirit (1)
689:6
spoke (3)
514:2;546:16;
599:10
spoken (1)
586:17
spooky (1)
512:1
spot (6)
471:8,12;473:9;
478:11;481:1;523:18
spots (3)
476:7;513:6;
523:13
spread (1)
542:4
spring (4)
437:6,19;627:2;
634:5
spud (2)
570:14;668:20
spuds (2)
480:10;600:14
square (4)
474:8;600:5;
613:9;663:18
squares (4)
474:4,18;507:25;
600:7
SRA (5)
432:24;433:1;
733:3;736:1;737:4
SSAP (13)
439:12;650:8;
667:12;714:5,12;
716:11,19;718:18;
720:22;721:18;
725:19,25;727:9
stability (2)
590:8;671:20
staff (3)
435:17;737:21,22
staffed (2)
452:22;454:24
stage (2)
533:15;548:16
stages (1)
532:8
staging (1)
540:19
stall (1)
505:10
standard (82)
438:11,12,15,19;
439:6;442:1;444:4;
464:25;472:25;
485:10,13;486:11;
487:11,16;488:5,19,
21;489:4,18,24;
491:11;495:5,16;
496:10,12;497:22;
498:8,10;499:15,20;
503:22;506:7;532:1;
535:5;539:10;
540:13;556:24,25;
560:6,12,13;561:14;
562:8;563:23,24;
568:2;574:7;576:19;
603:23;604:7,15;
606:16;607:25;
616:1,11;621:3,7;
622:16;623:25;
630:17;637:20;
640:24;641:23;
642:14;643:23;
649:12;654:1;
655:18;661:2,24;
663:11;664:24;
670:2,9;677:4;691:1,
19;694:7,14;708:5,6;
730:23
standards (81)
475:9;481:22;
483:8,14;485:19;
487:5,12,23;488:4,6;
494:7;500:13;
506:19;523:14;
532:18;534:18,19;
556:25;560:10,23;
563:16,21;564:12,
25;565:8,14,18;
567:23,24,25;568:7;
569:18;571:19;
572:21;573:10;
574:25;575:2,2;
576:2,5,17;577:1,24;
579:17;583:21;
592:16;604:5;
611:21;617:16,19;
629:3,21;630:12;
653:4;657:5;659:21;
662:1;663:2;676:3;

677:7;683:24;
687:20;694:24;
704:7,11,20,23,25;
705:5,7,12,19,23;
707:14,18,20;708:1;
709:4,7;722:19;
724:20
standpoint (2)
644:20,23
start (23)
433:17;440:10;
452:12;471:2;472:6;
481:5;496:13,18;
517:14;521:6;
530:23;540:19;
546:7;615:18;616:6;
622:7;632:14;
639:25;640:7;
675:13;703:4;
705:14;729:10
started (24)
440:5;441:18;
444:24;445:3,4;
459:14;465:6;
469:16;470:6;472:2;
473:16;479:7;
496:24;519:5,16;
530:19;531:7;
532:25;533:1;
539:21;648:3;
662:15;699:16;
729:20
starting (8)
433:23;518:15;
522:13,20;540:17;
545:15;612:8;621:22
starts (2)
477:12;538:25
start-stop (2)
479:24,24
state (36)
565:17;675:25;
678:3,4,5,13,21;
679:14,15,23;680:6,
17;697:2;701:15,17;
702:3,6,12,23;
703:12,15,20,25;
704:9,13,20;705:6,
20;706:11;707:22;
708:11,25;709:22;
710:14;711:8,10
stated (4)
485:12;535:19;
562:23;691:13
statement (2)
509:7;693:22
states (1)
690:11
State's (3)
678:1;704:2;
711:13
station (11)
463:4;466:20;
467:3,15;516:12;
562:20;578:18;
616:12,14,15,24
stations (1)
659:1
statistical (1)
698:21
Statistically (1)
599:2
status (1)
529:25
stayed (2)
437:22;645:24
steady (1)
603:15
steel (1)
446:11
steep (1)
608:25
stemmed (1)
678:6
step (9)
499:24;504:6;
531:12,17;565:10,
16;567:22;604:23;
723:17
stepped (1)
538:24
stepping (2)
565:12;584:6
steps (6)
434:14;520:13;
681:16;713:9,10,24
Steve (10)
432:24;433:2,9;
434:13;435:22;
675:17;677:12;
712:8;732:25;733:3
stick (1)
519:24
sticking (1)
600:13
sticks (4)
465:8,14,17;
568:25
still (26)
438:7;443:11;
470:13;475:4;477:4;
493:3;499:12,16;
500:19;504:14;
508:10;511:2;
525:17;551:25;
566:17;571:4;578:1;
581:6;594:18;620:9,
22;621:18;636:21;
643:1;670:12;711:7
Stillwater (3)
697:12;699:5;
700:9
stone (4)
491:20;493:18,19;
512:25
stones (4)
488:2;489:2;
490:2;491:9
stop (11)
455:24;503:4,9;
558:20;604:12;
619:6,25;620:4,5;
621:10;655:3
stopped (1)
559:2
stopping (1)
655:6
stops (1)
710:6
storage (2)
450:21;528:7
stores (1)
710:9
storm/fog (1)
453:24
storms (3)
453:3,4;477:20
story (1)
678:25
straight (1)
458:16
straightforward (1)
627:12
strain (2)
451:4;551:3
strategy (1)
514:24
streamline (4)
494:13;580:18;
657:24;658:22
Street (1)
710:8
stress (3)
603:24;604:4;
682:16
stressing (1)
604:2
stretch (4)
477:22;627:17,19;
636:24
strictly (3)
527:20;625:5,6
strips (1)
504:8
strive (1)
705:10
strong (1)
682:4
structural (4)
482:5;527:18;
540:21;547:6
structure (2)
572:17;719:11
structured (1)
606:15
struggling (1)
534:15
stuck (1)
473:17
studies (2)
566:20;669:8
study (1)
657:13
stuff (6)
509:13;514:24;
527:15;606:23;
634:9;651:7
stumbled (1)
725:22
sub-areas (1)
613:11
subcontractor (1)
432:24
subject (1)
433:25
submit (2)
497:10;686:21
sub-sections (1)
496:13
subsequent (2)
620:25;651:7
subsets (1)
479:7
substantial (5)
541:17;547:20;
550:3;631:10;635:17
substantive (2)
551:9;612:14
subtle (1)
724:19
subtract (2)
441:19;452:4
subtracted (2)
721:14;724:7
subtracting (1)
460:7
succeed (1)
662:5
succeeding (1)
707:17
success (2)
564:21;679:3
successful (3)
525:2;548:4;
569:21
successfully (1)
526:7
suction (1)
686:14
suffered (1)
737:8
sufficiency (1)
629:2
sufficient (4)
441:11;488:10;
551:10;562:13
sufficiently (1)
692:25
suggest (3)
514:8;535:14;
615:23
suggested (4)
442:1;495:24;
681:16;690:18
suggesting (4)
579:19;630:9;
642:22;693:2
suggestion (1)
496:1
suggestions (1)
653:16
suggests (1)
609:14
summarize (2)
564:10;568:10
summarized (1)
453:14
summarizing (1)
704:1
Summary (7)
453:9,18;463:25;
479:17;707:7;737:5,
11
summer (3)
490:19;729:24;
731:17
Sunday (1)
472:9
Sundays (2)
443:21;452:4
Super (7)
433:13;445:8;
467:10;528:9;
531:24;587:25;
688:18
superimposed (1)
538:10
Supervisors (1)
687:7
supplemental (1)
528:7
supplementary (1)
726:21
supplied (1)
695:4
supplies (1)
688:6
supply (5)
610:22;616:10,23;
694:19,20
support (12)
435:18;533:21;
570:15;592:12;
614:19;630:2,8;
700:18;710:1;
711:17;737:21,23
supported (2)
533:19;618:12
suppose (2)
642:22;691:23
supposed (3)
503:9;544:20;
631:8
supposition (2)
666:19;672:10

sure (41)
432:21;434:23;
439:2;472:21;
477:19;483:23;
484:24;494:14;
496:4;497:2;501:13;
521:5;551:6;553:8,
25;554:5;560:6;
569:16,16;571:15;
574:20;576:7;
577:25;596:5;
609:12;622:7,9;
625:8;628:25;
629:19;635:25;
645:11;646:7;
647:13;657:20;
669:6;672:21;689:5;
718:4;722:12;736:16
surface (33)
503:11;513:14;
558:12,13;622:13,
24;631:13,23;
632:16;633:5,8,11;
634:9;639:8,16;
640:14;641:18;
643:25;644:5;
653:23;656:16;
665:15,16;692:15;
714:18,19;715:6;
717:8,9;722:2,4;
728:24;729:2
surfaces (2)
512:24;635:20
surgeons (1)
509:2
surgery (1)
509:1
surgical (9)
468:24;472:24;
473:4;508:22;
509:16,22;510:2,20;
599:20
surgical-type (1)
511:15
surprise (3)
567:5;569:5;
732:16
surprises (4)
491:15;514:2;
681:24,25
survey (6)
555:5;600:6;
608:10;716:24;
724:24;725:6
surveyed (2)
645:13,20
surveying (2)
542:24;597:17
surveys (3)
441:7;530:10;
656:11
sustain (1)
535:7
sweep (1)
645:16
sweeps (2)
645:17,24
switch (4)
436:24;495:9;
657:2;722:17
swung (1)
519:23
syntax (1)
688:4
synthesize (1)
685:19
system (25)
439:2;447:25;
451:20;461:21;
486:1,1;488:12;
500:5;518:4;523:9;
528:25;529:1;546:3;
562:4;579:21;
629:10;639:4;659:6;
678:2,2;700:23;
708:23;710:3,14;
711:13
systematic (1)
596:15
systems (3)
442:13;463:3;
724:15

T

table (5)
434:17;505:7;
614:18;653:17,19
tact (1)
532:16
tail (1)
446:23
tails (1)
600:16
talk (23)
435:2;438:10;
447:7,9;451:23;
466:8;470:19;
491:18;515:2;
518:11;532:5;
539:10;553:9;
554:19;562:24;
568:8;587:6;622:15;
632:17;640:17;
682:15;713:14;
725:19
talked (12)
453:10;495:12;
500:12;521:8;576:5;
589:15;597:7;649:1;
657:6;712:13,15;
733:15
talking (29)
487:9;495:15,18;
497:5;498:7;500:15;
505:2;509:1,12,13;
514:13;515:13;
537:22;541:6;559:6;
575:24;578:2;594:8;
598:3;608:3;609:25;
628:6,21;630:23;
640:8;650:20;
663:17;697:18;730:6
talks (1)
503:22
tanks (1)
459:5
tape (2)
612:21;653:24
tardy (1)
616:7
target (17)
438:20;440:4;
441:16;442:2,8;
443:15;463:13;
468:22;472:22;
539:5;551:13;
580:15;643:4,10;
667:2;690:13,16
targeted (11)
441:8;443:12;
464:18;470:23;
478:17;493:4;501:9;
522:24;536:13;
638:4,6
targeting (3)
518:22;601:1;
735:21
tarping (1)
558:25
tarps (1)
559:8
TD (1)
722:15
Team (6)
437:4;494:25;
495:1;532:13;705:9;
706:18
team's (2)
706:20,22
tease (1)
611:12
technical (2)
629:2;689:2
technique (1)
610:15
techniques (5)
648:15;658:13;
693:1;706:8,13
technologies (2)
577:2;651:1
technology (8)
473:3;565:24;
566:5,23;567:13,21;
650:22;686:8
telemetry (1)
721:15
telling (1)
629:23
tells (1)
559:9
ten (4)
594:2;635:23;
639:12;653:9
tend (1)
501:20
tendon (1)
584:11
tends (1)
592:12
tennis (1)
615:11
term (4)
473:13,16;586:4;
670:8
terms (39)
499:2;500:24;
505:13;525:24;
546:9;549:3,12;
555:19;556:8;
559:22;561:24;
576:15;595:3;605:7,
7;608:4;611:12;
622:21;623:15,21;
624:24;625:25;
626:5,21;636:4;
639:5;640:17,18;
652:1,11;658:3,4;
667:23;669:3;683:1;
684:1;701:6;715:25;
724:17
test (12)
439:1;486:22;
488:12;498:4;527:7;
577:3,4,4;591:15;
642:3,19,21
tested (2)
642:15;644:6
testing (3)
506:9;643:9;
681:18
tests (2)
470:3;572:13
Texas (1)
511:10
Thanks (8)
455:4;457:17;
481:7;530:17;
663:24;673:22;
675:18;732:23
theme (1)
563:18
theoretical (1)
553:20
Theoretically (5)
456:15;464:13;
553:8,13;554:5
theory (2)
714:21;715:10
thereafter (2)
678:9;735:1
thereby (1)
694:3
Therefore (1)
678:21
thick (1)
458:4
thickener (1)
459:5
thin (4)
577:15,16;716:15;
726:4
thinking (2)
582:23;627:23
thinner (2)
432:2;598:13
third (9)
548:11;573:12;
597:11,19;598:2;
599:4;672:19;
686:17;725:7
Thomas (1)
680:15
THOMPSON (46)
454:17;455:12,21;
456:6,11,17;506:25;
522:23;541:21;
542:17;549:16;
550:8;551:5,24;
562:16,18,19,21;
608:19;609:11;
610:16;615:16,24;
616:15,19,25;
620:10;629:5;
638:19;646:18,22;
650:7,15;666:13;
667:24;669:18;
699:2,22;700:16;
718:1,6;719:4,24;
720:5,16;722:17
though (8)
438:7;440:3;
471:10;499:15;
599:17;604:15;
624:9;725:24
thought (13)
471:25;489:4;
493:9;536:16;
549:21;610:18;
616:2;626:10;
638:14;641:4;642:6;
727:14,16
thoughtful (1)
738:11
thoughts (3)
494:9;651:25;
733:10
thousand (3)
441:19;537:23;
650:14
thousands (1)
637:8
three (41)
445:24;464:6;
465:20;468:13,23;

471:14,18;472:20, 23;473:5,6,8;474:3, 11,17;475:16;478:9; 480:9;484:23;496:2; 498:5;507:19,19,22; 526:17;529:7;549:6; 550:18;570:16; 572:8;578:10,25; 588:25;599:21; 608:10;613:11; 614:16;648:13; 665:25;666:2;670:14
three-dimensional (2)
728:24;729:2
three-month (1)
694:3
three-yard (1)
460:13
thresholds (1)
637:14
throughout (11)
437:23;480:4; 528:4;544:7;557:22; 600:20;637:9;657:5; 701:22;709:21;722:5
throw (1)
491:9
throwing (2)
488:2;489:2
thrown (1)
490:2
thrust (1)
485:23
Thursday (1)
472:10
Thus (2)
576:25;691:18
tight (2)
447:15;511:11
tighten (1)
510:22
Tim (14)
454:15;549:15; 550:7;554:12;606:2; 608:18;615:13; 620:8;622:2;638:15, 17;644:20;646:16; 713:4
timely (1)
695:2
times (15)
435:15;449:10; 452:14;461:2; 494:12;526:17; 544:8;557:3;571:21; 578:25;591:22; 603:24;643:20; 691:24;699:4
timing (1)
720:17
Tim's (1)
651:20
tiny (1)
599:24
tip (2)
448:13;665:13
tires (2)
446:8,10
tissue (1)
624:22
today (17)
432:3;433:16; 434:6,17;435:9; 438:11;500:21; 532:3;674:23; 677:14;680:25; 681:16;686:21; 733:24;735:20; 736:22;737:1
Todd (14)
495:8;502:23; 508:17;515:8; 529:13;530:16; 596:13;606:2; 615:13;617:1,25; 618:19;634:24; 663:25
together (12)
494:21;499:25; 500:6;505:1;570:16; 574:25;576:19,23; 643:6;713:8,12; 734:6
told (3)
455:24;604:11; 615:1
tolerance (3)
511:11;512:6; 599:22
tolerances (5)
474:4;480:7; 499:3;507:12;510:22
Tom (7)
675:3,6,13,19; 680:21;686:1,2
tomorrow (1)
736:23
tongue (1)
508:24
tons (3)
481:15;537:23; 702:9
took (24)
470:23;473:20; 478:14;504:4,9; 536:17;547:17; 554:21;555:23; 567:1;586:6;588:18; 589:21;590:1,17; 613:15;621:14; 646:2;648:3,22; 653:13;699:23; 713:6;714:17
tool (2)
507:11;509:2
top (9)
447:23;458:20; 503:20;505:17; 567:14;596:16; 636:23;643:25; 672:24
topic (1)
592:20
topics (1)
435:20
topping (2)
557:12,15
tops (2)
466:12;726:18
total (29)
438:23;441:12; 452:24;454:19,20, 25;456:4,6;461:1,5, 7;492:5;516:23; 537:13,16;544:18; 545:14;555:19; 596:17;653:10,24; 690:15;691:14; 693:6;714:4;715:13; 718:22,24;722:13
totally (3)
484:1;673:12; 693:25
touch (2)
551:15;558:23
touched (4)
494:12;556:7; 559:19;560:20
tough (4)
518:1;520:16; 608:7;729:1
tourism (1)
709:24
Toward (3)
496:23;501:21; 662:17
towards (7)
432:4;471:16; 477:20;533:24; 579:10;612:3;666:6
Town (3)
437:25;688:6,7
track (2)
516:21;675:17
tracking (3)
457:19;659:15,18
traffic (5)
516:12;517:5; 586:21;587:13;676:6
trailing (1)
540:2
trails (1)
738:13
trajectory (2)
626:11,13
transcript (1)
737:7
transfer (9)
444:19;462:21; 463:2,4;466:19; 467:3,15;471:15; 520:11
transferring (1)
588:6
transient (1)
558:7
transitory (1)
670:7
translate (1)
583:22
translates (1)
441:23
trans-load (3)
548:21;587:17; 588:3
transport (2)
528:5;590:9
transportation (5)
516:3;518:20; 588:2,10;679:16
transported (4)
446:18,19;691:15; 708:22
transporting (1)
517:8
transports (1)
637:8
trap (4)
632:18,20;635:3; 636:25
trash (1)
673:11
travel (1)
467:17
treated (1)
719:10
treating (1)
606:16
treatment (2)
528:24;688:10
tremendous (3)
493:10;567:18; 581:14
tremendously (1)
548:15
trend (2)
698:8,11
tri (2)
653:23;714:21
tried (13)
465:11;505:9; 506:4;531:24;534:3, 21;557:10;559:10; 572:6;627:5;648:14; 670:22;715:15
trillion (3)
562:5,8;573:5
trip (2)
467:1;730:23
tripling (1)
628:23
trivialize (3)
651:10;655:16; 659:20
trommel (10)
447:18;448:18,19; 449:8;450:24;459:1; 516:1;528:25;591:3; 599:12
trommels (3)
525:25;527:15,17
trowel (2)
448:15;526:16
Troy (1)
695:3
truck (1)
448:6
trucks (2)
450:20;711:6
true (5)
440:11;476:15; 489:17;513:23; 730:18
trustees (3)
675:22;676:7; 677:1
truth (1)
441:5
try (41)
458:19;468:21; 471:25;477:23; 498:14;500:21,22; 501:20,23;506:23; 511:18;513:8,18; 517:19;520:8,9; 522:11;527:24; 534:4,24;545:11; 547:1;573:8;575:17; 576:19;591:16; 612:12;618:18; 630:11,17,20; 631:18;634:14; 646:8;649:12;653:8; 657:12;669:2; 670:19;716:22;738:2
trying (36)
456:14;468:25; 470:19;486:6; 494:21;496:3; 498:11;505:1; 517:25;519:9,20; 520:1;556:10; 558:22;561:13; 570:17;571:25; 584:21;585:6,8; 600:3;601:24; 608:11;634:24; 651:10,22;655:16; 659:13,20;672:2; 682:21;683:3;684:4; 728:2,23;737:9
TSS (1)
635:11
tubes (1)
491:1

tug (6)
517:22,22;570:9,
14;584:7;668:21
tug-related (1)
549:4
tugs (5)
445:22,23,24,25;
668:19
tune (1)
477:24
tuned (1)
500:19
turn (8)
436:20;481:3;
492:2;519:15;
532:24;546:13;
564:3;677:11
turn-around (1)
727:7
turned (3)
716:8;717:6;730:8
turns (3)
492:25;698:4;
701:1
twelve-inch (1)
448:3
twenty-three-five (1)
550:2
twice (4)
445:16;534:10;
573:25;574:2
two (81)
439:14;440:1;
445:9;446:10;450:9;
458:13;465:20;
466:10;470:3;475:7;
478:14;480:19;
481:11,14;498:4;
500:1;502:25;
504:25;506:13;
507:6;511:18;
517:16;519:6,10;
520:8,9;523:12,21;
527:3;528:20;
538:14;540:14,15;
543:10;546:20;
548:17;560:22;
563:19;571:21;
578:21;580:22;
581:7;587:7;592:20;
597:8;599:6;608:15,
24;613:21;621:12,
17,18;625:7,23,25;
629:24;636:11;
639:8;640:13,25;
649:9;651:17;660:6;
674:2;688:4,9,17;
689:10;698:1,18;
705:24;707:10;
714:6;724:10,12;
730:18;731:1;
734:16;736:25;
737:8,14
two-and-a-half (1)
469:22
two-fold (1)
660:17
two-phase (1)
707:2
two-step (1)
723:21
type (7)
542:21;547:14;
598:15;647:20;
657:13;700:22;
724:17
types (4)
534:11;547:23;
556:3;648:15
typical (5)
470:17;645:14;
731:6,12;732:2
typically (8)
453:4;503:6;
505:6;589:1;591:1;
593:24;618:7;728:16
Tyson (2)
727:3,4

U

ultimate (1)
733:9
Ultimately (16)
438:1;451:2;
465:25;470:2;
531:14;533:6;534:5;
535:21;538:20;
557:9;562:14;
563:16;589:22;
605:21;613:2;725:22
unable (2)
679:24;689:5
unacceptable (1)
693:25
unambiguous (1)
727:23
unanticipated (1)
491:16
unavailable (1)
447:1
uncertain (3)
568:19;570:5;
649:15
uncertainties (5)
569:19,23;629:25;
652:9,11
uncertainty (22)
479:22;501:13,17;
514:9,15,23;515:6;
525:4;568:13;569:8,
10,14,25;575:4;
580:24;607:23;
628:20;649:2,3,13;
652:8,19
Under (6)
445:12;448:13;
464:20;519:13;
522:21;708:19
underestimated (1)
499:10
Underestimating (1)
468:10
underestimation (2)
440:7;447:12
underneath (2)
641:13;665:16
understandable (1)
598:1
understands (2)
656:9;708:11
understated (2)
468:5;678:24
undertaking (1)
685:24
underway (1)
594:18
un-dredged (2)
589:8;622:14
undulating (3)
503:10;512:23;
513:14
unexpected (1)
484:1
unfortunate (2)
584:14;665:24
Unfortunately (8)
467:18;566:14;
621:25;635:2;673:8,
9;689:3;711:4
uniform (1)
599:6
union (2)
678:5,13
unique (1)
589:7
unit (1)
606:22
units (2)
608:4;694:1
unknown (2)
569:14,17
unknowns (2)
568:17,20
unknown-unknown (1)
569:4
unless (4)
522:22;568:1;
615:8;642:3
Unlike (1)
507:13
unload (11)
447:3;450:19;
467:14;486:25;
519:10,11;520:9;
553:15;589:16,16;
590:7
unloaded (4)
447:21;451:6;
472:13;521:1
unloader (4)
490:15,20;520:24;
527:24
unloading (24)
447:17;449:21;
451:18,20;459:22;
463:13;464:25;
472:12;480:3;482:6;
488:8;516:1;520:2,
15,25;553:7;588:12,
13;589:17;590:12,
16,19,24,25
unnecessarily (1)
581:14
unnecessary (1)
681:23
unprecedented (3)
529:17;533:10;
710:20
unproductive (2)
555:13,23
unrealistic (1)
538:24
unstable (1)
467:25
unusual (1)
466:3
up (165)
432:4;434:17;
435:25;436:4,23;
437:20;438:1;
439:14;440:6,21,24;
441:20;443:16;
444:22;448:12,14;
449:9;451:5;452:22;
454:24;455:4;456:9;
457:9;458:15,16;
459:2,4;460:6,19;
461:8;462:12;464:7;
465:14,25;466:9,14,
21;469:9;471:17;
472:12;475:25;
476:22;478:23;
482:19;483:25;
485:5;486:1,9,9,18;
489:17;490:20;
495:10;496:20;
498:4;503:3;504:23;
508:8,9;511:6,19;
516:14;517:14,17,
21,23;518:2;520:5,
12;526:19;527:17;
529:17;531:5;
535:15;536:3,6;
539:6,22;540:17,19;
542:8;543:23,25;
545:1,21;546:7;
548:20;551:21;
555:21;556:20;
558:11;559:1;
560:10;561:24;
568:12;569:22;
571:7;572:15;
584:18;586:13;
587:20;591:12;
599:11;600:13;
601:23,24;602:10;
604:17,18;609:6;
611:5;614:10;
619:14,24;620:9,9,
16,18,19,22,23;
625:9;634:22;638:9;
647:17,19;648:7,8;
649:24;651:5;655:7;
656:22,24;657:1,2;
665:18;666:5;668:2,
19,21;674:1,13,16,
20,21;675:3,14,16;
683:11;686:19;
696:3;697:10;699:1,
5;712:18,22;716:4,4;
717:15,23;727:14;
728:9,10;737:9;
738:2
updated (1)
706:2
Updating (1)
580:10
upgraded (1)
580:4
upgrading (1)
522:5
upon (4)
494:23;558:23;
695:7;708:12
upper (3)
497:2;634:18;
683:13
upriver (2)
455:2;627:13
upshot (2)
450:6;466:23
upstate (1)
711:9
upstream (12)
437:10;506:17;
572:7,18;589:4,5;
609:8;667:25;
700:25;701:6;
728:17;729:4
upward (2)
448:10;690:9
usable (1)
452:17
use (29)
443:1;461:17,21,
23,24;462:7,9,11,14,
16;464:12;473:13,
14;482:22;483:3;
545:1;548:18;
552:22;559:8;561:5;
563:4;580:3;606:25;
612:11;643:20;
647:22;649:16;
667:21;670:23

used (32)
444:19;445:17;
446:2;449:17;
453:20;458:13;
463:21;471:3;
473:14;476:18;
487:4;517:21;
529:16;559:20;
575:23;576:7;586:4;
624:10;657:11;
658:13;677:8;
682:13,21;686:8,15;
694:9,12,14;698:1;
706:8,13;723:4
useful (2)
613:23;629:20
user (1)
688:24
uses (1)
715:15
using (12)
445:25;449:6;
471:10;473:16;
529:12;604:14;
692:25;695:5;
697:15;708:16;
719:13;723:23
usually (2)
468:13;568:23
Utah (1)
567:10
utility (1)
445:25
utilize (1)
680:13
utilized (3)
539:2;547:7;571:1
utmost (1)
688:1

V

vacuum (2)
551:8;686:14
valuable (1)
688:20
value (5)
538:4;549:12;
557:2;616:14;695:25
variabilities (2)
635:18;668:6
variability (8)
522:17;668:7,15;
698:5,10;700:22;
701:8;703:22
variable (3)
644:3;698:15;
699:20
varied (1)
731:19
variety (1)
639:17
various (6)
464:2;594:25;
601:6;638:4;642:12;
688:24
vast (1)
637:17
velocities (3)
454:7;548:13,14
velocity (4)
533:15;550:25;
672:6;673:4
veneer (2)
637:25;641:16
verification (2)
497:11;498:21
verify (1)
619:7
versa (1)
684:16
version (1)
713:25
versus (1)
649:7
vertically (2)
448:10,12
vessels (6)
530:13;533:20,21;
570:15;594:2;659:19
viable (1)
618:9
vice (2)
684:16;709:16
Victor (16)
502:24;508:18;
515:21;518:7;
522:11;525:12;
596:12;601:13;
617:2;622:1;626:17;
628:6;638:21;
643:13;646:13;657:1
Victor's (1)
432:10
view (11)
449:24;469:11;
490:5;510:24;
592:13;610:9,12;
665:8;671:14;
706:22;724:19
Village (1)
688:8
violations (1)
694:23
visible (1)
620:1
vision (1)
640:4
visit (1)
620:13
visual (2)
633:7;665:17
vitality (1)
678:23
VOC (1)
468:11
volume (23)
438:20,23;439:13;
440:14;441:13,23;
442:7,8;443:15;
451:8,16;507:21;
522:2,16;537:14;
538:6;540:8;547:8;
551:10;588:21;
589:20;598:4;604:18
volumes (6)
438:13;441:11;
535:14;538:18;
543:2;562:13
vortex (1)
450:16
vu (1)
683:23

W

wagged (1)
446:24
wait (5)
455:10;456:18;
467:12;474:17;
587:15
waiting (16)
456:23;464:1,6;
467:7;471:19;
472:13;516:7;
586:11,12;587:19;
592:19;593:12;
594:7,11;611:15;
646:18
wake (1)
729:16
walk (7)
470:15;613:22;
630:12,17;713:14,
23;724:22
wall (2)
447:24;516:14
walls (3)
446:10;466:11,13
wants (7)
614:6;615:8;
673:25;677:10;
692:3;695:19;717:22
washed (1)
469:19
waste (5)
480:20;498:6;
519:2;529:7;577:8
wasted (3)
496:8;682:11,13
watch (3)
496:18;594:1;
610:11
watched (1)
620:20
watching (1)
517:6
water (65)
437:9,14;450:11,
13,14,17,25;465:6;
466:16,20,22;
519:14,19;523:11,
19;528:2;533:14;
540:8;552:18,20;
556:16,19;557:11;
561:7,9;571:9;
576:13;579:21;
582:1;586:22;
589:12,20;590:2,4;
593:22;594:2,4;
598:14,14;615:22;
616:9,23;622:23;
623:16;631:11,12,
13;636:14;660:1;
666:12,18;678:17;
679:13;688:5,10;
691:6;693:3;694:19,
20,23;695:4;703:9,
14,16;720:13
Waterford (10)
578:18;631:2;
636:13;688:7,8;
689:20,22;690:17;
693:8;695:6
waterway (3)
679:5,8;710:16
way (54)
441:25;442:17;
445:11;450:5;
451:12;453:8;459:9;
464:17;470:9;471:3;
479:22;497:22;
498:24;511:9;
513:25;515:2,6;
531:12,17;548:22;
566:7;569:20;577:8;
579:5;580:19;
591:13;596:15;
606:15;608:15;
615:14;616:10;
623:8;630:18;633:2;
634:16,16;647:5;
649:14;650:3;
653:19;663:18;
664:7;670:7;674:15;
681:9;695:2,10;
706:16;714:18;
715:9;718:21;
722:21;727:13,18
Wayne (2)
696:20,24
ways (6)
521:2;605:21;
607:3;638:13;
699:17;719:10
wealth (1)
711:1
weather (2)
545:9;585:8
website (2)
736:24;737:2
week (26)
443:18;449:16;
451:8,10,18;452:2,
14;453:10,12;471:2;
472:2,5,7,17,18;
477:15,15,16;478:5;
496:2;512:20;522:6;
533:24;544:18,22;
735:22
weekend (1)
568:25
Weekly (3)
453:9;457:22;
463:24
weeks (4)
443:20;451:10;
526:13;737:14
weigh (2)
560:18;661:23
weight (1)
715:16
weighting (1)
718:10
Welcome (3)
432:1,3;504:25
well-defined (1)
500:2
well-loaded (1)
478:19
weren't (10)
432:16;439:19;
505:8;517:3;528:14,
16;534:6;537:3;
666:4;733:2
west (18)
438:4;454:5;
462:2;467:2;511:9;
548:7,12,22;549:2;
552:19;553:2,3;
555:22;572:12;
587:18;591:9;673:1;
729:5
wet (1)
458:7
whammy (1)
673:1
wharf (1)
589:17
what-have-you (1)
450:23
whatnot (4)
662:1;666:5;
672:18;737:12
what's (12)
511:20;569:12;
632:10,11,21;
641:24;653:25;
665:16;668:16;
669:22;685:5;732:7
whatsoever (1)
524:8
whenever (1)
583:6

whereby (2)
605:18;707:10
wherever (2)
432:4;516:15
whipping (1)
489:9
whole (9)
452:25;453:2;
461:5;486:1;492:8;
546:19;571:13;
577:25;606:17
whose (1)
509:2
wide (6)
445:2,6;513:7;
542:4;732:3,10
wider (1)
595:2
width (3)
609:9;639:10;
732:7
Wildlife (1)
697:1
willing (1)
556:2
window (1)
674:3
wiped (1)
596:10
wish (4)
508:3,4;664:3;
677:21
within (24)
435:20;436:2,10;
473:7;474:3;492:17;
515:4;534:16;
539:24;540:20;
549:6;563:14;607:7;
612:25;617:8;629:5,
10;633:3,6;662:13,
25;678:20;700:12;
710:3
Without (9)
551:1;576:9;
579:13;603:22;
629:3,22;679:7;
695:1;738:3
wonder (1)
638:11
wood (1)
447:6
word (5)
509:22;529:16;
549:20;655:20;733:9
wording (1)
514:7
words (1)
738:2
work (51)
432:9,14;437:4;
438:2;439:18;
442:17;445:13;
451:13;454:24;
460:21;483:10,14;
486:2;488:9;490:20;
499:24;510:22;
519:25;531:9,11;
533:17;537:1;
544:18,21;553:6;
570:20;576:23;
579:10;582:13;
591:18;593:6;
597:16;610:4;639:5;
646:3;648:6;684:2,6;
701:6;702:11,15,24;
703:2,14;704:7,19,
25;705:18;706:14;
713:1;738:8
workday (1)
454:20
worked (10)
452:2;494:20;
505:1;506:13;528:3;
534:9;545:15;
621:20;643:7;658:12
worker (2)
530:2;584:6
workers (1)
583:23
worker's (4)
529:20;583:11,13,
16
working (19)
451:25;462:25;
464:5;487:2;494:25;
500:5;504:24;
506:17;517:18;
533:3,18;584:17;
585:23;586:14;
588:5;589:1,5;
590:23;734:11
works (4)
472:1;526:9;
674:15,21
world (3)
583:24;685:14;
710:22
worth (2)
493:15;499:17
wrap (2)
532:25;696:2
wrap-up (2)
434:13;712:9
write (1)
511:10
writing (1)
696:22
written (9)
438:15;442:1;
485:16,17;489:18;
493:8;496:11;
677:11;727:14
wrong (4)
473:9;508:7;
584:9;695:17
wrote (6)
437:23;444:4;
472:25;485:22;
489:21;507:17
wwwhudsondredgingcom (1)
737:2
wwwhudsondredgingdatacom (1)
736:24

Y

Yacht (3)
437:21;469:11;
518:25
yard (17)
439:24;441:16;
460:4,10;461:22,23;
464:13;475:20;
476:11,12;486:19;
513:2,10,18;536:8;
660:6,6
yards (75)
437:18;438:18,21;
439:1,16,17;440:7,
17,20;441:10,14,18,
20,25;442:9,16;
443:3,6,7,11,14,16;
449:10,11,14,16,20;
450:2,7;451:7,10,17;
453:13;460:11,14,
15,25;461:9;464:8,
15,17,18;466:13,25;
467:12;469:8,9;
470:24;472:2;
475:20;478:15,24;
485:15;486:7,14;
490:4;525:5;527:5;
528:15;532:1;535:6;
536:16;537:14,15,
20;538:5,16;543:18;
549:25;550:3;552:5;
597:24;603:14;
635:22;662:11
year (52)
438:14,22,25;
439:7,7;441:25;
442:3,4,6,9,11,16,22,
22;443:4;484:12;
486:7;491:4,22;
492:6;493:2,3;522:7;
525:7;528:5;529:23;
531:21;537:3;
562:24;584:8;589:6,
23;622:17;626:21;
627:1;642:16;651:7;
672:18,19,20,23;
673:8;681:14;682:9;
686:10;698:5,5;
707:12;708:8,10;
721:20;727:1
yearly (1)
651:12
years (45)
433:14;438:3;
439:5,8;441:22;
442:10,17;443:3;
464:22;483:6;
485:22;490:12;
491:19,19,25;492:5,
18,24;493:5,12,17,
23;494:5;505:23;
533:5;535:8;568:11;
581:25;582:3,4;
624:16;626:11;
637:10,23;639:12;
643:6;651:8;687:10,
16;697:22;698:1,6,
18,23;708:9
year's (1)
625:21
yesterday (31)
432:17,19;433:3;
435:8;468:11;
493:16;500:12,20;
514:6;541:6;546:1;
547:6,15;548:8;
550:24;554:2;558:9;
575:25;579:7;
634:23;645:8;
647:10;653:17;
655:7;676:8;681:11;
693:23;713:6;733:2;
734:8;736:22
yesterday's (1)
693:20
York (22)
504:22;675:25;
677:21;678:1,2,4,11,
19;679:14,15,23;
680:6,17;697:2;
701:15;709:17,22;
710:14,24;711:10,
11,19

Z

Zebra (1)
686:11
zero (3)
596:11;720:12,13
zeroing (1)
440:10