

In The Matter Of:
Narragansett Bay Commission

Stakeholders' Meeting
October 23, 2014



VIDEO CONFERENCE CENTERS

Phone: 401-946-5500

Toll Free: 888-443-3767

www.alliedcourtreporters.com

info@alliedcourtreporters.com

Min-U-Script® with Word Index

1 STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
2 NARRAGANSETT BAY COMMISSION

7 PROCEEDINGS AT HEARING IN RE:
8 STAKEHOLDERS' MEETING :

13 DATE: OCTOBER 23, 2014
14 TIME: 9:00 A.M.
15 PLACE: NARRAGANSETT BAY COMMISSION
16 ONE SERVICE ROAD
17 PROVIDENCE, RHODE ISLAND

18 BEFORE:
19 MICHAEL DOMENICA, MODERATOR

1 While we're waiting for that, we'll get
2 started for the agenda. Again, Tom, you have
3 some comments to make for the start.
4 MR. BRUECKNER: Two things, I just want
5 to remind people that when they speak to state
6 their name and also to speak slowly.
7 (INTERRUPTION BY THE COURT REPORTER)
8 MR. BRUECKNER: My name is Tom
9 Brueckner, B-R-U-E-C-K-N-E-R. So there's fair
10 warning. I just have one parking lot issue from
11 the last meeting. There was some discussion
12 about secondary treatment being required for
13 satellite treatment facilities. I've had some
14 further discussion about this requirement with
15 EPA since then, and I would like to provide some
16 clarification on this issue.
17 Screening and disinfection is still an
18 alternative that is being considered. At this
19 point, secondary treatment is not required for
20 satellite treatment facilities. As was
21 discussed, these facilities could be installed
22 with only screening and disinfection, but
23 discharge permit would be required. The permit
24 would contain limits necessary for the effluent
25 to meet water quality standards, including

1 (MEETING COMMENCED AT 9:00 A.M.)
2 MR. DOMENICA: I need to tell you all
3 where the restrooms are. If you haven't found
4 them yet, right out the door here is the men's
5 room. I think the ladies' room is out there,
6 too. Very good.
7 Secondly, the exits, one is through the back
8 door there out the front, and if you go out to
9 the hallway and take a right, there's an exit to
10 the back of the building, as well.
11 Also, we have -- we're welcoming a new
12 stenographer today, Denise, and I think she's
13 ready to go.
14 UNIDENTIFIED SPEAKER: Trial by fire.
15 MR. DOMENICA: Trial by fire is right.
16 I'm trying to speak up a little louder, and I
17 think we all need to do that for Denise's sake.
18 And, also, be very sure to state your name when
19 you make a comment right upfront. That will be
20 very helpful.
21 Tom also reminded everybody to sign in.
22 There's a sign-up sheet there, and it looks like
23 everybody has their name tags. There's an
24 agenda. Anybody not have an agenda for today?
25 There's some at the table there.

1 narrative limits where numeric limits cannot be
2 developed.
3 To date, authorities have focused primarily
4 on bacteria and residual chlorine for those
5 permits. The permits would be issued by DEM.
6 Providing only screening and disinfection would
7 be an interim solution unless water quality
8 standards were met. If not, the Clean Water Act
9 requirement to eliminate the discharge or provide
10 secondary treatment would need to be met in the
11 future when it was affordable.
12 If the storage near service or tunnel and
13 treatment alternative was implemented, the Clean
14 Water Act requirements would be met for the
15 design storm. As stated previously by EPA,
16 further expenditures would be required when
17 affordable to address CSO discharging occurring
18 for storms greater than a design storm.
19 So I just wanted to mention that we could do
20 the satellite treatment as an interim solution,
21 as was discussed. Secondary treatment would not
22 be required right away, which I think was
23 mentioned in the minutes and I just wanted to
24 clarify that point. Thank you.
25 MR. DOMENICA: With that, there are no

Page 5

1 other parking lot issues, so I will give it to
 2 Rich Raiche to lead the meeting.
 3 MR. RAICHE: Good morning. I am Rich
 4 Raiche from MWH, the project manager for the MWH
 5 par team, the engineering, and other discipline
 6 consultants for our Phase III reevaluation.
 7 Today, we've got a two-part presentation, one
 8 before the break; one after the break. As usual,
 9 we'll start off with the review of where we are
 10 in the state called a process, and then Greg will
 11 present on the affordability analysis, something
 12 I'm sure everyone is very interested to hear
 13 about. We will then take a break and come back
 14 and conclude the alternatives analysis that we
 15 began last month, starting off with getting into
 16 the detail of the costs that we didn't present
 17 last month, and then concluding the alternative
 18 analysis process, and then some discussion of our
 19 next steps in what to anticipate for the
 20 November meeting.
 21 So we've been at this for a while. We
 22 kicked off the stakeholder process in February,
 23 and then in April and May we went through the
 24 exercise of defining the alternative, to working
 25 with you to determine what these CSO alternatives

Page 6

1 look like in each one of the locations. Then in
 2 June we discussed evaluation criteria, things
 3 beyond cost that we can use to determine which is
 4 the best solution for each one of the
 5 sub-systems. And then on September 4th, it seems
 6 like it's -- it was just yesterday, but I guess
 7 it was a month and a half ago, we started the
 8 alternatives analysis.
 9 Today we will conclude that with the
 10 affordability and costs and move to plan
 11 finalization in November. So with that, I will
 12 hand it over to Greg to discuss the
 13 affordability.
 14 MR. BAIRD: My name is Greg Baird with
 15 MWH, and I'm here with my colleague, Jon
 16 Albertsen. If we remember from the stakeholder
 17 meetings that we had at the very beginning, and
 18 we started talking about a little bit of the
 19 range of options and the potential dollar
 20 amounts. I believe even before we even started
 21 saying anything about the affordability and the
 22 process that we were going through, about 26
 23 times we heard affordability was really key and
 24 critical in this process.
 25 So just kind of starting everybody out, we

Page 7

1 have thoroughly gone through NBC's financial
 2 plans and their sources, retail revenues, their
 3 debt, fund balance, and all of their uses,
 4 operations of maintenance cost, capital projects,
 5 debt service, reserves and targets, and all of
 6 these things have kind of been formulated into a
 7 long-term financial model for us to be able to
 8 then start looking at some of the affordability
 9 analysis.
 10 When we look at some of the key financial
 11 plan assumptions, they are conservative. We are
 12 looking at 0 percent growth in the future years,
 13 we are counting all of the revenues, septage and
 14 late charges also. For debt proceeds, we're
 15 assuming that they are going to be using the
 16 Rhode Island Clean Water Financing Authority
 17 loans. And then what that's not going to cover,
 18 then they'll be going into the bond municipal
 19 market.
 20 We've escalated operations of maintenance
 21 cost at 2.3 percent, and we're assuming 20 years
 22 as far as any loan program or municipal debt
 23 issuance. And we've embedded the various costs
 24 and we've added a component, because when you're
 25 looking at the size of NBC and the liability

Page 8

1 associated with a lot of their different assets,
 2 we have a conservative estimate on some of the
 3 buildup of reserves to get to kind of the
 4 industry standard of about 90 days of operations
 5 and maintenance.
 6 When we look at the capital plan and
 7 projects, we have some major different
 8 categories. We have the waste water treatment
 9 facility improvements that total just under
 10 75 million over the 2015 to 2026 12-year period.
 11 We have the category of projects of
 12 infrastructure management that has a muriate of
 13 different uses. The next category is the sewer
 14 improvement and interceptor repair. And over
 15 that time period at a little bit more than
 16 40 million, we have the first or the last
 17 component of the CSO Phase II for just about
 18 50 million, and then you can kind of see how
 19 Phase III actually kind of rolls out during that
 20 12-year period for an estimated amount in today's
 21 dollars \$740,730,396. So we're really talking
 22 about a 12-year long-term capital program that
 23 totals \$915.8 million.
 24 MR. BISHOP: Brian Bishop, OSTPA. I'm
 25 just wondering, I thought we were working on

Page 9

1 Phase III, so this is just an assumed cost?
 2 MR. RAICHE: Those are the -- Rich
 3 Raiche, MWH. What we plugged into the
 4 affordability analysis are the baseline costs.
 5 So this is what the Phase III, as currently
 6 defined, the tunnel and sewer separation and
 7 interceptors.
 8 The escalation that you see there, the 740
 9 versus the 600, these are actually in 2018
 10 dollars. That's why it's a slight difference
 11 from what you've seen before.
 12 MR. BISHOP: So the baseline was
 13 established then essentially on a kind of tabled
 14 consideration of a third phase from the -- almost
 15 from the first stakeholders?
 16 MR. BRUECKNER: Tom Brueckner. Brian,
 17 that's what was in the CDRA. That was the
 18 proposed program.
 19 MR. BISHOP: Okay. Sorry. I just
 20 wanted to have that straight. Thank you.
 21 MR. REITSMA: Jan Reitsma, Governor's
 22 Office. R-E-I-T-S-M-A, first name J-A-N. So
 23 these are costs only for Phase III or for the
 24 overall operations?
 25 MR. BAIRD: This is all in. So the

Page 10

1 last category, the 740 --
 2 MR. REITSMA: I can't read it. Sorry.
 3 UNIDENTIFIED SPEAKER: Me either.
 4 MR. BAIRD: This is only the capital
 5 plan. This is just the capital plan --
 6 MR. REITSMA: Meaning for NBC?
 7 MR. BAIRD: For NBC.
 8 MR. REITSMA: In that case, I have a
 9 follow-up question. So in your projections, are
 10 you, for example -- this is a question I think I
 11 may have asked earlier -- including -- well,
 12 first of all, is there a vulnerability assessment
 13 for your facilities relating to sea level rise,
 14 storm surge, et cetera, which presents additional
 15 capital expenses or is that already incorporated?
 16 MR. BAIRD: My understanding is that
 17 this is what work they would need to be doing, so
 18 it wouldn't have any heavy duty climate change
 19 adjustments for anything along those lines. So
 20 if you pulled out any of the Phase III costs, we
 21 would be left with the things that NBC would need
 22 to do just on a regular basis that would add up
 23 to about \$175 million.
 24 MR. REITSMA: Thank you.
 25 MR. GADON: Harold Gadon, G-A-D-O-N.

Page 11

1 Did you answer Brian's question? This is
 2 strictly for Phase III, these figures?
 3 MR. BISHOP: It would be the last white
 4 column.
 5 MR. GADON: So 40 million.
 6 MR. BAIRD: This represents
 7 \$915.8 million, and 81 percent of that is the
 8 Phase III costs of 740 million, and the other 175
 9 is just everything else that they're going to
 10 need to do. Any other good questions on the
 11 capital plan? Because this is really what starts
 12 driving the debt service and the rate increases.
 13 This is really kind of where everything is at.
 14 When we --
 15 MR. DOMINICA: Mike Dominica. If you
 16 go out to 2026, which is 12 years --
 17 MR. BAIRD: Correct.
 18 MR. DOMINICA: -- maybe you explained
 19 that already, if you're looking at a 20-year
 20 planning period or a 20-year financing period?
 21 MR. BAIRD: The financial model
 22 obviously goes out beyond the 12 years, but we're
 23 really just trying to catch the snapshot of what
 24 Phase III, under the current requirements, how
 25 that would actually kind of play out.

Page 12

1 MR. RAICHE: Just a point of
 2 clarification. The exercise we went through for
 3 Phase III was to look at the consent agreement
 4 and determine what the schedule of reviews for
 5 preliminary design, final design would be, which
 6 then will give us a start date for construction.
 7 Then we looked at what that construction actually
 8 entails with the baseline being tunnels, drop
 9 shafts, sewer separation, interceptors, and
 10 determined what an aggressive construction
 11 schedule would be.
 12 I mean, it takes a certain amount of time to
 13 dig a tunnel and a certain amount of time to put
 14 in an interceptor. So this is essentially
 15 putting in the review period for kick off
 16 construction and then an aggressive construction
 17 cycle. This would be the fastest we could
 18 conceive of physically building Phase III.
 19 MS. KARP: Caroline Karp, K-A-R-P. The
 20 plan you gave us originally did say 605 million.
 21 What accounts for basically almost 25 percent
 22 increase, 20 percent increase?
 23 MR. RAICHE: We did go through the
 24 exercise of re-base-lining costs and calibrating
 25 all the costs against everything that is Phases I

1 and II. The major difference here is that we had
2 escalated all of the costs to 2018 dollars. The
3 \$602 million were stated in 2010 dollars. So the
4 large part of that was first escalating that 2010
5 estimate to 2014 based on E and R records, which
6 are a little bit higher than national averages,
7 and then doing an additional 3 percent escalation
8 to get it to 2018.

9 MR. RHODES: Jared Rhodes, Statewide
10 Planning. Would I be correct in assuming the 740
11 does not include the debt service cost or does
12 it?

13 MR. BAIRD: We will get to that.
14 There's -- really this capital plan will be using
15 PAYGO and state revolving funds and municipal
16 debt to be able to capture all of this. So this
17 is kind of another representation of how that
18 actually plays out. We can see where it ramps up
19 and then kind of spikes up at the heighth of the
20 construction period in 2021 and 2022, and then it
21 kind of drops back down as Phase III is
22 completed.

23 If we had stripped away, say, the first
24 three years that have some number of waste water
25 treatment facility, Phase II and Phase III, then

1 have on hand and then going after the state
2 revolving funds and then issuing municipal debt
3 on top of that.

4 MR. BISHOP: Brian Bishop, OSTPA. Do
5 you have that represented in any compounded
6 sense? I mean, I can add it kind of quickly.

7 MR. BAIRD: Like about an 84 percent --

8 MR. BISHOP: By the time you get to the
9 end.

10 MR. BAIRD: -- increase. Yeah.

11 MR. BISHOP: Okay. Thank you.

12 MR. BAIRD: You must be glancing in at
13 my notes. So that's where -- you know, about an
14 84 percent over the 12-year period with the
15 heighth of that at the 12.4 and the 12.8 percent.

16 Any other questions on this slide? Now --

17 MR. BISHOP: If we cut seven stars,
18 could we cut down those peaks?

19 MR. BAIRD: Yeah. If this was kind of
20 a treadmill or a bicycle exercise, that might
21 kind of wear you out a little bit. But smoothing
22 is always a good thing.

23 A couple of other findings that we had, and
24 my colleague, Jon Albertsen, if he wants to jump
25 in on this, some of the historical average annual

1 we would probably be looking at about an average
2 5.5 to \$6 million a year of capital projects.
3 Here's another interesting graphic. When
4 you think about it, obviously, NBC isn't doing
5 just capital projects, but they have the
6 operations of maintenance expenses. You can see
7 that the red bar is their existing debt service,
8 and then when you see the green, you can really
9 see what the assumption is of how they're
10 increasing their debt. And the red, the existing
11 debt, you know, tapers off just a little bit, but
12 nonetheless for -- to be able to issue additional
13 debt, you're almost issuing a little bit more
14 than double, than what their existing debt
15 capacity is. Then you can see the purple on top
16 being the capital projects.

17 When I look at rate increases, and a lot of
18 municipalities that might be able to smooth their
19 rates over a period of time, drawing on different
20 reserves, obviously, NBC needs to go through rate
21 cases with the PUC. So this is a representation
22 of the various rate increases on an annual basis
23 on rate cases that would need to be made
24 necessary to be able to provide a mix of funding,
25 once again, looking at any of the cash that they

1 charge was based on 200 gallons per day, and you
2 can -- and so we analyzed both. But when we were
3 starting to kind of look at what was really
4 happening, it seems like we're really at about
5 150 gallons per day. And this represents kind of
6 a fixed cost component, and then the volumetric
7 and consumption side of the fees and revenues
8 coming in. This is about a 35 to -- by the end
9 of the 12-year period of about a 45 mix of those
10 two, and then it's representing the 84 percent
11 increase over the 12-year period.

12 Now, going into this next area, and, Jon,
13 I'm going to have you come over here, for the EPA
14 guidance, when we look at the 1997 document that
15 is the original guidance to be able to calculate
16 the financial capability assessment, not only do
17 we follow that premise, but we realize that
18 there's some other types of things that that
19 didn't necessarily address that we wanted to take
20 care of for this affordability analysis. And
21 when -- so when we start talking about measuring
22 affordability, we really need to start shifting
23 our minds now and bringing in some other
24 terminology. It's just not population and number
25 of accounts or the EPA 1997 methodology had

1 nothing to do with people's actual bills. It
 2 kind of just said, the entire area, you know,
 3 what was the focus. There was no consideration
 4 for taking into account income distribution. And
 5 there's always that issue as far as, you know,
 6 what medium household income, what year are you
 7 going to use on the whole concept of just a
 8 medium?
 9 So when we start thinking of the new
 10 analysis that we're able to do, now we're talking
 11 households, now we're drawing in actual bills.
 12 We're drawing, you know, those actual bills and
 13 applying to the actual households at the census
 14 track level. We're also taking into
 15 consideration the 16 different buckets of income
 16 distribution that actually occurs, and then we're
 17 following EPA guidance on, you know, taking some
 18 medium household income and adjusting it to
 19 current 2014.
 20 By the time you do all of this, you're
 21 actually doing a weighted average, and you end up
 22 with different percentages, as you know, but then
 23 for our graphs and illustrations, we're
 24 benchmarking it back and calibrating it back to a
 25 2 percent index, and then color coding that so

1 So the Phase II indicators, the financial
 2 economic indicators, these are the rankings that
 3 we go through. Just to give some specifics of
 4 what we're actually going through, the first is
 5 looking at bond rating and figuring out if it's
 6 strong, mid range, or weak. We look at net debt
 7 and property value, unemployment rate compared to
 8 national unemployment rate, median household
 9 income compared to the national MHI, property tax
 10 and property value, and then the property tax
 11 collection rate.
 12 So in terms of the assumptions -- yes. Go
 13 ahead.
 14 MR. BISHOP: I'm sorry. Brian Bishop.
 15 Just so I understand the economic indicators,
 16 essentially what that rubric seems to indicate is
 17 that whatever the percentage of the median salary
 18 that these bills represent, if the economy is
 19 perceived as weak, that increases the perceptual
 20 burden despite the fact that it is really only
 21 the same percentage, that certain percentage of
 22 median household income.
 23 MR. ALBERTSEN: Correct. And, again,
 24 this is the baseline that's come up as a
 25 measurement by EPA in '97 and is what we're

1 everything looks very consistent.
 2 So with that, I'm going to turn a little bit
 3 over to Jon.
 4 MR. ALBERTSEN: My name is Jon
 5 Albertsen. I'm with MWH, as well. I'm going to
 6 walk through just the nuts and bolts of the EPA
 7 calculation as outlined in the 1997
 8 documentation. So with that, there are two
 9 indicators that we go through. The first is
 10 Phase I, which looks at the residential impact to
 11 the people in the community.
 12 What we do is essentially figure out a cost
 13 per household and divide it by the median
 14 household income. If it's less than 1 percent,
 15 it's low burden; if it's between one and two,
 16 then it's mid range; if it's greater than two
 17 then it's a high burden.
 18 Then alongside is the Phase II, the economic
 19 indicators or financial capability indicators.
 20 Essentially, we take six different metrics and we
 21 weigh and figure out, Okay, where does the
 22 utility rank? Is it weak? Is it mid range? Is
 23 it strong? When we rank those two, we score them
 24 both. Is it low burden or medium burden or high
 25 burden.

1 following.
 2 So in terms of key assumptions, everything
 3 is similar to what Greg just went over when
 4 talking about the financial plan, except for
 5 we're having to bring some things into today's
 6 dollars because we're comparing it to median
 7 household income that's in today's dollars. So
 8 what we do for the Phase I residential indicator
 9 is to get a snapshot of, Okay, what's the cost
 10 per household for everything today and compare
 11 that with the median household income today.
 12 So current O and M in terms of 2014, we have
 13 41 million. That doesn't include costs that are
 14 in the collection system or infrastructure in the
 15 communities or storm water costs. That's just
 16 cost for NBC. Annual capital of 45 million,
 17 which includes 42 million of debt service, along
 18 with capital expenses that we're saying pay in
 19 cash, these capital outlays of 3 million each
 20 year. And then we have future CIP, which
 21 includes the Phase III, which I know we looked at
 22 740 million before, but when we bring that back
 23 to today's numbers and look at that, that comes
 24 to about 678 million of Phase III costs. So I
 25 know we've been talking about a lot of different

1 time periods with the Phase III costs, but now
 2 we're talking about today's dollars with the
 3 Phase III costs.
 4 We have 153 million of waste water treatment
 5 improvements and non -- items associated with the
 6 CSO Phase III, and 500,000 of annual
 7 infrastructure management costs here at NBC.
 8 In terms of future O and M, what we're
 9 talking about here is additional O and M that's
 10 going to result after we finish construction in
 11 Phase III. When we look at funding and how we're
 12 actually going to pay for these things, we're
 13 going to aim to maximize the state loans as much
 14 as we can. When we ran it through the model,
 15 that's 51 revenue bonds, 26 percent of the Rhode
 16 Island Clean Water Financial Authority loans, and
 17 22 percent cash.
 18 In terms of the actual rates that we're
 19 assuming for this model, it's 3 percent for the
 20 state loans at 20 years, and for the revenue,
 21 5 percent at 20 years.
 22 So part of figuring out this cost per
 23 household is we have to figure out, Okay, what is
 24 the residential portion of the total costs. So
 25 use billing data, here at NBC, we figured out

1 want to know, how many additional households are
 2 being included if the service area gets expanded?
 3 MR. RAICHE: There is no extension of
 4 service area. This is the NBC service district,
 5 total number of households. The only way to
 6 expand the district would be to bring in other
 7 towns or expand its presence in other portions of
 8 towns.
 9 MR. BISHOP: We're reasonably built out
 10 in the service area.
 11 MR. ALBERTSON: So to look at some of
 12 these numbers and what they actually come through
 13 as -- and, again, there are actual worksheets
 14 that EPA has outlined that we can go through and
 15 follow. And this is kind of a high-level version
 16 of those worksheets. So we have just over
 17 86 million of current costs, and then we have the
 18 67 million of projected costs. Let me be clear
 19 that this 67 million that you're looking at is
 20 the mix of funding assumptions that we talked
 21 about on the prior tab. So it's looking at the
 22 total construction, CIP that we have to do, and
 23 using the revenue funding, using the state
 24 funding, and using the cash funding to get us the
 25 total cash outlay of the 67 million on looking at

1 that 61 percent of the total flows are used by
 2 the residential users. The residential share of
 3 the total cost is 61 percent. And then when we
 4 look at the number of dwelling units and the
 5 people that are being served, we have 118,638.
 6 MS. KARP: Caroline Karp, K-A-R-P.
 7 Could you go back one? The number of households,
 8 is that the number that's currently served or the
 9 number --
 10 MR. ALBERTSON: Currently served.
 11 We're bringing everything to today's dollars and
 12 comparing it to MHI today to figure out what's
 13 the cost per household right now.
 14 MS. KARP: So let me clarify that now.
 15 So assuming that the full Phase III gets built
 16 out, which I think is a question (inaudible),
 17 would additional households be included in that
 18 service area?
 19 MR. ALBERTSON: Potentially. But just
 20 in this analysis --
 21 MR. RAICHE: It's also service area
 22 wide.
 23 MS. KARP: It is service area wide.
 24 But it seems as though there's an extension of
 25 service area going on in Phase III, so I just

1 just an annual payment basis, this is all
 2 happening at one time, to get us 153 million of
 3 total costs.
 4 So when we take that amount and we take that
 5 by the 61 percent that we said was the
 6 residential share of those costs, we get the
 7 97 million. Divide that by the 118,000
 8 households to get \$789.95 as a cost per
 9 household. So that's the coast per household to
 10 do what we're currently looking at as a baseline
 11 Phase III cost.
 12 Then we look at, Okay, what is the weighted
 13 and adjusted median household income. Now,
 14 included in this number is the median household
 15 incomes of all of the communities that are served
 16 by NBC. Then they are weighted by the number of
 17 people that are served within each of those
 18 communities, so that we can accurately represent,
 19 Okay, what is the weighted MHI. Then we bring it
 20 again to today's dollars, because the source data
 21 was from 2012, bring that to 2014 dollars, to get
 22 us the 47,165. We divide the 789 by the 47,000,
 23 and we get 1.67, which brings NBC to a median
 24 burden. This is just including the costs that
 25 are paid by NBC for their services. Is there a

1 question?
 2 MR. GARRETT: Greg Garrett. So that
 3 residential indicator says that essentially the
 4 rates will need to go up 1.67 percent each year?
 5 Is that -- that's not what that is?
 6 MR. ALBERTSON: This is just a way to
 7 measure affordability that was outlined by EPA
 8 quite a long time ago. Essentially, what we're
 9 saying is where we rank in terms of how
 10 affordable or unaffordable it is. If it's
 11 between one and two, that's a median burden. If
 12 it's greater than 2 percent, then it's a very
 13 high burden.
 14 MR. BISHOP: I wanted to let you
 15 finish. Sorry. Brian Bishop. So can we loosely
 16 interpret -- I'm trying to figure how we loosely
 17 interpret the \$789 figure. Is that loosely
 18 interpreted as the total cost per sewerage per
 19 household per year in this model?
 20 MR. ALBERTSON: Correct.
 21 MR. BISHOP: And that includes
 22 previous -- I mean, if I'm reading the top
 23 correctly -- and this is theoretically by the end
 24 of the model?
 25 MR. ALBERTSON: It's essentially if

1 that, a three-family dwelling, it would be \$789
 2 per dwelling unit?
 3 MR. ALBERTSON: Correct. Per
 4 household.
 5 MS. PARTRIDGE: So the actual landlord
 6 would be paying almost \$2,000? Is this a year?
 7 MR. ALBERTSON: Correct. And, again,
 8 this isn't just saying this is exactly what your
 9 bill is going to be. In fact, Ray is going to
 10 get into a little bit more of our analysis of
 11 when we look at bills of people and we do look at
 12 community data. But this is what EPA prescribed.
 13 Okay, give us a measurement of what your
 14 affordability is and look at it from a very high
 15 level.
 16 MR. BISHOP: Brian Bishop. Just to be
 17 relatively precise on that, because I think the
 18 question was perceptive, it came from Central
 19 Falls, are these census households? Because NBC
 20 does not send a bill to each resident in a
 21 three-family, so you're taking census households?
 22 MR. ALBERTSON: So NBC, in their
 23 billing data, actually tracks the number of units
 24 that are in --
 25 MR. BISHOP: Okay. Got it. So you're

1 everything happened today right now and we just
 2 incurred all of the costs --
 3 MR. BISHOP: Okay. So if you were able
 4 to do this --
 5 MR. ANDERSON: Right now if everything
 6 was just done, it's attempting to get a snapshot
 7 of, Okay, everything right now of the --
 8 MR. BISHOP: So the imputed project
 9 costs were changed to -- it's a modest point at
 10 3 percent a year.
 11 MR. ALBERTSON: That's a good point to
 12 keep in mind, too, is that there's no
 13 consideration for what people actually use, what
 14 people are actually being billed, because there's
 15 volume base costs. So this is just taking one
 16 number for the whole community and dividing it by
 17 the number of people that are served to get
 18 essentially some sort of measurement. So moving
 19 along --
 20 MS. PARTRIDGE: Elaine Partridge, City
 21 of Central Falls. So I'm trying to understand
 22 this. The cost per household, that's just the
 23 cost for this thing, that's not actual usage?
 24 MR. ALBERTSON: Correct.
 25 MS. PARTRIDGE: The other thing is

1 using unit numbers tracking.
 2 MR. ANDERSON: Correct.
 3 MR. REITSMA: Okay. Just want to be
 4 very precise. Thank you.
 5 MR. ALBERTSON: Yup. So then we look
 6 at the Phase II indicators, and we look at, Okay,
 7 where do we rank? So in terms of bond rating,
 8 strong. When we look at net debt to property
 9 value, it's another indicator that NBC looked
 10 very strong. We look at unemployment rate in
 11 this area compared to the national rate, and it
 12 was actually 1.9 percent higher, so it was
 13 somewhat weak. We look at MHI. It was
 14 14 percent lower than the national, so that's a
 15 mid range score for that financial indicator.
 16 When we look at property tax to value, market
 17 value, we have a mid range score. And property
 18 tax to collection rate, it's in the mid range, as
 19 well.
 20 So then when you score all of those
 21 different things, the end result comes that, for
 22 the Phase II indicators, we are also in the
 23 midrange area.
 24 MR. BISHOP: This I don't think is a
 25 criticism of your work at all, because you didn't

1 make up the algorithm. What I don't see in the
 2 strength and weakness is any factor that
 3 otherwise then indirectly relates to the actual
 4 cost of living. Because the fact that our MHI is
 5 14 percent lower may not seem significant to
 6 North Carolina or somewhere, but the cost of
 7 living is so much less there that I don't think
 8 you could possibly consider our median household
 9 income as placing us mid range. Just
 10 instinctively I think there's something wrong
 11 with this.

12 MR. ALBERTSON: I completely agree.
 13 And I will say that spoiler Greg is going to get
 14 into a lot of these types of things. This really
 15 is a good indication of affordability.

16 MR. HOLMES: Phillip Holmes, Rhode
 17 Island Shell Fishing Association. If you take
 18 into account that when things cost more people
 19 use less of it, if you're basing your numbers on
 20 usage and the landlord of the three tenant
 21 apartments goes to his tenant and says that the
 22 more water you use, the more your bill is going
 23 to be, people begin using less water. And the
 24 smart ones that use less water, the bills goes
 25 down. But when their bills go down, everybody

1 household.
 2 MR. ALBERTSON: Sure. Sure.
 3 MS. KARP: Caroline Karp. I just
 4 actually want to come at this from a different
 5 angle, which is to say, this is the best
 6 available algorithm to decide things about
 7 affordability. At least the way you're
 8 explaining it, this is the version that's been
 9 adopted by EPA at the moment, so I understand
 10 these data as saying this project looks
 11 affordable, but I am not clear that it answers
 12 the underlying question about whether or not
 13 building a tunnel is desirable.

14 Now, I missed a couple of meetings, so it's
 15 my fault here. But it looks to me like the data
 16 suggests affordable but doesn't address the
 17 underlying issue. It doesn't address storm water
 18 controls, because there's no way to finance this
 19 without going back to the rate fees.

20 MR. ALBERTSON: Sure. All I'm going to
 21 say is I think I'm going to pass this to Greg
 22 right now, because all of these questions are
 23 leading to what we want to talk about in the
 24 remainder of this presentation. So I will toss
 25 it back to Greg.

1 else's goes up. So what happens in the end is
 2 everybody smartness up and uses less water, and
 3 then NBC has to adjust the rates to get their
 4 revenue back up. So by saving water, unless
 5 you're the smart one and nobody else does it,
 6 everybody else is going to pay more. I mean,
 7 there's a dog chasing its tail thing going on
 8 here sometimes with conservation.

9 MR. ALBERTSON: I can answer that
 10 question. Just real quick, so when you looked at
 11 the rate increases, the financial model you
 12 viewed, you considered less is (inaudible)
 13 demand, and so that is something we definitely
 14 considered.

15 MR. BISHOP: Brian Bishop. I just
 16 wanted -- I'm glad that Phillip used this as a
 17 bit of an ambiguous difficulty to sort out,
 18 because one of the problems is that the cost of
 19 CSOs is almost virtually unrelated to the level
 20 of consumption, so that said people using less
 21 water at home is not -- and the vast majority of
 22 these increased costs are related to the CSO. So
 23 that in this case, I'm not saying it's a good
 24 idea or a bad idea to conserve water, but it will
 25 do very little relative to that real cost per

1 MR. BAIRD: Rich, did you want to pick
 2 up a part of that question as far as the --
 3 MR. RAICHE: In terms of the technical
 4 components of Phase III, that's the subject of --
 5 that's the topic after the break.

6 MS. KARP: Could you say that again? I
 7 missed it.

8 MR. RAICHE: We will be talking about
 9 the technical components of the projects that
 10 comprise Phase III after the break.

11 MR. DOMENICA: But I think, Greg,
 12 before you start, I think also, as it was pointed
 13 out earlier and correct me if I'm wrong, this
 14 doesn't mean it's affordable, this is just the
 15 NBC component.

16 MS. KARP: I understand.

17 MR. BAIRD: And I think the general
 18 consensus, when everybody sees what the guidance
 19 has been since 1997, which is really the starting
 20 point that you have to start doing some
 21 affordability analysis, the general consensus or
 22 feedback is usually pushed back and they're
 23 saying, Wait a minute, it really doesn't seem to
 24 be a complete story, it seems like there's
 25 missing some other components that could add a

1 little bit more complexity to the issue. And
 2 that's where, you know, the Mayors and everybody
 3 across the nation who are being faced with these
 4 types of issues, they're coming up with the same
 5 type of feedback saying, Wait a minute, there's a
 6 lot of other things we need to consider if we're
 7 going to really talk about affordability.
 8 So right now, MWH is working with the US
 9 Conference of Mayors and others, because the
 10 methodology that we want to continue going on, we
 11 want to address income distribution and skew. We
 12 want to address the fact that we're really
 13 talking about real neighborhoods, just not a
 14 common blanket for the utility district as a
 15 whole. And we really want to bring them to the
 16 impact of what the actual bills are, because now
 17 you're talking about the real consumption of
 18 what's really happening, and it's not some global
 19 number.
 20 (BRIEF INTERRUPTION)
 21 So this is where this next phase of the
 22 approach that we wanted to go through kind of
 23 meets and exceeds some of the EPA standards.
 24 It's being supported by the US Conference of
 25 Mayors, AWWA/WEF, and it really starts to give us

1 and see those numbers down below, less than
 2 10,000; 10,000 to 14,999, these are the 16
 3 different income buckets that exist for every
 4 census track. And when you look at the
 5 population in each of those census tracks, now
 6 you can see where, say in this example for this
 7 delineated census track, 60 percent of the
 8 population is really following into the income
 9 range of really, you know, a little less than
 10 \$25,000 for that household.
 11 So this becomes a very critical component
 12 when you start talking about, what's the true
 13 impact, and it widens the picture and it says,
 14 Okay, now we're going to start having a real
 15 discussion on affordability.
 16 So what we do is we take all of the actual
 17 bills, we take the income brackets, you know, and
 18 take it to midpoint. We take all of the census
 19 data and we start trying to say, Okay, what's
 20 happening today, and we put it into the different
 21 models and then we say, Now, given those
 22 percentage -- those rate hikes, how does
 23 affordability actually change going out for the
 24 next 12 years.
 25 So this kind of goes back to the color

1 the ability to kind of focus and bring in some
 2 other economic indicators, some other issues that
 3 are occurring.
 4 Part of what has allowed that is actually
 5 some additional guidance. The whole IPF program
 6 change that the EPA rolled out in 2012 that said,
 7 Yes, we need to look at not just sewer but storm
 8 drain costs and anything else that's going to
 9 actually help us figure out what the true impact
 10 is.
 11 Now, here's an interesting graph. It tries
 12 to illustrate some things. This is just
 13 grabbing, say, for Providence County, that red
 14 line going across, \$49,000 is the median
 15 household income. And here you can see, based on
 16 all of the census tracks contained within the NBC
 17 service area, there's a huge variance of income,
 18 average income that's actually occurring. And if
 19 you just take the typical 1997 approach to it, it
 20 completely ignores income distribution, which we
 21 take into effect.
 22 The other element, and to be able to
 23 illustrate the issue, if you take one census
 24 track and now you want to weight that income
 25 distribution, you want to now take into effect --

1 coding. So if it's a light green, it's kind of
 2 the less than 1 percent. We kind of indexed it
 3 back to a 2 percent index and calibrated all of
 4 the different weights. So when you get into the
 5 red, then that's really kind of tying back and
 6 saying, Okay, now given the 2 percent index,
 7 we're calling that unaffordable. And we have --
 8 we had assumptions for inflation, we back out
 9 those inflationary numbers, and so this still,
 10 once again, kind of represents that 84 percent
 11 increase over that period of time.
 12 So this is what 2015 starts looking like.
 13 You can see where the households that are greater
 14 than 2 percent of the medium household income,
 15 you have 45,218 households out of the 118,000
 16 households. When you look at the City of
 17 Providence and the City of Pawtucket and Central
 18 Falls, they're really making up, you know, about,
 19 what is that, 72 percent of what is considered
 20 unaffordable even beginning at this 2015 number.
 21 MR. REITSMA: Excuse me. I just want
 22 to say, is there an overlay -- I mean, the
 23 service area doesn't really extend to all the
 24 areas you show. I'm just wondering what the
 25 service area is. If it's just the colored

1 blocks, not the light green?
 2 MR. ALBERTSON: So if there's any
 3 customers -- this is John Albertsen, MWH -- if
 4 there's any customers in a census tract, the
 5 whole census tract is showing up in this picture.
 6 So there's at least one customer in that census
 7 tract if it's showing up here. So, again,
 8 there's maybe not a customer in the very top of
 9 the map, but there may be someone in the bottom
 10 corner of that census tract.
 11 MR. BISHOP: Okay. I'm not sure of the
 12 population. I think this is -- I understand you
 13 can only work with the figures that you have, but
 14 it does seem though that when it comes to skewing
 15 this, even though I understand your weight -- I
 16 don't know if you're weighting by census tract or
 17 by town. When you said -- you were talking about
 18 weighting the median income, I think you said you
 19 were counting the people within a municipality.
 20 MR. BAIRD: I think if we continue
 21 forward --
 22 MR. BISHOP: Okay. Okay. Maybe you
 23 will show it. Sorry.
 24 MR. BAIRD: -- you'll be able to see
 25 the detail.

1 down into that level of detail because now
 2 there's some other costs that they have with the
 3 collection system and their storm drain system
 4 costs that have to be included to look at that
 5 specific affordability issue that they're being
 6 faced with. So right now we're only talking
 7 about NBC as a whole, and then we're going to be
 8 drilling down into that greater level of
 9 granularity.
 10 So when we take it to the next step, and
 11 this is where I want you to kind of look at
 12 what's happening, right now out of the 118,000
 13 households, we're at about 45,000 so it really
 14 represents about 38 percent of the total
 15 households of the NBC service area. When you
 16 move to 2020, that number goes up to 49,000 or
 17 just under 50,000, so we've gone from a
 18 38 percent of unaffordability households to now
 19 42 percent.
 20 MS. KARP: How are you extrapolating to
 21 the future in terms of households and household
 22 income?
 23 MR. ALBERTSON: I can jump in on that.
 24 So essentially we're doing the opposite. What
 25 we're doing is bringing things into today's

1 MR. RAICHE: Keep in mind though that
 2 blocks that build this up, those are the census
 3 tracts. So the size of the block is somewhat
 4 misleading because the census tracts generally
 5 have the same number of people in them. So we
 6 have some small blocks in there for the three
 7 cities and some large tracts in the outer-lying
 8 towns. You essentially have the same number of
 9 people in each one of the those.
 10 MR. BISHOP: I mean, I think I'd be
 11 interested to see like a number on those blocks,
 12 it would be harder to see on the smaller ones,
 13 but how many people are actually being served or
 14 how many households are being served.
 15 MR. BAIRD: The benefit of the model
 16 that we have does get into some of that
 17 granularity. Just a case in point here, right
 18 now we're only talking about NBC. So we're going
 19 to go through some slides here that's really
 20 going to say, NBC's costs, the treatment
 21 component, we're going to talk affordability
 22 there, and then we're going to have to drill down
 23 into the member communities. And we've selected
 24 three case studies, City of Providence,
 25 Pawtucket, and Central Falls, where then we go

1 dollars and we're discounting for inflation on
 2 the right so that we don't have to guess that
 3 kind of stuff. So, again, this is --
 4 MS. KARP: (Inaudible) household remain
 5 constant?
 6 MR. ALBERTSON: Yes.
 7 MR. BAIRD: So this is 2020, and then
 8 when we get to, say, 2023, now the -- and the
 9 entire service area, 62,000 households are
 10 projected to be unaffordable, so that's peaking
 11 at about 53 percent of the households in the NBC
 12 service area. When we get to 2026, we're at
 13 54 percent with about 64,000 households in that
 14 service area. And here we have kind of the three
 15 components for Providence, Pawtucket, and Central
 16 Falls.
 17 So unaffordability for Central Falls at this
 18 point, and we're talking about the NBC service
 19 area, would be 56 percent for Central Falls,
 20 about 44 percent of the households on average in
 21 Pawtucket, and Providence, unaffordable,
 22 47 percent of the households.
 23 MS. KARP: I just want say, it looks to
 24 me that this is a worst case scenario, because it
 25 assumes that the number of households remain

1 constant, the median household income remains
 2 constant, and the percent of unemployment remains
 3 constant, and that's looking over ten years into
 4 the future. So to me that's a worst case
 5 scenario in terms of affordability.
 6 MR. BAIRD: The interesting thing is
 7 when you try to project out and you say, Okay,
 8 how do you want to account for economic growth
 9 and build that in and then you say, Okay, well,
 10 if we're going to increase our O and M and we're
 11 going to increase our capital costs and have this
 12 inflationary factor, sometimes those two will net
 13 themselves out. So when you look at trying to
 14 project things out over a 12-year or a 20-year
 15 basis, you try to neutralize it as much as you
 16 can. So the best representation was trying to
 17 take a snapshot in time and say, If you did grow
 18 and things netted out or if you did grow, they're
 19 growing at the same income bucket level, they're
 20 growing at kind of the same demographics, then it
 21 would kind of still hold true to this. So that's
 22 kind of the in general assumption.
 23 MR. BISHOP: If I can read that back to
 24 you -- Brian Bishop -- so that --
 25 MR. BAIRD: Please do.

1 sudden, you know, this would look a whole lot
 2 more affordable just because of income and
 3 households. Whereas, if any more businesses and
 4 jobs and different things were lost, then that
 5 would kind of be another of downside, too. So we
 6 tried to kind of capture what we know today
 7 without trying to run high and low and medium and
 8 all these other types of analyses.
 9 MR. DOMENICA: And I think that's fair;
 10 however, a city like or an agency like NBC has to
 11 plan for the worst case. So isn't -- shouldn't
 12 this be based on a worst case, really?
 13 MR. BAIRD: Well, on the financial plan
 14 when we reviewed the capital plan and those costs
 15 when we reviewed the operations of the
 16 maintenance expenses, when we looked at reserves,
 17 we weren't necessarily trying to say the very
 18 worst case, but we kind of said, Let's assume no
 19 growth. Let's take into account the fact that
 20 some people have reduced the size of the meter or
 21 they're using less water, and so we're capturing
 22 some of those different things. And so it's
 23 conservative, but it's not trying to go
 24 absolutely worst case and that effect.
 25 So we're really trying to do a balanced

1 MR. BISHOP: -- I'm sure I understand,
 2 essentially what you're saying is that the cost
 3 of the projects are norm now and don't assume
 4 inflation -- the inflation and construction costs
 5 that even were shown in that 2018 slide, I think
 6 that we saw, that you're pulling back those
 7 assumptions on inflation and cost that might
 8 affect real bills in the future and just looking
 9 at this is if it could all happen tomorrow.
 10 MR. ALBERTSON: Yes. Correct.
 11 MR. BISHOP: Okay. Thank you.
 12 MR. DOMENICA: Greg, I have a question
 13 to follow up on Caroline Karp. This is a
 14 question -- I presume these calculations assume
 15 the same percentage of the total cost as paid by
 16 the residential component?
 17 MR. ALBERTSON: Correct.
 18 MR. DOMENICA: What if there's a shift
 19 in that where you have a significant change in
 20 the industrial commercial component in the area
 21 where you lose a significant portion of your
 22 industrial base? The costs then shift to the
 23 residential.
 24 MR. BAIRD: Yeah. Essentially if 100
 25 new businesses moved into the area, then all of a

1 dollar approach here with -- if you had a worst
 2 case or a best case, we're still trying to
 3 maintain, Okay, you know, and having all of these
 4 different meetings with NBC staff and sitting
 5 down, What do we think kind of that mid road is.
 6 MR. BISHOP: Again, I just wanted to
 7 ask from a technical standpoint, how hard would
 8 it be to take the results and approach you've
 9 done and add a little bit of three dimensionality
 10 to it around the number. If you have a number
 11 that you think is, you know, a conservative but
 12 not extreme assumption on those, whether they're
 13 assumptions about economic growth, whether
 14 they're assumptions about shift of the rate base
 15 between commercial, maybe the best idea is we
 16 borrow \$75 million and we start making 38 Studios
 17 bare because they'll use a lot of water. But
 18 assuming -- in other words, if you take some of
 19 those options and you give somewhat of a bracket
 20 around that, is that an extremely difficult or
 21 demanding task if you were given some relatively
 22 simple parameters along those lines that people
 23 have suggested?
 24 MR. BAIRD: The models are actually set
 25 up in a way so if O and M costs were going to be

1 big or more capital costs were going to get added
 2 or taken away, then that can basically project
 3 everything out fairly quickly. It doesn't
 4 automatically generate the maps, but nonetheless,
 5 our model would demonstrate, and then we would
 6 actually see how the rate increases would be
 7 adjusted one way or another.
 8 MR. BISHOP: I mean, in the old days,
 9 you get those things at the store, you know, and
 10 if you turn them this way, you know, you see one
 11 picture, and you turn it the other way and you
 12 see another picture. And now we have, I don't
 13 know, overlays in computers and stuff to do that.
 14 But I would think that -- I do think that people
 15 might be interested in a range, because I don't
 16 necessarily -- your work is finer grained than
 17 EPA, so it's not a precise replication of EPA's
 18 methodology. But I think this is graphically
 19 useful, but however you wanted to argue this, I
 20 think it might be fair to people to say, an
 21 economically worse scenario could look like this
 22 and an economically rosier scenario could look
 23 like this.
 24 MR. BAIRD: It would have to be a
 25 pretty good move positive or negative --

1 maybe, you know, it's the ratio of the hard
 2 infrastructure approach to the softer or
 3 combination of hard and soft with premium
 4 structure and whatever.
 5 Sooner or later, we're going to have to make
 6 a determination of, this is what we have to do if
 7 we're still serious about protecting Narragansett
 8 Bay and have cost effective waste water treatment
 9 facilities and a system that's resilient, by the
 10 way, that can last, and not in five years we have
 11 to decide, Oops, it wasn't good enough.
 12 Then we have to find a way to fund it. And
 13 that really should be the focus. Not this thing.
 14 Because affordability analysis can be used in a
 15 lot of ways including not so noble ways, I would
 16 suggest.
 17 So I just assume get to the point of, Okay,
 18 we know it's going to cost a lot. Now what? And
 19 we need to start thinking about, what are the
 20 more innovative ways that we can come up with the
 21 monies to pay for it. That is, if I'm not
 22 mistaken, looking at what's happening across the
 23 country, finding public/private financing
 24 mechanisms to start paying for it. Our people
 25 talking about infrastructure, banks, the models,

1 MR. BISHOP: To change the colors.
 2 MR. BAIRD: -- to change the colors.
 3 MR. REITSMA: Jan Reitsma. I don't
 4 know if it's too early to make this observations,
 5 but, first of all, I appreciate the effort to
 6 refine the analysis. At the same time, the more
 7 I hear sort of the qualifications, the more I
 8 question the utility. It seems that there are a
 9 lot of things that could happen that throw out
 10 the benefit of the analysis in terms of what
 11 could happen with the economy one way or another.
 12 So why are we doing this? I think what we can
 13 take away is something that we already know, that
 14 there's going to be a significant cost and that
 15 could impact the population very significantly.
 16 The question is, what are we trying to do?
 17 Are we trying to justify not making investments?
 18 And let me make a certain argument here. What
 19 we're really trying to do, I think, is to
 20 determine what is needed in terms of effective
 21 waste water treatment, protecting Narragansett
 22 Bay as one of our key assets. Hopefully, we're
 23 not trying to get away from that. Right?
 24 We're trying to come up and reevaluate what
 25 the most cost effective way is to do that. And

1 all of those, I think that's what we need to
 2 focus on. So I'm a little worried about where
 3 this is going or to put out analyses about
 4 affordability that you can shoot holes in left
 5 and right.
 6 MR. BAIRD: Well, there's two -- I
 7 think a couple of very important points here.
 8 First of all, this is a baseline scenario. And
 9 the EPA opens the door to be able to say, If you
 10 don't want to, you know, strictly this is when
 11 you have to do it and meet all these regulations,
 12 what are the other types of information that you
 13 need to include to try to figure out what the
 14 right timing is. And as you look at the most
 15 cost effective projects to be able to get the
 16 benefits that you need, you kind of need to have
 17 that baseline start.
 18 MR. REITSMA: Well, I would say --
 19 sorry to interrupt, but I think EPA needs to
 20 (inaudible) us and not dictate that we follow a
 21 particular methodology. We're all in the same
 22 boat, where there's no particular pathway that we
 23 know is going to lead to a solution. So my
 24 invitation to EPA is, you know, give us some
 25 flexibility.

1 MR. BAIRD: And this is where they
 2 allow the affordability and economic factors to
 3 be part of the consideration to say, Okay, what
 4 are the various options that could potentially be
 5 looked at. Now, I still want to be able to --
 6 MR. DOMENICA: Do you have time for a
 7 couple of questions?
 8 MR. BAIRD: I do. I'm just wondering
 9 if some of the slides --
 10 MR. BISHOP: Why don't you go through a
 11 few more.
 12 MR. GAGNON: Why don't you go back.
 13 No. Why don't you go back, please. I have a
 14 question.
 15 MR. BAIRD: Okay.
 16 MR. GAGNON: Michael Gagnon --
 17 MR. DOMENICA: City of Pawtucket had
 18 his hand up.
 19 MR. HILL: Lance Hill with the City of
 20 Pawtucket. The term unaffordable or affordable
 21 is a little bit of a misnomer, I think. It's
 22 really meant to be an apples to apples
 23 comparison, I think what you're saying. Because
 24 perceptually, the residents of the City of
 25 Pawtucket might have a different take on what's

1 to bring that water quality back and restore the
 2 Bay and assume some of these other benefits, is
 3 that 2 percent, you know, really the factor.
 4 But nonetheless, we're still kind of tasked
 5 with creating the baseline to look at what the
 6 impacts are to the community. And then you can
 7 start looking at additional scenarios, capital
 8 plans, and other things to be able to say, Okay,
 9 how does that baseline change.
 10 So if an infrastructure bank or another
 11 funding mechanism would be able to get a better
 12 cost of capital, then we would change the
 13 assumption. So it's not a 3 percent or it's a
 14 5 percent for cost of capital. You know, those
 15 things can be adjusted so we have a better idea
 16 on what's really going on.
 17 This is 20-year debt. What if we went 30
 18 year, 50 year. I mean, there's century bonds
 19 that are out there. I wouldn't recommend it.
 20 But at the same time, there's other things to be
 21 able to do to change the financial model. But
 22 the model, the baseline, basically have to be
 23 created to say, Here's a starting point. It does
 24 not -- what this doesn't say is, you know, Hey,
 25 no, it's afford -- it's all unaffordable and now

1 affordable to them and what's not affordable to
 2 them. The one thing that's sort of missing, I
 3 think, is that if we don't do anything at all,
 4 there's a large cost to all the other
 5 stakeholders that are in the room. So they may
 6 not necessarily just be NBC rate payers, these
 7 are for all taxpayers.
 8 MR. BAIRD: Right. And that's where,
 9 when you look at even the discussion of that
 10 2 percent of your median household income, if
 11 you're at the 10 to 15,000, you know, annual
 12 salary, yeah, it could be 4 or 5, 6, 8 percent of
 13 your household income going forward. Whereas, as
 14 you kind of push out further in those different
 15 income buckets, then you hit the 2 percent, and
 16 then, you know, there's a lot of income buckets
 17 where it's half a percent or less, even when you
 18 cast it out.
 19 So that perception of affordability can be,
 20 you know, different for every household. When
 21 you look in the industry, all of the discussions
 22 on the value of water and all these different
 23 pieces, so a lot of people are starting to stay,
 24 you know, maybe 2 percent isn't really the good
 25 index, because for the things that you have to do

1 we have to not do anything. This is just another
 2 component that we have to look at as we look at
 3 what's the cost effective projects that are going
 4 to meet the water quality needs. So it's kind of
 5 a balanced approach, but this is still one of
 6 those things that needed to be discussed. So --
 7 MR. DOMENICA: Can we hold the
 8 questions? There's a few hands up. Can we hold
 9 them and let Greg finish the presentation?
 10 Remember your question. We'll come back to it.
 11 MR. BAIRD: So kind of as a quick
 12 without Phase III, without -- with Phase II, just
 13 kind of what it would look like there on a map
 14 dealing with the different census tracks. Now,
 15 here's the other component. We've really been
 16 talking about NBC's costs spread across the
 17 118,000 households. When we look at the member
 18 communities, now we have each of these member
 19 communities, they have a unique medium household
 20 income, they have a certain number of households,
 21 and to really then take it to that next step or
 22 level granularity, now you need to really look
 23 at, okay, taking into account the community
 24 factors, what are some of the economics that
 25 might impact them.

1 We worked with PAR to try to say, besides
 2 NBC's costs, we know that each of these
 3 communities also have infrastructure and
 4 collection system that basically needs to be
 5 taken care of. When we look at the total pipe
 6 length for their collection system or their sewer
 7 pipes and we look at an estimated average pipe
 8 age, you can see where there's some issues here.
 9 And then we calculated the annual pipe
 10 replacement miles per year to try to get back to
 11 more of an average spot. You don't want most of
 12 your pipe to get aged, because at some point you
 13 can't replace it enough before it starts failing
 14 without tearing up, you know, all of your
 15 streets.
 16 Then we've been able to calculate some
 17 annual costs that would actually -- you know, on
 18 an annual basis to meet this conservative annual
 19 pipe replacement program, this is probably what
 20 they would need to do.
 21 Now, having said that, are they doing it?
 22 No. Will they do it to this degree? It depends.
 23 A lot of these municipalities, they don't have a
 24 separate enterprise system or a separate rates
 25 and fees associated with their sewer collection

1 looking at sewer costs?
 2 MR. BAIRD: This is not looking at
 3 affordability impacts on the water side.
 4 MR. BISHOP: Okay.
 5 MR. RAICHE: But on storm water.
 6 MR. BISHOP: Well, you talked about
 7 storm water collection, but what it that needs to
 8 be treated to the extent that it's not actually
 9 part and certainly in some of the outlying
 10 communities not part of the NBC combines who are
 11 overflows?
 12 MR. RAICHE: There is some information
 13 about what cities and towns are currently doing
 14 in terms of not only maintaining the pipes, but
 15 also water quality improvement. However, what
 16 that standard is here now is fairly lower than
 17 what we anticipate coming out of EPA in the out
 18 years. So we do have a small component of that
 19 built in. But not knowing where the (inaudible)
 20 Phase II is going to land with the next round, we
 21 can't really make --
 22 MR. BISHOP: So that's skewed to the
 23 current baseline, whatever it is.
 24 MR. RAICHE: It is. It could be worse.
 25 These are fairly conservative assumptions on the

1 system. It's general taxes. So out of the
 2 property taxes, essentially if a sewer line
 3 collapsed, then essentially it's an emergent
 4 repair and they're going to pay that money to fix
 5 that pipe and to fix the street and continue on.
 6 And that's pretty much the general practice that
 7 we're seeing.
 8 The other element that we need to kind of
 9 include is, you know, some of the different storm
 10 drain capital improvement project needs. And so,
 11 once again, the length of pipe, the average
 12 years, and an estimate for the annual costs. So
 13 these are the other components that we wanted to
 14 be able to include when we are going to look at
 15 our three case studies. Rich, did you have
 16 anything to say?
 17 MR. RAICHE: Unless there's a question
 18 that comes up, we can talk about how the numbers
 19 were derived.
 20 MR. BAIRD: They probably want to see
 21 the impact.
 22 MR. BISHOP: Brian Bishop. I just want
 23 to ask very briefly, what I don't see in this is
 24 any sense that there may be costs for surface
 25 water treatment pursuant to -- are we only

1 amount of pipe that needs to be replaced and what
 2 needs to be done, but there are more worse case
 3 scenarios out there on the horizon that could
 4 factor in.
 5 MR. BAIRD: It doesn't take into effect
 6 maybe an asset management program that would look
 7 at the condition-based replacement needs or the
 8 risks that are associated with that. That would
 9 need to be done more site specific.
 10 Now, when we get into these three case
 11 studies, trying to draw on the information, City
 12 of Providence, on average, they're spending maybe
 13 50 to \$100,000 on emergency repairs, we have the
 14 estimated infrastructure costs, and we're
 15 assuming that CIP would be debt financed using a
 16 debt at 4 percent for 20 years. We needed some
 17 assumption there. So now you can see kind of the
 18 NBC costs that we had talked about, with
 19 Providence's share of being able to take care of
 20 the infrastructure, so everything that's been
 21 taken care of from the treatment plant to the
 22 collection system given these assumptions.
 23 MR. HILL: Lance Hill with the City of
 24 Pawtucket. Does the blue line, the blue table
 25 here, you're saying that that is the cost

1 factoring in the --
 2 MR. BAIRD: That would be the average
 3 bill for all of the census tracks associated with
 4 the City of Providence starting in 2015 with the
 5 rate increase escalations over the 12-year
 6 period.
 7 MR. HILL: And also doing the storm
 8 water --
 9 MR. RAICHE: That's the red bar.
 10 MR. BAIRD: And then the red part would
 11 include the 8.3 million per year on the waste
 12 water CIP and the 1.2 million on the storm drain
 13 CIP. And it assumes the current level. It
 14 doesn't change on the emergency repairs. So when
 15 we put that into the model, then we can see
 16 where -- I'm going to point to this. Right here,
 17 this is kind of that 2 percent index on NBC
 18 costs. So that's where really in 2023 the NBC
 19 component hits that 2 percent. And then when you
 20 add in the City of Providence components, you can
 21 see that that 2 percent has gone -- threshold has
 22 reached a couple of years earlier in 2021.
 23 This is the census tract in the City of
 24 Providence with the number of households and the
 25 average medium household income for each of those

1 do that, you would be taking that red portion and
 2 putting it into the CSO. The same work would
 3 have to be done in terms of rehabilitation of
 4 existing pipes, but it would just be changing
 5 buckets.
 6 MR. HILL: But the additional
 7 expenditures on replacing what you're assuming is
 8 \$4 million per year on waste water CIP, that
 9 would be addressed the Narragansett Bay
 10 Commission work Phase III?
 11 MR. BRUECKNER: No, it wouldn't.
 12 Because -- Brueckner, Tom Brueckner. What we'd
 13 use is -- we'd put in new storm drains, but we'd
 14 use the existing pipe for the sanitary flow.
 15 That's how we'd separate it. So that old
 16 sanitary pipe would still be in service for
 17 sanitary flow.
 18 MR. BAIRD: So NBC would take care of
 19 the treatment and the interceptors, but the
 20 entire collection system still is the
 21 responsibility for the municipalities.
 22 City of Pawtucket: When you kind of break
 23 it down, once again, given the total service area
 24 for the NBC only, it doesn't hit red, but when
 25 you add in the Pawtucket work, given some of

1 census tracks. And that's where you can kind of
 2 see over a time series with those rate increases,
 3 because the large capital projects, how things
 4 start changing over time.
 5 When you put it into a map, then you can
 6 kind of illustrate, you know, what's really
 7 happening here to get to by 2026 the 33,880
 8 households. There are 55 percent of the
 9 households in these census tracks that have
 10 reached the 2 percent.
 11 Pawtucket: Currently, we've estimated about
 12 80 to 100,000 per year spent on maintenance of
 13 the infrastructure, estimated infrastructure cost
 14 improvements at about 4 million. And to try to
 15 turn that average age back, about 195,000 per
 16 year on storm water CIPs and the debt assumption.
 17 So here, once again, we can kind of see the NBC
 18 costs, and then kind of the red bar representing
 19 what's on top.
 20 MR. HILL: Again, Lance Hill with the
 21 City of Pawtucket. Just to be clear, if the CSO
 22 separation were to move forward, that red portion
 23 would disappear from that; right?
 24 MR. BAIRD: No.
 25 MR. RAICHE: Essentially, were you to

1 these estimates, then we would see where it hits
 2 the 2 percent in 2022. And then for each of
 3 those different census tracks, you can kind of
 4 see how that changes over time. To put it on the
 5 map, we can kind of see how that changes with
 6 about 52 percent of the households reaching that
 7 2 percent for this case study.
 8 Central Falls: So we have kind of a large,
 9 medium, and small. They're spending about zero
 10 on some of the infrastructure. They would need
 11 to spend 680,000 per year on their waste water
 12 CIP. I don't think they have the same --
 13 MR. RAICHE: They don't have any pipes.
 14 MR. BAIRD: Yeah. Pipes for the storm
 15 water CIP. But nonetheless, you can see where
 16 the NBC gets projected out. But there would
 17 still need to be -- the City of Central Falls
 18 would need to take care of their collection
 19 system and infrastructure. Given a lower medium
 20 household income overall, you can kind of see
 21 where in 2022 for NBC costs only, how it hits the
 22 2 percent, and then if they did the
 23 infrastructure components at that assumption
 24 level, then it would be 2021. And, obviously,
 25 they're a smaller size, so there's the census

1 data for them. So as we time map this out, we
 2 can kind of see how this plays out for this case
 3 study for Central Falls, putting that at an
 4 estimated 61 percent of the households at that
 5 2 percent or greater range.
 6 Now, we need to remember that, remember
 7 those 16 number buckets? If there's somebody
 8 living here from Lincoln and they moved down into
 9 Central Falls and their income is at 150, you
 10 know, then they're in there. But, you know,
 11 we're looking at kind of average at midpoint in
 12 there, and so all of the other households would
 13 kind of still turn that area red.
 14 If we were talking about kind of that
 15 2 percent threshold, if a household was making
 16 less than 25,000 a year or 10, 15,000 with
 17 different subsidies, then it would be something a
 18 whole lot higher than the 2 percent. In any
 19 community, there's always those demographics.
 20 Even if I did Lincoln here, there could be
 21 some low income households, you know, in there,
 22 but then you're looking at kind of the averages
 23 and how that actually plays out in weighing those
 24 averages. So every demographic can kind of be
 25 found in different census tracks, but this is

1 MR. GADON: No. Greg.
 2 MR. BAIRD: In the discussions when I
 3 presented the methodology to the US Conference of
 4 Mayors/Mayors Water Council, there was a number
 5 of different discussions for some of the
 6 attending Mayors, and they liked the fact that
 7 this starts addressing some of those shortfalls
 8 in the '97 documents for income skew. And, yes,
 9 of course, they will say and come up with, you
 10 know, maybe we can do something different.
 11 But then as many mayors were in the room,
 12 you're getting that many different ideas, and
 13 every jurisdiction has some sort of constraint.
 14 Either the, you know, debt ceiling, taxable
 15 ceilings, what's happening with their county, and
 16 that's where I think the discussion really gets
 17 fragmented.
 18 So aside from a discussion saying, Okay, the
 19 city doesn't necessarily want to figure out the
 20 funding mechanism to build everything to take
 21 care of their collection system, and do they want
 22 to transfer, you know, those assets over to NBC,
 23 and then NBC would need to build that into the
 24 rate base to take care of that.
 25 There's been different discussions, but for

1 kind of a way we can see in general, what's the
 2 overall impacts as we move forward.
 3 With that, that was my last slide, so now we
 4 can open it up for questions and I can go
 5 backwards to point out anything, if we need to.
 6 MR. GADON: Now, you said you spoke
 7 with the Mayors, and we're looking for an
 8 equitable way of affordability. Presently, it
 9 seems like the real estate taxes. It's more fair
 10 and equitable. Bigger house; bigger tax. Have
 11 you ever considered rate reform, like congress
 12 may consider income tax reform this year, in that
 13 charging the future debt service perhaps to the
 14 municipalities and NBC continuing on with O and M
 15 and perhaps taking over all their other pipes?
 16 Has that been a consideration?
 17 MR. BAIRD: Different --
 18 MR. GADON: It would be politically
 19 possible.
 20 MR. GAGNON: Michael Gagnon, Town of
 21 Lincoln. Not -- and stay under the maximum tax
 22 increase rate of 3 percent? How?
 23 MR. GADON: Maybe it would fall within
 24 that, but have you considered a rate reform?
 25 MR. GAGNON: Personally?

1 this model, we had to basically separate what we
 2 know for NBC right now, and then drove down on
 3 these different case studies to try to capture
 4 what's really happening today. The models are
 5 robust enough to run some of those different
 6 potential scenarios, but we would want to see a
 7 scenario that would be applicable to all of the
 8 communities.
 9 MR. COLT: Ames Colt. Just more of a
 10 specific question. At the beginning of the
 11 analysis, you made an assumption about the
 12 maximum amount of financing available to NBC from
 13 the state SRF.
 14 MR. BAIRD: Correct.
 15 MR. COLT: How do you reach that
 16 calculation?
 17 MR. BAIRD: It was our understanding
 18 that the state had said that, what, half of some
 19 of the state allocation funding could go towards
 20 this.
 21 MR. ALBERTSON: We used the 25 million
 22 a year in future years.
 23 MR. COLT: Okay. Two more if --
 24 MR. BAIRD: Working with NBC finance,
 25 that's where they said, Yeah, this would --

1 MR. ALBERTSON: We know for sure. It
 2 could change, though.
 3 MR. COLT: This is a question for NBC,
 4 as well. I think this is a very useful baseline
 5 analysis. We knew it was coming, but the numbers
 6 are good to have. To what degree can we use this
 7 model approach for additional analyses,
 8 particularly the degree to which we can increase
 9 the time frame of the Phase III project and see
 10 what a difference that makes?
 11 MR. BAIRD: Well, remember how we
 12 spread -- we saw the graph for the spread of the
 13 projects over the 12-year basis? If
 14 negotiations, you know, with the UPA were such
 15 that under this other scenario, now instead of
 16 building it in a ten-year basis, now it's going
 17 to get stretched over a different period of time.
 18 Then we would actually make adjustments into that
 19 CIP model and we would see where it showed up
 20 red, it would actually get essentially pushed out
 21 further into the future.
 22 MR. COLT: So wouldn't we want to do
 23 some of that scenario analysis before we sat down
 24 and tried to negotiate an integrated permit or
 25 something like that?

1 MR. BAIRD: What's interesting is in
 2 Rhode Island, the Corps of Engineers has kind of
 3 pushed back to basically say, you know, Okay, if
 4 municipalities want to be able to continue
 5 drawing on the funds for the state revolving
 6 funds, they need to come up with an asset
 7 management plan and submit it. So that basically
 8 starts saying, now the individual cities are
 9 going to need to start analyzing not just know
 10 what assets we have, but get an idea of what the
 11 condition is, because everybody knows that if
 12 you're waiting for the sewer line to break and
 13 that segment of the street to collapse, that's
 14 going to cost two to three times, maybe four
 15 times more, let alone business and traffic
 16 disruption, than if it was done on a proactive
 17 basis.
 18 So we've kind of built in some assumptions
 19 to say, let's start turning that around, but
 20 really, that's conservative or not, depending on
 21 what the condition is. And some cities might
 22 have done some inspection of their lines and they
 23 have an idea of how much more life there is there
 24 and they might have some maintenance that they
 25 could throw on to it to extend the life of that

1 MR. BAIRD: Rich, do you want to talk
 2 about the process?
 3 MR. RAICHE: Yeah, sure.
 4 MR. COLT: And then finally, just --
 5 MR. RAICHE: Tom has another --
 6 MR. COLT: Oh. Sorry.
 7 MR. BRUECKNER: Well, I was going to
 8 answer your question. I think the intent here
 9 is, the next presentation will be -- Tom
 10 Brueckner -- will be on alternative costs. And
 11 then the next meeting in November will be to come
 12 up with a recommended plan and alternatives based
 13 on all of the discussion today. And that will be
 14 something that will be considered, so it's going
 15 to be, what we should build, schedule, and
 16 affordability, will be part of the next meeting.
 17 MR. COLT: And then finally, more of a
 18 technical question, in terms of talking about
 19 capital improvement projects for both sewer and
 20 storm water pipe systems, you mentioned that if
 21 you fall behind too far, you run into a situation
 22 as a municipality where you essentially can't
 23 keep up. Is that sort of manifested in the terms
 24 of emergency costs exploding or how can we sort
 25 of anticipate that point?

1 asset, and those are some of features that would
 2 be captured in an asset management plan to then
 3 potentially get, you know, additional state
 4 funding.
 5 MR. DOMENICA: I see a number of
 6 questions here. We're about ten minutes behind
 7 schedule. A quick one.
 8 MR. HOLMES: A quick one. If you're
 9 going to slow down the projects, you're going to
 10 have to slow down the individual pieces and take
 11 smaller bites one at a time. If you say, Well,
 12 we're going to put the pipe, once you get the
 13 machine on site and in the ground and moving, you
 14 want that thing to go as fast as possible,
 15 because it will cost you less in the long run.
 16 The more feet per day they manage to drill, then
 17 you want those guys drilling. You don't want
 18 them standing around with shovels.
 19 MR. BAIRD: You're right. And that's
 20 where on some projects, and this is part of the
 21 analysis when they said, how much, what dollar
 22 cost, and on what year, they had to take that
 23 into effect. Because if they said, Okay, we're
 24 going to take this component of the project and
 25 we're going to space it out, well, just the

1 mobilization and demobilization costs --
 2 MR. HILL: Yeah. There are some things
 3 you can't spread out and you don't want to spread
 4 out.
 5 MR. BAIRD: At some point you need to
 6 repair the streets that needed to get those
 7 changes --
 8 MR. DOMENICA: Greg, hold on one
 9 second. I mean, Jan had his hand up. Let's take
 10 one more comment. You have one, Jan?
 11 MR. REITSMA: Yes. I forgot to make a
 12 point as part of my last observation. When I
 13 talk about Narragansett Bay as an important
 14 asset, I think most people know that I'm not just
 15 talking about environmental asset but economic
 16 asset. And I also believe that if we somehow try
 17 to postpone investing in this project or drag it
 18 out, it will be a bad economic impact from that.
 19 So that's a concern that I have.
 20 Related to that, I don't know if that's
 21 outside the purview of this particular group, but
 22 I'm curious as to how you go about exploring your
 23 various financial strategy options. Because
 24 these days, I know that a lot of people around
 25 the country are looking at, what are your

1 appreciate the numbers. I have to -- I
 2 appreciate the sentiment expressed, but my
 3 position in viewing how the project is segmented
 4 and the cost is covered very much focuses on the
 5 sense that these clean water goals arise not as
 6 some abstract desire of the state for a clean
 7 bay, but of the responsibility for the people
 8 that essentially use the resource, you know, here
 9 as a receiving water, and I'm quite loath to try
 10 and take the model of kind of offing those costs
 11 to the larger people who benefit. And it's
 12 not -- it is not to suggest that there is not
 13 financial capacity. That's what a state
 14 revolving fund is after, a fashion, is putting
 15 the state's credit behind the credit here. So
 16 I'm very cautious that we use that model. I'm
 17 actually more akin, I think, if we look -- that's
 18 what we did, that's what the stakeholders'
 19 process is all about. We're here for the Bay.
 20 So to the extent this seems to obscure that, I
 21 second what Jan said.
 22 But what the first process accomplished, was
 23 to have a stop arguing about whether or not we
 24 were going to spend \$560 million or \$570 million
 25 and decide, what's the lowest hanging fruit and

1 strategic options, and at some point I would love
 2 either to have a presentation about it or sit
 3 down with a smaller group, perhaps, and look at
 4 that. Because I think it's becoming more and
 5 more critical that we look at that and see what
 6 ways there are to get some relief on the issue of
 7 rate pay or impact and affordability and all of
 8 that.
 9 MR. DOMENICA: Absolutely necessary?
 10 MR. GAGNON: Michael Gagnon, Town of
 11 Lincoln. I'd like to, before the break, leave
 12 you with a little thought. Jan has brought up a
 13 great point that the Bay is here for the whole
 14 state and perhaps we should not think about
 15 lengthening the time of this construction but
 16 shortening the time, being a little more
 17 aggressive, and expanding the tax base. So the
 18 state in its entirety should be bearing the cost
 19 of this; not just the seven communities.
 20 MR. BISHOP: Mike, I'm sorry. It's
 21 Brian Bishop. I know I spoke a lot, but I was
 22 mostly being technical and I held from the
 23 discussion that Jan began. Because I think he is
 24 trying to get the nub of the debate we're having
 25 which the numbers can't disguise. So I

1 get the shovels in the ground. I'm open to the
 2 reality that if a tunnel is a low-hanging fruit
 3 for this, that some minimal amount would have to
 4 be spent on that. We don't want to send them
 5 home and have them come back. But from a policy
 6 perspective, that's why I'm here.
 7 MR. DOMENICA: As Tom said, this will
 8 be the subject of the next workshop, as well. So
 9 let's take a break here. Ten minutes. Be back
 10 at five for part two.
 11 (BRIEF RECESS)
 12 MR. RAICHE: So we'll start the second
 13 part of the alternative analysis. Last month we
 14 discussed how we came to where we are with the
 15 alternative analysis. We first went through the
 16 process of defining alternatives. First, a
 17 technical feasibility screening. A lot of that
 18 knocked out a lot of potential alternatives,
 19 simply because we've got very constrained sites
 20 and left us with a limited number of
 21 alternatives. So.
 22 What are we talking about? Again, just by
 23 means of a refresher, the baseline, this is
 24 what's in the CDRA. We have a number of
 25 catchments pegged for sewer separation. And then

1 the lion's share of the individual CSOs are
 2 contributing to the tunnel.
 3 So the tunnel has a couple of components.
 4 Both the tunnel capturing individual CSOs
 5 directly by drop shafts, and then a number of
 6 interceptors to bring the CSOs that more further
 7 afield to that central tunnel location. And then
 8 we also have a number of regulator modifications
 9 that control some CSOs by forcing flow through
 10 the existing interceptor system to where it could
 11 be relieved by a drive shaft and tunnel.
 12 The alternatives to that -- again, these are
 13 the ones that then become technically feasible
 14 after we eliminate the impossible, as Sherlock
 15 Holmes would say, our hybrid GSI and sewer
 16 separation areas. We determined that GSI, in
 17 general, is not sufficient to solve the CSOs
 18 across the district.
 19 This is not anything that isn't being
 20 encountered in other areas in the country. The
 21 general conclusion is that GSI is a component of
 22 a CSO program, and generally GSI needs a
 23 corresponding gray infrastructure piece.
 24 And in the instance of the sewer separation
 25 areas, we kind of have a hybrid, putting GSI

1 bit about where we are on the GSI that can inform
 2 our analysis in the next three very short weeks,
 3 between now and November.
 4 MR. REITSMA: And related to it, maybe
 5 this is late, I should have suggested it earlier,
 6 but it's sort of the concept of a second opinion.
 7 MR. RAICHE: This is a second opinion.
 8 MR. REITSMA: It's based on having had
 9 the opportunity to look at a lot of projects in a
 10 national competition and being stunned by some
 11 pretty aggressive applications of green storm
 12 water infrastructure in other communities
 13 including large cities. So the question is, if
 14 someone else were to take a fresh look and say,
 15 Gee, have we really given it our best?
 16 MR. ANDERSON: Hold those thoughts.
 17 We'll do it. You're absolutely right. That's a
 18 very important distinction that we need to make.
 19 (QUESTION BY AN UNIDENTIFIED SPEAKER)
 20 MR. RAICHE: The sub-tunnel is a second
 21 alternative. One of the more difficult
 22 individual CSOs to accommodate is 220, which is
 23 in Pawtucket on the Moshassuck. It's sort of an
 24 outlier. Most of the CSOs that we're talking
 25 about dealing with are on the Blackstone in

1 where there are opportunities and then doing
 2 sewer separation in the area of where the
 3 opportunities are not.
 4 In terms of alternatives to the tunnel, the
 5 concepts are the same. Storage of CSO volumes:
 6 Rather than storing it in a deep rock tunnel,
 7 storing it in a near surface tank. And, again,
 8 using GSI in select sewer sheds where we have
 9 either a cost benefit, we can reduce the size of
 10 the tank by doing GSI, and that's cost
 11 competitive. Or where we know that we have some
 12 serious site constraints, which is a number of
 13 sites, and need to do GSI to get that end of pipe
 14 volume down to a size where we can physically
 15 control it with a tank that meets those site
 16 constraints. And, again, regulator
 17 modifications, to force flow through the existing
 18 interceptor network to a point where you can
 19 accommodate it.
 20 MR. REITSMA: Jan Reitsma. Is there a
 21 way to generally or ballpark quantify the portion
 22 of the green storm water infrastructure making up
 23 your general solution --
 24 MR. RAICHE: We will come to that
 25 number in November. Nick will now speak a little

1 Seekonk. Almost all of them. Then we have one
 2 outlier. And that becomes difficult from an
 3 engineering standpoint, how to solve that
 4 problem. So we do have another alternative for
 5 that, and that is the stub tunnel, rather than a
 6 cross-town interceptor.
 7 MS. KARP: I have a question for all of
 8 the contractors in the Bay Commission. A while
 9 back you gave us this map showing the current
 10 state of the Providence River, up the
 11 Narragansett Bay, Seekonk River, and these are
 12 wet weather data, because we're looking at CSOs
 13 and it makes sense there's a wet weather data. I
 14 want to be clear that I understand the goals.
 15 What are the Clean Water Act goals here? What
 16 are we trying to achieve in the Seekonk and the
 17 upper Narragansett Bay? And I ask that for a
 18 really important reason. And that is that right
 19 at the outfall of Bill's Point, we used to use
 20 this language of (inaudible), it seems to me if
 21 when we're zoning, we could still say, we have no
 22 reasonable expectation of reaching a fecal
 23 coliform of over 50 MPN right at the outfall. So
 24 it seems to me our goal is to try to restore use
 25 in the Seekonk, except for these areas right by

1 the DVDC, and restore use in upper Narragansett
 2 Bay, except that -- not right at Bill's Point.
 3 We don't really want people swimming and fishing
 4 right at the outfall. So are all of these
 5 proposals basically geared at reaching 50 MPN or
 6 less than 50 MPN so that these waters are
 7 fishable or swimmable or are we taking into
 8 account that this is a heavily industrialized
 9 area, heavily populated, and we never -- really,
 10 we ought to be saying, (inaudibly) we don't
 11 expect to achieve that. It's really from the map
 12 you presented to us. So what are our goals here?
 13 MR. BRUECKNER: Our goals are to meet
 14 the Clean Water Act requirements of EPA, which is
 15 to meet the water quality standards at all times.
 16 MS. KARP: So the outfalls, though,
 17 realistically, is it going to be possible to get
 18 to 50 MPN unless you basically kill every living
 19 thing --
 20 MR. BRUECKNER: That's what we will
 21 find out. I think the answer is for every storm,
 22 I find that hard to imagine.
 23 MS. KARP: So that's not doable in my
 24 opinion, and we still allow for a certain number
 25 of overflows. So that brings on the question,

1 to achieve. That's what we have been directed to
 2 by mandate.
 3 MS. KARP: But, reasonably, even with
 4 Phase I where we stand today, we know that the
 5 certain (inaudible) are unmeetable. You cannot
 6 design a system to catch 100 percent of the storm
 7 flow and treat 100 percent of that flow all the
 8 time. We're already designed not to meet the
 9 standards.
 10 MR. BRUECKNER: Correct. And I think
 11 that it would be a use and cleanability analysis,
 12 which we haven't done yet. And even that is a
 13 short-term thing. It would last for only five
 14 years. So I don't think reasonableness is
 15 necessarily factored into what the EPA is
 16 requiring other than the discussion about
 17 affordability and what you can afford.
 18 MS. KARP: How about the use of
 19 cleanability analysis, when does that come in?
 20 There's still homes, for example, in the last
 21 round that were very vulnerable about use of
 22 cleanability, as Save the Bay was. I want to
 23 hear something about uses here that we're trying
 24 to achieve. I think those uses are important,
 25 and I guess I want to know how that factors in.

1 what uses are we trying to protect, and in that
 2 weather, are we realistically trying to have
 3 people out fishing in wet weather in the Seekonk
 4 river or right below the outflow. It seems to me
 5 a reasonable society would say, what really --
 6 what are the reasonable uses here and what are
 7 we ending at? Are we really ending at swimming
 8 in upper Narragansett Bay in wet weather?
 9 Probably not. So I just want to hear more
 10 explanation of water quality goals in reaching 50
 11 MPN --
 12 MR. BRUECKNER: Well, 50 MPN is not
 13 actually the standard everywhere. It varies
 14 whether you're in fresh water or shellfishing
 15 areas or swimming. So it could be 14, it could
 16 be 50, it could be 200 depending on where you
 17 are. But I think it was made clear by EPA
 18 through our numerous discussions at the beginning
 19 that the long-term goal is to meet water quality
 20 standards all in time. That's what the Clean
 21 Water Act requires.
 22 So the only thing I can say to you,
 23 Caroline, is that NBC is working under the
 24 requirements established by EPA. We did not
 25 develop these standards for what we are required

1 MR. BRUECKNER: I think the answer is
 2 that we're not really looking at the uses. What
 3 we're focusing on is meeting the water quality
 4 standards, the criteria as we've been directed to
 5 do so in our concept agreement and in our permit.
 6 MR. LIBERTI: Angelo Liberti with DEM.
 7 Not to belabor this, because we could spend half
 8 a meeting or a full meeting on the details here,
 9 but I think where I try to steer us and I think
 10 where we started from here was that we're trying
 11 to put together a plan that we think is the
 12 correct plan, all factors considered, and move
 13 forward. That's what was done the first time
 14 around; that's what we're looking to do here.
 15 There's only one place in the country that I
 16 know of that has done a full use attainability
 17 analysis and gotten a sign off, that the
 18 standards were reduced. And it's an effort that
 19 I don't think is worth going through.
 20 But I think we're going to end up here with
 21 a plan that everyone agrees with or the majority
 22 consensus that it's the right plan to move
 23 forward with, that it will impact the uses during
 24 certain conditions, and the uses will not be
 25 available at all times and at all places, but

1 it's a good investment. And then after it's
 2 implemented, that will probably be the more
 3 appropriate time to say, Okay, now we want to do
 4 the use attainability, we've done enough, we've
 5 achieved this level of water quality.
 6 Because we can struggle with ending this
 7 with an application to EPA for a downgrade and a
 8 use attainability. At this point, I think we
 9 still could look at the alternatives with a
 10 recognition that there's virtually no CSO plan
 11 out there that one hundred percent of the time
 12 meets water quality standards, and we're trying
 13 to put forward a good plan and move forward. And
 14 when we get to the end, we'll figure out when is
 15 the right time to do a use attainability.
 16 MR. DOMENICA: Let's put this
 17 discussion off until the next workshop, because
 18 this is a little off target for today's subject
 19 right here. And we will have time to look at
 20 this in conjunction with the whole picture next
 21 time. Also, we're running late, so let's move on
 22 here.
 23 MR. ANDERSON: My name is Nick
 24 Anderson, as many of you know, from MWH. And
 25 we're just going to touch on the green. And Jan

1 going to do it; it's agency a question of where
 2 are we going to do it and how much are we going
 3 to do. And I think, probably the things we heard
 4 just before the break, sort of from my
 5 perspective on a technical level, sort of, I
 6 think that was the general feeling. Correct me
 7 if I'm wrong, but I think the room kind of
 8 agrees, something has to be done. We just have
 9 to pick the right thing.
 10 So moving on very briefly, the GSI
 11 technique, you can see, is very atypical. We
 12 looked for the best opportunities. And in
 13 amongst that, we did it in all those
 14 sub-watersheds that Rich talked to you about ever
 15 so briefly.
 16 What we've got here is a graph that shows
 17 the impact that GSI could have on the CSO
 18 overflows as they currently stand. Now, remember
 19 we've been talking about this three-month storm,
 20 so this is what these numbers represent. Now,
 21 GSI is not a one-time only fix, it will be used
 22 time and time again through a number of years.
 23 So once it's filled, it has a persistent reuse.
 24 That's an important factor to consider.
 25 Although these volumes may look somewhat

1 said it very nicely, so let's get into it. Three
 2 slides, I promise.
 3 You remember we talked about conceptual
 4 designs, how we appraise the green? Green was
 5 judged in a slightly different way. It's a lot
 6 of the gray analysis. The reason being is that
 7 it's so desperate and diverse. At this stage
 8 it's very difficult to pin it down. And
 9 particularly in a time scan for a reasonable
 10 cost. We've got to kind of take a view on what's
 11 applicable.
 12 So we did these conceptual designs across
 13 the whole service area, maybe seven or eight
 14 designs, and then we just factored those across
 15 the service area. So the numbers you're about to
 16 see are conceptual design that's being escalated.
 17 It doesn't necessarily mean that we've gone right
 18 down to the minutia of it, but this is a typical
 19 conceptual design. If you remember, we also
 20 talked about the public and private aspects of
 21 GSI. This is exactly where you were going, Jan,
 22 with the aggressive nature.
 23 In many senses, this sort of encapsulates
 24 the whole project for me, in terms of, this isn't
 25 a question of are we going to do it, are we not

1 tempered, should we say, and perhaps what you
 2 were hoping to see, what you will notice is that
 3 in terms of impact, they are very variable. So
 4 some have a very large impact, but it's a very
 5 large overflow in the first instance that, for
 6 example, is 205 where we've got the existing
 7 conditions doing almost 13 million gallons. If
 8 you do the public only GSI, then that reduces to
 9 about 11.8. And then if you do the whole thing,
 10 you're doing round about nine.
 11 So it's not to be underestimated.
 12 4 million gallons is a huge chunk out of the
 13 overflows, but it's not necessarily taking away
 14 the entire overflow. I think that's what we
 15 found. This is a very mature urbanized
 16 watershed. And squeezing in GSI under the terms
 17 that we've been talking about has not been the
 18 easiest of the challenges. There is room for
 19 maneuver in the future. There's no question
 20 about that.
 21 But in terms of what we could positively
 22 hang our hats on and putting a program together
 23 means that the GSI that we've looked at has not
 24 necessarily included things like green roofs on
 25 residential properties, and it hasn't looked at

1 localized rainwater (inaudible) and things like
 2 that.
 3 The reason being is that is somewhat beyond
 4 my control, legislation and the weather, both of
 5 which have a huge influence on my life. So I'm
 6 not really in control. But the point being, some
 7 of the smaller CSOs that you can see, 101, 206,
 8 and ones you can barely see, 27, 28, 29, they are
 9 very small overflows anyway. So introducing GSI
 10 into those particular watersheds will have a very
 11 positive effect that could actually (inaudible).
 12 That's important. Because what we're looking to
 13 do, as we say, is build a program that
 14 encapsulates green infrastructure. So when you
 15 put these numbers into a table --
 16 MR. BISHOP: Sorry. I only wanted to
 17 ask, and it's obviously not meant to be seen
 18 here, but one of the concerns I have is not only
 19 the possibility of clipping the tiny ones, but
 20 the recalling that -- I'd like to look at this
 21 almost in a cost per gallon kind of metric.
 22 MR. ANDERSON: Don't spoil it.
 23 MR. BISHOP: Okay.
 24 MR. ANDERSON: Okay. So just as a
 25 summary of those numbers, so what we're saying

1 do is in the future have a potential influence
 2 over some of the gray that you build.
 3 So that's the positive aspect of green.
 4 It's very much part of the proposals. I won't
 5 belabor too much, but as you can see, I kind of
 6 care a little bit about this. I got into civil
 7 engineering (inaudible) dig holes and put in
 8 concrete. I don't dig holes and I don't put in
 9 concrete in anymore, and it makes me a very happy
 10 person. So --
 11 MR. BISHOP: I have a University of
 12 Concrete T-shirt, so I set myself off.
 13 MR. ANDERSON: So this is the last
 14 slide. And I think the important thing here is,
 15 we've got the CSOs as they're currently outlined
 16 in our plan, but if you go to the right and at
 17 the bottom, what you will notice is the cost.
 18 Now, remember the conceptual design? And you've
 19 got to remember how these costs were generated.
 20 Because the conceptual designs were priced out
 21 based on current construction costs for a green
 22 infrastructure, and they've been aggregated up.
 23 So you're not going to get the economy of scaling
 24 things like that, so I accept that. But I think
 25 they're very indicative as to the kind of costs

1 here is that currently for these design
 2 conditions, we're doing just under
 3 57 million gallons. You can see the numbers
 4 there, the differences, but the important aspect
 5 to take away from this particular slide is in
 6 terms of CSO reduction. If you did an all green
 7 solution based on parameters we set out, so this
 8 is purely only green, not part of a program, it's
 9 just doing everything that's green, so a green
 10 program, I should say, you get a 36 percent
 11 reduction in current CSO. If you only did the
 12 public GSI as identified, you get a 10 percent
 13 reduction. So the message really is that it is a
 14 part of the program but by no means the program.
 15 And I know that's not a surprise to any of you.
 16 That's an interesting point, because, you
 17 know, as I say, there's a lot of cities out there
 18 doing some fairly aggressive GSI. And the beauty
 19 about GSI, unlike a tunnel or a series of
 20 interlocking storage boxes, you know, interspaced
 21 across the entire service area is that it's
 22 relatively short-term and so it's a little more
 23 pragmatic solution and offers you something a
 24 little different. You can do some early, you can
 25 hold it back, you can do some late. What it will

1 that I've seen around the country.
 2 At the moment, what we're looking at is if
 3 you did the public only GSI, you're going to be
 4 just over 300 million. That was a 10 percent
 5 reduction in CSO volume. If go to the full GSI,
 6 you're at just about 540, half a billion dollars,
 7 to get a 36 percent reduction.
 8 Now, obviously, those when you break them
 9 down per gallon have an interesting concept,
 10 because these are the numbers that are very
 11 important. As Rich goes through the gray, as we
 12 take this forward and we're talking about
 13 alternatives and getting your views on it, those
 14 two numbers in terms of public and full GSI in
 15 the bottom right-hand corner are all involved.
 16 Because they say \$48.01 per gallon and \$32.02 per
 17 gallon. That is for the extraction of a
 18 three-month storm. That is only for that design
 19 condition.
 20 So if you think about it, and for all of
 21 those who sort of looked on the Internet and have
 22 seen these big programs that are going on, and
 23 there are a lot -- Philadelphia, New York, huge,
 24 huge, yet they talk about cost per gallon of CSO
 25 reduction in 85 cents to 1.50. So you think,

1 Well, why are we at 48.32? Because they consider
 2 the reuse over the lifespan of the asset, and
 3 they used 25 years as a comparative lifespan. So
 4 what we're saying is, if you take the annual CSO
 5 scale over 25 years and you lump that little bit
 6 off each and every year and you aggregate that
 7 together, that gives you a cost of reuse.
 8 So when you read those numbers and they're
 9 around about anywhere between 75 cents to
 10 anything up to two bucks per gallon, we're
 11 probably operating under these conditions at
 12 about \$1.17. Right in the midrange, so very much
 13 applicable. And those programs are an awful lot
 14 bigger than this one because they're bigger
 15 places, bigger cities. They are taking a
 16 slightly more aggressive stance.
 17 MR. BISHOP: Again, just to understand
 18 the numbers, those are the costs for -- if I took
 19 the big, you know, the public/private, and then I
 20 assume that's the combination number at 540?
 21 MR. ANDERSON: Yes.
 22 MR. BISHOP: Right. And that is a
 23 36 percent reduction. So that doesn't
 24 necessarily meet the three-month storm, just to
 25 be -- okay. And, finally, I assume, maybe you

1 effectiveness.
 2 And we're saying here that in some cases
 3 green is the right thing to do because it's cost
 4 effective in comparison to an alternative. And
 5 in some cases, it's not quite as favorable.
 6 MR. BISHOP: Again, Brian Bishop. A
 7 slight technical -- I'm not missing -- there's
 8 not a comparison in this slide to reducing that
 9 same 36 percent with the hard infrastructure
 10 proposal.
 11 MR. ANDERSON: No.
 12 MR. BISHOP: No.
 13 MR. ANDERSON: No. So what we will see
 14 next -- and I will get off the stage because I've
 15 talked way too much. I should have gone to Las
 16 Vegas or something. But the point being that,
 17 just focus on those two numbers, so you're
 18 looking at 48 and 32 as an indicator, but what
 19 we're doing when we come to do the program, this
 20 is what we will talk about a little bit next
 21 time, is that green will fit in in terms of the
 22 overall program. We're not just going to force
 23 it in because it seems like a good thing, and
 24 we're not going to leave it out because it seems
 25 like the wrong thing.

1 have or maybe at the larger presentation, what
 2 I'd like to see is for the individual CSOs a
 3 comparison of those costs to the cost of
 4 others --
 5 MR. ANDERSON: So the reason it's being
 6 done, and I think the words you've been using, is
 7 it's an apples to apples analysis. So when Rich
 8 talks about the cost reduction associated with
 9 the gray, it's important that we consider them on
 10 the same level plane, and that is very important.
 11 What you will notice is if you scan the
 12 right-hand columns of all of them, as you will
 13 note, there's a wide fluctuation in terms of cost
 14 per gallon CSO reduction. We talked about the
 15 whys and wheres, the hydraulics and all that's
 16 associated with the system, but you do get a
 17 variable output.
 18 So, for example, if you take 107, you're in
 19 200 bucks a gallon for removal. Not to get too
 20 transfixed on that number, but it's a relative
 21 number. So if you take 202, for example, they
 22 have very, very different, you know, impacts. So
 23 it's almost a case -- and I think we talked about
 24 cost effectiveness a little bit earlier. And
 25 this is what this entire project is about. Cost

1 MR. REITSMA: And maybe you will get to
 2 this in that later stage, but you can compare
 3 simply in terms of cost, in terms of GSI on the
 4 one hand and hard infrastructure on the other
 5 hand? What about in terms of cost savings that
 6 one offers? For example, to what extent does GSI
 7 offer you the chance to lower the cost of hard
 8 infrastructure?
 9 MR. ANDERSON: So at this stage, when
 10 we're looking at the alternatives, (inaudible)
 11 what we'll do in the program is look at that. So
 12 you did the evaluation criteria, so all of the
 13 recommendations that you see are based on
 14 evaluation criteria as well as cost. In terms of
 15 O and M, there are certain solutions which we are
 16 not recommending because the O and M can be
 17 better served by something else.
 18 MR. REITSMA: One thing I would like to
 19 add to that, at the risk of, once again, being
 20 seen as a one-issue person, resilience,
 21 resilience, resilience. We're talking about
 22 building tanks and other infrastructure right
 23 next to rivers and inundation areas and what have
 24 you, and I just would like us to think about
 25 whether green infrastructure actually might be

1 something that not only could save you cost but
 2 actually could be more resilient in the longer
 3 term.
 4 MR. ANDERSON: The short answer is yes.
 5 Of course it's yes. But, you know, from my
 6 perspective, and I am getting off, honestly,
 7 there's a program to be delivered here.
 8 (Inaudible). In the long term, we've highlighted
 9 an awful lot of green infrastructure that won't
 10 be (inaudible). But that's not to say that that
 11 can't be part of the future resilience
 12 (inaudible). That does definitely offer you
 13 flexibility.
 14 It's very pragmatic, because it's disparate
 15 and small, it's relatively easy to implement, but
 16 there is a diminishing return on it. And that
 17 is, as part of this program, we have got to
 18 consider that but in a wider context we have to
 19 consider it. And that then looks to the future,
 20 as we're talking about a program, that lasts for,
 21 as Greg and John have done, for 12 years, but it
 22 also means there is a wider connotation.
 23 MR. REITSMA: I have to correct a
 24 possible misconception. People talk about
 25 resilience as something that you need to worry

1 Service and the state climatologist.
 2 MR. ANDERSON: I'm not disputing any of
 3 that, but what I'm saying is, in terms of the
 4 program is that we're trying to put together
 5 something to meet the need. If something is done
 6 outside of this program, then it could have a
 7 positive benefit. But there's only so much we
 8 can actually deal with. We hear about all the
 9 various costs and affordability, but the truth is
 10 that the program is going to be what we think is
 11 offering you the best as an overall, trying to
 12 cover as many bases as we can.
 13 MR. DOMENICA: Hold on one second.
 14 Nick, do you have one more slide?
 15 MR. ANDERSON: That's it. I will get
 16 off.
 17 MR. DOMENICA: We'll come back, Brian.
 18 MR. BISHOP: I just thought this was a
 19 downtime. I could start rattling on.
 20 MR. RAICHE: We have no downtime. I
 21 just realized that in past stakeholder meetings,
 22 I've put other presenters in the unenviable
 23 position of wrapping it up, and now I find myself
 24 having 60 slides to go through in half an hour.
 25 You have to remember for November 13th to put

1 about in the future. Part of that is that we're
 2 only talking about sea level rise, and some
 3 people talk about sea level rise as if that's
 4 only the next century. That's one misconception.
 5 The second misconception is that we're not
 6 talking only about sea level rise, but it's about
 7 increasing intensity of storms inland and inland
 8 innovation, which is already happening now. So
 9 I'm a little worried about people saying, Oh, we
 10 can deal with that later on.
 11 MR. ANDERSON: No. The thing at the
 12 moment -- the only thing about climate change
 13 predictions that are actually correct is that
 14 they're currently wrong. It's how wrong are
 15 they.
 16 MR. REITSMA: We have the predictions
 17 for you in Rhode Island.
 18 MR. ANDERSON: The point being, if we
 19 could predict the future, we wouldn't be here.
 20 But what I'm saying is, the flexibility of a
 21 program, when you're putting it together, needs
 22 to be the initial needs. And that's what we're
 23 doing.
 24 MR. REITSMA: We have the predictions
 25 for you in Rhode Island from the National Weather

1 somebody else in the hole here.
 2 That's just to say that there are a number
 3 of slides to get through. I will try to get
 4 through these, and maybe if we could hold some
 5 questions to the end, because we may answer them
 6 as we move along, unless there's something really
 7 blockbuster.
 8 So last month we looked at what the
 9 alternatives were on a subsystem by subsystem
 10 basis. Because we wanted to look at what the
 11 components of an overall Phase III plan would be.
 12 We discussed the evaluation criteria. We have 16
 13 evaluation criteria which includes resiliency and
 14 co-benefits and construction phase impacts and
 15 those things. The only thing we didn't have were
 16 the costs.
 17 So I'm going to speak first about what goes
 18 into the cost and what the cost of each one of
 19 these alternatives is. Then I'll wrap up with
 20 conclusions of the alternatives analysis, which,
 21 again, takes those 16 evaluation criteria and
 22 weights the alternatives against each other.
 23 So for sewer separation capital costs, we
 24 talked a little bit about this back in May. When
 25 we're talking about that, we're not just talking

Page 97

1 about the cost of putting in the new pipe to have
 2 a separate sewer system. We've got other
 3 ancillary costs that we build in here. We've got
 4 construction of the second set of pipes, but we
 5 also have the water main and gas main are going
 6 to be in our way, so we have to relocate them.
 7 We have to restore the surface roads when we're
 8 done. Often we have to do improvements, like ADA
 9 sidewalks. So we've got additional costs for
 10 that for the sewer separation. And the hybrid
 11 sewer separation, we essentially took those GSI
 12 costs that Nick just spoke of, subtracted out the
 13 areas where we can do GSI, and then we have the
 14 remainder sewer separation.
 15 One of our alternatives to the sewer
 16 separation for 039 and 056 is the West River
 17 interceptor. This, in one instance, provides
 18 some redundancy to the Branch Avenue interceptor,
 19 but more than that, it actually provides physical
 20 storage capacity along the horizontal length of
 21 that. So when we look at the cost associated
 22 with that, it's not just that pipe that we have,
 23 because that pipe follows the West River itself,
 24 we're going to have some riverbank restoration
 25 issues. So we captured those costs in the

Page 99

1 surface tank, you know, when we talk about the
 2 tunnel, we've got several things that are wrapped
 3 up in that cost. We've got the deep rock tunnel
 4 itself, a number of drop shafts, we have the pump
 5 station. Because, again, what we're doing is
 6 we're storing the CSO volume way down underneath
 7 the ground and then pump it back out after the
 8 storm is over and run it through the treatment
 9 plant. So we have a big pump station. We do
 10 have sewer restoration where we have the drop
 11 shafts themselves. So take all of those costs
 12 into account. That's supposed to be flashing so
 13 you see where the tunnel is.
 14 Then, again, we also have the areas where
 15 we've got disparate CSO locations that we're
 16 bringing to the centralized location. We've got
 17 our three main interceptors. Again, we've got
 18 utility relocations where we're doing our pits
 19 (sic) for our trench lists, installation of those
 20 sewers, we've got surface restoration, and all of
 21 that is (inaudible).
 22 When talking about the near surface tanks,
 23 there are a whole bunch of things that we need to
 24 put into these things to make moderately
 25 palatable for the neighborhoods for which they

Page 98

1 overall.
 2 So if you look back, again, because we've
 3 got a different category, we've got the sewer
 4 separation areas and the tunnel areas. So if you
 5 just look at the costs for those sewer separation
 6 areas, we find we have a little bit of
 7 variability on an area-by-area basis. And this
 8 makes a little bit of sense. As we said for 035,
 9 we already for most of that area have dual pipe
 10 network so that the cost for separating that area
 11 is relatively low. And we also have fairly tight
 12 soils and steep slopes through that area, so GSI
 13 is difficult. So when you look at those two
 14 together, Well, gee, just straightforward sewer
 15 separation in that area is a little bit more cost
 16 effective.
 17 We have a different story in 206. If we do
 18 the hybrid approach in 206, we can have some cost
 19 savings. And the other two, 35 and 56, it's a
 20 slightly different comparison. Combining 35 and
 21 56, we see that overall the West River
 22 interceptor costs less as an option than either
 23 the hybrid or the sewer separation.
 24 Moving on to the volume storage, which is,
 25 again, is either a deep rock tunnel or a near

Page 100

1 reside. We need some odor control, we need a
 2 discharge pump station, we need some
 3 consolidation conduits to bring them to the
 4 semi-centralized location. In the case of the
 5 sewer sheds for 201 through 205, that's an
 6 instance where we absolutely need to do GSI to
 7 get that volume down to a reasonable size so that
 8 we can actually utilize the Front Street tank for
 9 that volume. Those are inter-disbursed where we
 10 could find locations to put these. We've got a
 11 very densely developed city. It's very difficult
 12 to find sites for these.
 13 Last time we ran through these. But just as
 14 a quick refresher, the tanks we're talking about
 15 are High Street, which is beneath the little
 16 league and high school ball field in Central
 17 Falls, High Street, Webbing Mills tank, which is
 18 a private site which would take up the parking
 19 lot, the E Street tank, again, another private
 20 site using the parking lot, Front Street, which
 21 is currently a park and the City of Pawtucket
 22 would like to have some sort of other development
 23 there, but at the moment it is open and
 24 available, the City Hall tank, which would use
 25 the parking lot for City Hall, the public safety

1 building, the 2013 tank, it doesn't have a cool
 2 name like all of the other ones, which also uses
 3 a field along the Seekonk, the Tidewater tank.
 4 This is the one that Tim spoke about last month.
 5 That would be an above ground tank, because we're
 6 dealing with a contaminated site, a known
 7 contaminated site. It's somewhat insulated from
 8 residential areas. Rather than below ground, we
 9 could conceivably do an above ground to avoid the
 10 contaminated soil. The Buckland Point tank,
 11 which is south of 218 just above the treatment
 12 plant at the old landfill site, and, finally, the
 13 Morley Field tank, and this is our one for 2020
 14 on the Moshassuck, also a Little League field.
 15 So in all of the instances here, we have
 16 existing uses. The tank itself would be below
 17 grade. We would have a surface building in
 18 perpetuity, you know, like an equipment building
 19 that we would need to house associated with each
 20 one of these things. But, generally, they're
 21 below grade tanks, so the surface use could be
 22 restored after construction. So if you have a
 23 ball field, we could put back a ball field over
 24 the tank. A parking lot, the same.
 25 The real impact comes during the

1 that has to do with consolidation, conduit, exact
 2 locations. Some of it has to do with known
 3 contaminated soil that we have to deal with.
 4 There's some things built into those costs that
 5 give us some variability from site to site.
 6 MR. BISHOP: Can I ask, I was a little
 7 confused by the way this table is laid out, am I
 8 to assume that on the top you're including some
 9 proportional cost of the tunnel itself rather
 10 than just the drop cast to get to the tunnel?
 11 MR. RAICHE: Correct. So for all of
 12 these and the ones on the next table, because the
 13 tunnel is a holistic solution -- we said right
 14 out probably at our kickoff, if not our grade
 15 meeting in April, that a tunnel is a centralized
 16 solution that is shared by a whole number of
 17 outfalls. That's what makes it cost effective.
 18 So to do this subsystem-by-subsystem analysis, we
 19 parsed out the tunnel cost by subarea based on
 20 volume of flow from each subarea.
 21 MR. HILL: Lance Hill, City of
 22 Pawtucket. Just for clarification, the million
 23 gallons that you have listed there, is that
 24 million gallons per event? Is that million
 25 gallons annualized?

1 construction phase, which could last two to three
 2 years, during which time your ball field or
 3 parking lot would have to find another location
 4 during that use, which is exceptionally difficult
 5 in these denser areas. We did -- Central Falls
 6 and Pawtucket did both express reservations about
 7 use of the -- particularly the ball fields.
 8 They're both densely developed communities that
 9 do not have much in the way of open space or
 10 recreational land available, and to take those
 11 out of service for two to three years would be
 12 problematic to the communities.
 13 So then what we look at in terms of adding
 14 all these things up, and I put them into two
 15 different categories, we've got the category of
 16 subsystems that could tie directly to the tunnel.
 17 These are along the tunnel route near the drop
 18 shafts. And what we see is that on average for
 19 those ones is that we've got about \$10 per gallon
 20 on average to handle the volume in the tunnel.
 21 Compare that with \$14 per gallon for the near
 22 surface storage. We see that on the cost
 23 effectiveness, the tunnel is slightly more cost
 24 effective than the tanks.
 25 There is variability site to site. A lot of

1 MR. RAICHE: This again -- all of the
 2 numbers, including the numbers that Nick showed
 3 for the green, these are the volumes during the
 4 three-month storm, which we agreed are baseline
 5 for comparing alternatives. This isn't annual
 6 volume treated, which is why -- something like 40
 7 bucks. If you hear other numbers, that's why
 8 these numbers are a little different. We use
 9 that as a baseline to compare the alternatives.
 10 When we need to use interceptors to get the
 11 disparate areas to the tunnel, it makes sense
 12 that our costs go up. To sort of capture those
 13 on average, it's almost \$17. But you will see,
 14 as I sort of tipped off earlier, the one for the
 15 Pawtucket Avenue interceptor is significantly
 16 more expensive than the other ones, the High
 17 Cross interceptor and the Middle Street
 18 interceptor. That is largely due to partially
 19 the length, to get across from central Moshassuck
 20 over to Seekonk, but also the fact that the route
 21 for that is heavily trafficked and a difficult
 22 construction zone when you compare it to, say,
 23 Middle Ave., which comparatively isn't as
 24 difficult.
 25 Again, when we look at that on average, the

Page 105

1 tunnel and the tanks become competitive, but that
 2 is really thrown off because the Pawtucket Avenue
 3 interceptor versus the Morley Field tank is
 4 really where that difference is. If you look at
 5 the other tanks, the tunnel comes out more cost
 6 competitive.
 7 As Harold pointed out earlier, we have a
 8 third alternative for 2020, which would be the
 9 stub tunnel. The Morley Field tank has a low
 10 cost associated with it, but it is a limited
 11 installation, one, it has the impacts on a little
 12 league field, so on the co-benefits and
 13 construction phase impacts, it has -- it is a
 14 problematic site.
 15 Two, building the tank at that location, we
 16 can really only accommodate the 220 flows. We
 17 know we have other problems in the system.
 18 Namely, the Branch Avenue interceptor problems.
 19 We could conceivably help solve the Branch Avenue
 20 interceptor SSO problems in the future with the
 21 220 stub tunnel. There would be additional
 22 infrastructure that would need to be built to
 23 connect the Branch Avenue system to the 220
 24 system. But if we did that additional, we've got
 25 flexibility and resiliency to cross-connect the

Page 106

1 two systems. So there's other criteria in here
 2 other than cost that make the tunnel an
 3 attractive alternative to what is apparently a
 4 cheaper near-surface storage tank option.
 5 MS. KARP: I have a question about this
 6 220, which is on the Moshassuck. It looks to me
 7 from the map as though there is -- on the
 8 Pawtucket side of the river, there's a bunch of
 9 abandoned mill buildings with parking lots in
 10 addition to the old landfill site. If you go to
 11 the other side, across the river, you have the
 12 rail yards, and there's a lot of open space over
 13 there. Because this whole river has been
 14 engineered anyway, did you look at the option of
 15 going -- basically diverting that whole flow
 16 across the river toward the rail yards and making
 17 use of that storage area that exists over there?
 18 MR. RAICHE: To answer the parking lot
 19 issue first, they are currently privately owned
 20 and they do have uses. It's not terribly
 21 frequent in nature, but there are uses on those.
 22 Moreover, there are plans to expand the use of
 23 it. It's one of the art districts and --
 24 MS. KARP: This could be
 25 subterranean at any --

Page 107

1 MR. RAICHE: Correct.
 2 MS. KARP: -- rate. So those
 3 properties look, by and large, vacant and
 4 abandoned, even though there are a few trees at
 5 present. And it looks as though there's
 6 relatively inexpensive use. I'm curious about
 7 the alternative to look at around these prices.
 8 Because Morley Field looks unpractical
 9 (inaudible).
 10 MR. RAICHE: There would be some cost
 11 flexibility in there. The tank itself has sort
 12 of a fixed cost, but the surface restoration
 13 costs --
 14 MR. BRUECKNER: I just want to talk
 15 about that for a minute. When we've done other
 16 projects and we've been on private property and
 17 tanking the property, it is a severe impact. You
 18 might not think so, but you essentially are
 19 messing up somebody's business. And we have, on
 20 occasion, had to pay costs for them doing
 21 business during the time of construction. So
 22 while it seems on the surface that it shouldn't
 23 be such a difficult thing, it actually is much
 24 more.
 25 MS. KARP: Absolutely. I live near

Page 108

1 there, but these look like vacant and abandoned
 2 properties. These are not thriving, active
 3 businesses. These are kind of rundown businesses
 4 along the rail lines around the Moshassuck. So
 5 to me, it's a question of, we're looking at urban
 6 renewal at the same time, so this seems to me
 7 like an opportunity not just to capture this very
 8 large CSO so it drains to the Moshassuck, but
 9 also to look at that area around it and what
 10 would it take to make this a better neighborhood
 11 for the people who live there.
 12 MR. BRUECKNER: Actually, where 220 is,
 13 it's essentially an industrial neighborhood and
 14 very few residential houses in that area. And
 15 most of those businesses are actually going
 16 concerns that are quite successful, around the
 17 vicinity of 220. On the other side of the river,
 18 we have to get over to the other side of river,
 19 you have a highway, that you have to get under,
 20 and you have the rail yards. You cannot do
 21 anything near a railroad. Impossible. So to say
 22 that there's room on the other side of the river,
 23 I don't see that.
 24 MS. KARP: Okay. That's what the
 25 zoning maps show, though.

1 MR. RAICHE: One thing that railroads
 2 never do is relinquish real estate.
 3 MR. BISHOP: It's not my favorite
 4 domain -- it's not my favorite topic and I'd have
 5 to put my lawyer's hat on to understand whether
 6 certain federal transportation would somehow
 7 prevent an agency empowered to accomplish this,
 8 you know, to tell the railroads how it's going to
 9 work rather than vice versa. And I don't say
 10 that lightly, at all. I understand that's the --
 11 I think -- it may be a point I think Caroline is
 12 making, is not that you haven't thought of it but
 13 that you've taken relatively standardized
 14 solutions to cabin where this is going to go, it
 15 then presents as interfering with a ball field
 16 that is this rare piece of open community space
 17 in this area, and that becomes a negative, you
 18 know, along with some other possible
 19 infrastructure surfaces to an interceptor to say
 20 that spending twice as much is a good idea. And,
 21 you know, I think that she's reasonably skeptical
 22 about what really went into that.
 23 MS. KARP: I just think if this were
 24 looking at a (inaudible) in particular.
 25 MR. RAICHE: The Morley Field site,

1 here.
 2 MR. RAICHE: We did pull together some
 3 costs associated with the screening disinfection.
 4 Knowing that this is not -- not only is it not an
 5 apples-to-apples comparison, it's probably not
 6 even a fruit-to-fruit comparison because of how
 7 it measures against the Clean Water Act in
 8 obtaining the water quality goals, but, you know,
 9 as we did say, perhaps it is an interim solution
 10 that could be implemented if affordability pushes
 11 the long-term solutions off the table for a
 12 while.
 13 And so that brings us to integrating the
 14 costs with the analysis that we did last month
 15 against the 16 criteria. I've got a couple more
 16 slides here. I'm sorry. I ran ahead.
 17 These are graphical representations of those
 18 numbers that I just showed you. And perhaps it
 19 would have been better to show you the graphs
 20 upfront instead of the tables. But it does show
 21 a couple of interesting things. Each grouping is
 22 for one of the subsystems, and each one of the
 23 colored bars are the different solutions. So for
 24 20 --
 25 MR. DOMENICA: What's the vertical

1 although the other criteria is against it, would
 2 present the lowest cost tank for that region.
 3 Other locations, if they could be made to work by
 4 agreements with property owners, would have a
 5 higher cost associated with them but maybe score
 6 more favorably against a few of the other
 7 criteria.
 8 MR. BISHOP: I'm going to finish that
 9 by, I mean, the kind of box I think is, how about
 10 we build a bridge and put the ball field on the
 11 other side of the river while they're working. I
 12 don't think that would actually cost a lot of
 13 money. And, ultimately, if faced with, you know,
 14 some constant infrastructure there as a possible
 15 alternative, the railroads might think it would be
 16 great to have the Providence and Worcester Little
 17 League team.
 18 MR. RAICHE: All right. In the
 19 interest of trying to get through a few more of
 20 these slides, we're championing on. We did also
 21 develop a cost of screening for disinfection at
 22 the beginning of this meeting, which was about
 23 three hours ago, but it seems longer. We
 24 discussed the caveats --
 25 UNIDENTIFIED SPEAKER: Try sitting

1 access?
 2 MR. RAICHE: The vertical access on
 3 this one is millions of dollars. So for 205, for
 4 example, which is 201 through 205, the orange bar
 5 here, that's the Front Street tank cost. And
 6 because it's a constrained site, we have to go
 7 very deep with that tank and we have to do a
 8 bunch of GSI to make that even remotely feasible.
 9 What we see is that it's a very high cost
 10 compared to the blue bar, which is the deep rock
 11 tunnel.
 12 Where we've got this sort of light blue,
 13 that's where we've got the interceptor to the
 14 tunnel. And you can see that for the Central
 15 Falls one. These two probably should have been
 16 added together. It's not really an accurate
 17 representation of the system. But if you look at
 18 the High Street tank and the Webbing Mills tank
 19 together, those two put together are more costly
 20 than the tunnel and interceptor solution.
 21 MR. BISHOP: Can I ask -- Brian Bishop.
 22 Can I ask on the dark blue lines, are those
 23 created because the tunnel pushes across five
 24 subgroups there, not counting the tunnel with
 25 interceptor, are those calculated on the

1 percentage of the overflow that those would
2 represent as in V (phonetic) to the tunnel?
3 MR. RAICHE: Yes.
4 MR. BISHOP: Thank you.
5 MR. RAICHE: This is just for means of
6 comparing alternatives at each one of the sites.
7 One other thing to note is that the sewer
8 separation or hybrid costs, as overall projects,
9 come in fairly low compared to the tunnel.
10 Obviously, which we know the tunnel has a high
11 cost associated with it. But when we look at
12 cost per gallon, the sewer separation and the
13 hybrid sewer separation comes out a lot more
14 expensive.
15 This is another reason why, for the large
16 scale applications in Pawtucket and Central
17 Falls, which is why we sort of steared towards
18 storage rather than sewer separation.
19 MR. BISHOP: One thing I think would be
20 very important in the future in looking at these
21 graphs is, not precisely because we can look at
22 the map, but largely, those are the subgroups
23 that have the dark blue lines, if we accepted the
24 tunnel, forgetting what the project streaming
25 would be, I think we really almost have to have a

1 the O and M costs, we could go through them, but
2 in general, the tunnel is less costly than the
3 tanks because we have a number of disparate
4 locations to worry about and odor control
5 facilities as opposed to essentially one pump
6 station. And we have some O and M costs worked
7 up for treatment, which are higher still, because
8 there's more complex to operate and maintain than
9 the other options. We've got chemical and power
10 costs and labor and equipment costs.
11 So for the 3956 system, again, we've got our
12 options of hybrid, sewer separation, and West
13 River. And this is, again, looking at our 16
14 evaluation criteria. What scores out the best is
15 the West River interceptor. It compares better
16 than its alternates on operational costs -- on
17 capital costs and operational flexibility, as
18 opposed to sewer separation allows us to balance
19 some flows.
20 Also, it has a higher reliability compared
21 to some of the others. Not to say the hybrid had
22 something in its favor. It did have co-benefits
23 in its favor. But on balance, the West River
24 interceptor comes out higher. Sewer separation
25 is probably the least favorable with the

1 combination of those subsets to view, you know --
2 there might be a couple of scenarios of what the
3 alternatives would be, because the alternatives
4 could be bifurcated, but I don't think the tunnel
5 really could be bifurcated as an approach or
6 multi-forcated (sic).
7 MR. RAICHE: The components of the
8 tunnel that could be bifurcated are the
9 interceptors associated with it and perhaps a few
10 drop shafts. But --
11 MR. BISHOP: That's what I'm talking
12 about. The dark blue.
13 MR. RAICHE: But to start at the end
14 point of the tunnel is a --
15 MR. BISHOP: Right. So I'm just saying
16 that while this is interesting in subgrouping, I
17 think realistically when we consider the tunnel,
18 we need you to put those -- I mean, I can do it
19 if I take a --
20 MR. RAICHE: Yes. That is what we need
21 to do in November.
22 MR. BISHOP: And I won't be here, so
23 I'll have to count on Caroline and Jan to hold
24 down my --
25 MR. RAICHE: The other component with

1 construction phase disruptions (inaudible) being
2 talked about associated with sewer separation.
3 For the 35 system, this is where we already
4 have dual pipes. The sewer separation comes out
5 as favorable. Again, we've got capital costs
6 because of the dual pipe system. We know it's
7 reliability. It does score poorly on
8 construction phase disruptions and the sewer
9 separation pieces and it lacks the co-benefits of
10 the hybrid, but on balance, it would come out
11 more favorably.
12 MS. KARP: I just have a fast question.
13 The two projects you just looked at, the two
14 subsystems, the total CSR flow in these two areas
15 look like they may make up 5 percent of the total
16 that we're looking at. And I say this because it
17 seems to me, if we were going to do this, again,
18 in my view, reasonably, we'd look at the biggest
19 problems first.
20 MR. RAICHE: So just as a point of
21 clarification, what we embarked upon last month
22 and this month is the subsystem alternatives
23 analysis to determine the components of the
24 overall plan that makes sense in each one of
25 these geographic regions. Once we nail those

1 down, then the focus of the next meeting is to
2 sequence those projects based on affordability
3 and water quality benefits. I completely agree
4 with you that these ones in comparison to the
5 others are trivial. And, actually, the baseline
6 case that was presented by Jon and Greg in terms
7 of project sequencing, frankly, I'd put the sewer
8 separations at the tail end anyway, because the
9 tunnel is the one that gets the most. So that
10 sort of thinking is more programmatic than
11 alternative analysis.

12 MR. REITSMA: Would you, one more time,
13 refresh my memory as to what the co-benefits are
14 with reference to these two?

15 MR. RAICHE: The co-benefits is a
16 measure of the improvements to the community, to
17 the neighborhoods based on doing these things.
18 So if we're saying that we're going in and doing
19 some sewer separation and we're going to improve
20 the roadway and we're going to do some GSI in
21 that neighborhood and put in some trees and
22 things like that, those are the co-benefits.

23 MR. REITSMA: Not internal to the
24 project?

25 MR. RAICHE: Those are ancillary

1 the fact that with the tunnel you have
2 centralized control of how that's operated. With
3 the tanks, they're out further away out of NBC's
4 control. They're more difficult to operate and
5 gives you less flexibility in how you operate
6 those.

7 In addition to the things that are favorable
8 for the tunnel, the things that are unfavorable
9 for the Front Street and E Street tanks, are,
10 again, we come back to the constructibility at
11 the construction phase risks. If we've got
12 contaminated soils or suspected contaminated
13 soils, once we start digging deep in those
14 locations, that could be something that escalates
15 the cost further. So we have some significant
16 construction phase risks. We have construction
17 phase disruptions, because these are possible
18 existing uses that would be disrupted during
19 construction. And, again, operational issue
20 impacts.

21 One thing to carry forward and consider is
22 that we could do screening and disinfection at
23 this location. The positive benefit is that it
24 could derive interim water quality benefits.
25 While not fully compliant with the Clean Water

1 benefits to the neighborhood. 206 is the
2 opposite conclusion where the hybrid actually
3 comes out cost competitive, plus it has those
4 additional co-benefits. It allows some
5 operational flexibility. Because the preliminary
6 we've done for GSI in that area includes some
7 stub water tanks, which give us some -- we can
8 operate those with some additional benefits.
9 Sewer separation. You know, while perhaps
10 it's a little bit more reliability than some of
11 the GSI, it still scores out less favorably than
12 incorporating GSI into that particular solution.
13 Moving onto the 201-205 area, the Front
14 Street tank along the Blackstone River. As our
15 alternative, we've come out to the conclusion
16 that the Pawtucket tunnel is the preferred
17 alternative. As we start sifting through these
18 near surface storage versus tunnel, most --
19 almost all of these have the same conclusion,
20 that the capital and O and M costs follow
21 favorably for the tunnel solution versus then
22 near-surface storage.
23 We've got administration and institutional
24 considerations, as well as system reliability and
25 operational robustness. A lot of that comes from

1 Act, it is better than nothing if the long-term
2 solution has to be delayed due to affordability.
3 There are a number of negatives. The operations
4 and construction phase impacts are substantial.
5 The other thing to consider in terms of cost
6 is that for this site there are no recoverable
7 systems. So if you put in the interim a
8 screening disinfection facility at this site and
9 then you put in the tunnel as the long-term
10 solution, there's nothing there that you could
11 reuse or sell.

12 MR. BISHOP: I hear chlorine is big on
13 the black market. Brian Bishop. I was
14 wondering, and this might be in Tom's wheelhouse,
15 while I can understand the idea of reliability --
16 modest reliability constraints related to more
17 disparate if even relatively large industrial
18 facilities comparing these near-surface tanks to
19 the tunnel, I'm not sure I precisely -- quite
20 understand the flexibility constraints or the
21 extent to which -- I guess what you're saying is
22 you can only pump into the existing interceptors
23 at a certain speed, maybe you could build
24 yourself a little more flexibility --

25 MR. RAICHE: A lot of the flexibility

Page 121

1 has to do with the constraints on the existing
 2 interceptor system. Because the tunnel
 3 essentially becomes a tunnel conduit. From the
 4 disparate locations down to the Buckland Point
 5 treatment plant, you're going to have operational
 6 flexibility on how you balance the tunnel
 7 operations versus the treatment plant operations.
 8 With the disparate locations, because so much of
 9 the CSO is dependent on limitations in the
 10 existing interceptor system, you don't have that
 11 flexibility.
 12 MR. BISHOP: But just to continue,
 13 that's really relative to once you collected the
 14 CSO, it's relative to the pace at which you
 15 determine to treat it, perhaps in anticipation of
 16 other weather. In other words, there's some
 17 fixed rate at which you can withdraw this from
 18 these out-area tanks given the limits of your
 19 interceptor. Compared to, you may actually have
 20 the capacity to treat it. On the other hand, if
 21 you assume that you have both the tunnel and a
 22 surface tank or two, it's plausible to balance
 23 the operation of those to kind of limit those
 24 flexibility constraints.
 25 MR. RAICHE: We could build more stuff

Page 123

1 potentially additional water quality benefits,
 2 because the level of treatment is more
 3 sophisticated than what we talked about
 4 elsewhere.
 5 MR. DOMENICA: Brian, let's hold off.
 6 We're already over time.
 7 MR. RAICHE: One last distinguishing
 8 point between this and 205 is that conceivably
 9 this isn't all wasted infrastructure. By putting
 10 in this interceptor in the interim condition, you
 11 could move the drop shaft location to the end of
 12 this interceptor, which would be very close to
 13 the fence line of the Buckland Point treatment
 14 plant which you would have benefits there.
 15 So now we're moving to the interceptors.
 16 The Webbing Mills tank, a very problematic site,
 17 much like the other ones. So, again, even though
 18 you have some additional costs associated with
 19 the interceptor, it still scores out very
 20 favorably based on cost and other considerations
 21 the High Street tank, the same story. We have --
 22 on this one the capital cost is essentially a
 23 push, and the other criteria rank out favorably.
 24 Then we come to our problematic site on the
 25 Moshassuck, 220. And this particular site could

Page 122

1 and have lots of flexibility. The City Hall tank
 2 is an extremely problematic site. Again, we
 3 steer towards the Pawtucket tunnel. While the
 4 City Hall tank is a relatively small and shallow
 5 one, it's cost competitive to build that tank
 6 versus a drop shaft. There are a number of
 7 knocks against it. And, frankly, the capital
 8 cost difference isn't all that big.
 9 The 213 tank, and this is going to be the
 10 same for almost all the rest of the tanks, the
 11 capital costs and O and M costs come up favorably
 12 for the tunnel versus the tank. And then the
 13 tank, we've got disruptions. Tidewater, same
 14 story. And the Buckland Point tank is a similar
 15 story.
 16 Again, we have a secondary option here for
 17 an interim alternative. Rather than actually
 18 doing screening and disinfection at 218, it would
 19 be plausible to build an interceptor from 218
 20 down to the Buckland Point treatment plant and
 21 accommodate that flow through that treatment
 22 plant's wet weather facility, which actually
 23 would give you -- we'd have to study it and
 24 figure out what the headroom is in the plan, but
 25 it would give you some even additional --

Page 124

1 be up for debate, but there are other benefits
 2 and impacts to mitigate.
 3 Generally, if you look at all of the
 4 criteria, the 220 stub tunnel comes out as, at
 5 least in the current configuration of the
 6 weighting criteria, the recommended alternative.
 7 Because it gives us that operational flexibility
 8 plus system reliability. O and M costs are
 9 lower, and we know who's going to operate it, NBC
 10 as opposed to some difficulty with a tank in a
 11 disparate location.
 12 The Morley Field tank is apparently less
 13 costly, but it does have some significant
 14 construction phase disruptions.
 15 What we want to do is eliminate here the
 16 Pawtucket Avenue interceptor as far as
 17 centralized storage, that additional cost
 18 associated with the cross-town interceptor. So
 19 that eliminates that alternative. Again, here,
 20 similar to the 205 location, we could conceivably
 21 do screening and disinfection. This would be
 22 incompatible with a Little League field in the
 23 long term, so maybe the Little League site is not
 24 the best site for screening and disinfection.
 25 Alternatively, if we use the Morley Field site

Page 125

1 for screening and disinfection, we would have to
 2 find a different location to have a ball field,
 3 because you don't want kids playing around a
 4 storage building with chlorine and moving vets
 5 (sic), but still something to carry through on
 6 our larger analysis.
 7 So then, again, the GSI, the other
 8 conclusions that we draw are the GSI
 9 prioritization. If you look at the graph that
 10 Nick had up here and you recall from the previous
 11 presentation that sometimes the CSOs are
 12 interceptor driven because of upstream flows or
 13 downstream constraints more so than (inaudible)
 14 where the GSI gives you a benefit. We have a
 15 couple of different ways of looking at where GSI
 16 fits in the best.
 17 So we've got GSI for system optimization,
 18 and based on our analysis, we have a number of
 19 sewer sheds where we know that falls in. And
 20 then we also have GSI for early cost effective
 21 water quality gains. Again, if we're going to
 22 defer construction of some of the larger gray
 23 pieces, we could do some -- start embarking on
 24 GSI programs in those sewer sheds and start to
 25 reduce CSO discharges. Again, we don't get to

Page 126

1 100 percent. We get to maybe 30 percent at max,
 2 but it's a 30 percent reduction before we get the
 3 full scale.
 4 Then the other conclusions -- we do have a
 5 number of sewer sheds where we know that GSI
 6 isn't terribly affected. A lot of this has to do
 7 with poor opportunity. These are areas with
 8 tight soils or steep slopes where we're not going
 9 to get any bang for our buck, where construction
 10 is difficult, or it's simply not (inaudible). So
 11 in terms of putting together a program, you know,
 12 every year you have your annual review and your
 13 goals, and there is always stuff you're supposed
 14 to be doing more of. I always like to hear about
 15 the stuff we have to do less of so we can do less
 16 there.
 17 So our conclusions. We have conclusions for
 18 the revised components in the sewer separation
 19 area. This is a mix of the West River straight
 20 sewer separation and hybrid, we've got the
 21 revised conclusions that -- terribly revised
 22 conclusions that the Pawtucket tunnel needs to be
 23 a marquee component of Phase III, and then we've
 24 got GSI factored in here under those two
 25 different categories I just mentioned.

Page 127

1 We do have a couple of areas that we need to
 2 study a little more. We'll advance those for
 3 November, the study of the stub tunnel versus the
 4 Morley Field tank. And we also have the
 5 consideration of interim water quality benefits
 6 from a couple of these treatment options.
 7 So how are we going to do this for November?
 8 We have completed, if you remember from the
 9 beginning of this process back in November, we
 10 have resurrected the water quality model that was
 11 used during the previous planning phase. We
 12 updated that and recalibrated it for current
 13 conditions, including post Phase I and
 14 anticipated benefits from Phase II, plus other
 15 things that have happened in these sewer sheds,
 16 like the upgrade to the Blackstone Valley Plant
 17 in Worcester.
 18 We have run the models. These are just sort
 19 of examples of, you know, essentially the outputs
 20 from that for post Phase II. It gives us an idea
 21 of where water quality impacts are over time. So
 22 this first one is right after the initiation of a
 23 storm, this is a couple of days after the storm,
 24 and we see how the plume moves.
 25 What we will do between now and November is

Page 128

1 run this through a couple of different scenarios.
 2 And this is exactly to Caroline's point. To help
 3 inform, Hey, instinctively those sewer separation
 4 areas are small, so do they have water quality
 5 benefits? And 220 is one of the real interesting
 6 ones, because moderately large but on a small
 7 water body, comparing the Moshassuck to the
 8 Seekonk. So we're essentially using it for
 9 sensitivity analysis to determine what gives us
 10 the most benefit.
 11 So what we will be doing is putting together
 12 these pieces. We come to the conclusions for
 13 almost all of the subsystems what Phase III
 14 should physically entail. And now we're piecing
 15 them together, looking at the water quality
 16 benefits, looking at affordability, and
 17 determining, A, in what order should we do these
 18 things, and, B, what the compliance deadline
 19 should be to maintain affordability.
 20 Again, we've got these outstanding questions
 21 which I've already sort of touched on. And these
 22 scenarios that we're testing over the next couple
 23 of weeks are designed to test those questions.
 24 Mr. Moderator.
 25 MR. DOMENICA: Very good. Thank you

1 very much, Rich. How about two questions, and
 2 then -- three questions, and then we will break.
 3 We're already over time.
 4 MR. HAMBLETT: Topher Hamblett, Save
 5 the Bay. I just want to, after all of this, pick
 6 up on something that Jan had mentioned earlier.
 7 We know that whatever the solution is it's going
 8 to cost a lot. And there are a lot of great
 9 minds in this room, but I would say that they are
 10 operating in a limited framework here in terms of
 11 assuming the rate payer is going to pay for it
 12 right now, and assuming that the Clean Water
 13 finance agency will assist to a certain level.
 14 I think a couple of things. One, we are
 15 about to have a new Governor and a new treasurer
 16 in our State, and I think this needs to be
 17 brought to their administrations on November 5th.
 18 MR. GAGNON: I second that.
 19 MR. HAMBLETT: There are also around
 20 the country with green infrastructure and gray
 21 infrastructure and CSOs, there are cities and
 22 states that are doing things in very different
 23 ways, and I think we need to bring that kind of
 24 horsepower to this table. So I would -- I think
 25 that we should enlist or encourage the new

1 and Cranston are largely responsible for that
 2 plume. They have three sewerage systems on the
 3 Pawtuxet River, they also have failed septic
 4 systems, cesspools, they have storm water runoff
 5 that is causing a problem. Even if we fix the
 6 Providence, Central Falls, Pawtucket problem and
 7 no one addresses the Pawtuxet River problem, we
 8 still have a statewide problem. And we need
 9 to -- I understand this is a Narragansett Bay
 10 Commission. I get that. But as a shell
 11 fisherman, I'm looking at Narragansett Bay as a
 12 whole; not just the Providence River system.
 13 And we have a greater problem, and it is a
 14 statewide issue. I agree with Topher. We need
 15 to bring in money from -- I mean, Newport
 16 benefits. The Newport restaurants and all of
 17 that benefit from -- when Narragansett Bay's
 18 reputation goes up, will people want to come to
 19 Rhode Island and eat in the restaurants? They
 20 benefit.
 21 MR. DOMENICA: We have to move on.
 22 MR. HOLMES: But that -- do you know --
 23 that's what I'm trying to get on. I agree with
 24 Topher. We need -- and November 5th is a good
 25 date to start on this on a statewide level.

1 administration to help us do that, because I
 2 think -- I mean, the rate, the rate projections,
 3 the rate increase projections are staggering, but
 4 we need to proceed with the cleanup of
 5 Narragansett Bay. So let's not limit ourselves
 6 in our thinking and in our expertise here. And
 7 I'm calling NBC and everyone else here to help
 8 press for more resources at the table here so we
 9 can do this right.
 10 MR. HOLMES: Real quick. Could we go
 11 back one slide, please? My name is Philip
 12 Holmes. I'm with the Rhode Island Fisherman's
 13 Association. Could we go back one slide, please?
 14 That's the one. We have a statewide problem, and
 15 we're talking about a locality solution. We're
 16 talking about Providence, Pawtucket, Central
 17 Falls CSO overflows. We have a plume on the
 18 western side of the river coming out of the
 19 Pawtuxet River, a separate plume separate from
 20 the Narragansett Bay Commission problem. This on
 21 the western side down a little bit. Right there.
 22 That's the one.
 23 That is an equally dangerous problem to the
 24 shellfishing industry. It's a statewide -- we
 25 need -- it's a locality -- Warwick, West Warwick,

1 MR. DOMENICA: We're already over time.
 2 One more comment.
 3 MR. WALKER: Mike Walker from Commerce
 4 Rhode Island. Thank you for the analysis of
 5 affordability and taking it to the next step
 6 beyond 1997's framework. However, I'm a little
 7 disappointed that there was no discussion in
 8 there on affordability on the nonresidential
 9 side, as well. When we talk about median
 10 household incomes, determining whether or not
 11 something is affordable, we can't lose sight of
 12 the fact that that income comes from a place
 13 called a job, and if the job isn't here, it drops
 14 dramatically.
 15 So if we just worry about the residential
 16 consumer paying the frame and not worrying about
 17 what the business has to pay and look at the
 18 rates the businesses are paying today versus
 19 residential, does it make up 40 percent of the
 20 expense at a higher rate, then I think we're
 21 missing something.
 22 I also want to applaud the fact that you
 23 have started to take a look at layering the cost
 24 and not just the cost of the CSO but what some of
 25 the communities should be or may be or may be not

1 be doing as it relates to their sewer
 2 infrastructure that's aging in place and not
 3 being maintained as well as their storm water.
 4 Because all too often we hear discussions about
 5 runoffs.
 6 I will give an example of an enterprise fund
 7 for a storm water utility district, and it's only
 8 going to cost X to the rate payer. Well, that's
 9 also on top of that chart we just saw today, but
 10 that's not part of the discussion, because we can
 11 approve a runoff and a runoff, and all of a
 12 sudden we're ten-off. So we need to think
 13 comprehensively when we're looking at these rate
 14 structures and solutions and not just what our
 15 particular vent is that we're advocating for. I
 16 will stop there.
 17 MR. BRUECKNER: I just wanted to
 18 comment. If you have not signed in on the
 19 sign-in sheet, could you do so before you leave?
 20 We'd like to keep an accurate record of who
 21 attended the meeting.
 22 MR. LIBERTI: I'm sorry. But if we
 23 could go back real quick. Could someone --
 24 (INTERRUPTION BY THE COURT REPORTER)
 25 MR. LIBERTI: I'm sorry. Angelo

1 bad, and the greens are somewhat impacted. I
 2 don't think the greens even -- anything --
 3 MR. ANDERSON: It's more of an example
 4 of the indicative of the model. Don't get too
 5 hung up on the results, because there's certain
 6 loading which aren't actually shown here. But
 7 it's just to show, there's a water quality model
 8 that's helping shape this program. I think we
 9 just wanted to demonstrate the fact that in
 10 addition to the costs, there are many other
 11 considerations that are going on. So this is
 12 being used as part of that program.
 13 MR. DOMENICA: Tom, did you want to --
 14 MR. BRUECKNER: No. I just wanted to
 15 make a comment about the sign-in sheet, and just
 16 to remind you that the meeting is at 9:00 next
 17 time, the 13th. It might only be an hour. Brian
 18 Bishop is not going to be here.
 19 (MEETING ADJOURNED AT 12:13 P.M.)
 20
 21
 22
 23
 24
 25

1 Liberti. Could someone just explain what this is
 2 we're looking at? I assume this is a model
 3 prediction under some storm condition? I don't
 4 think that was explained. I don't want people to
 5 leave taking this as --
 6 MR. RAICHE: This is not data. This is
 7 model output for post Phase II. This is the
 8 recalibrated model using the data that we
 9 collected in the past 14 years, since the last
 10 time the model was calibrated. And this is the
 11 output.
 12 MR. LIBERTI: Two different design
 13 storms?
 14 MR. RAICHE: No. It is the same storm,
 15 a three-month storm, but it's two different time
 16 steps. This is just a couple of hours after the
 17 start of the storm, and this is a couple of days.
 18 UNIDENTIFIED SPEAKER: Could you say
 19 what the colors are?
 20 (INTERRUPTION BY THE COURT REPORTER)
 21 MS. KURT: Meg Kurt. Could you say
 22 what the colors are?
 23 MR. RAICHE: So the colors are
 24 essentially the bacteria counts. So the maroon,
 25 I guess, would be the worst, the purple is pretty

1 C E R T I F I C A T E
 2
 3
 4 I, Denise A. Webb, Notary Public, do
 5 reby certify that the foregoing is a true,
 6 curate, and complete transcription of my
 7 enographic notes taken at the time of the
 8 orementioned hearing.
 9
 10 IN WITNESS WHEREOF, I have hereunto set my
 11 nd and seal this 13th day of November, 2014.
 12
 13
 14
 15
 16
 17
 18 *Denise A. Webb, RPR*
 19 *Notary Public*
 20 
 21 DENISE A. WEBB, CSR/RPR/NOTARY PUBLIC
 22 MY COMMISSION EXPIRES APRIL 7, 2018
 23
 24 E: October 23, 2014
 25 E: NBC: STAKEHOLDERS' MEETING

	abstract (1) 71:6	added (3) 7:24;45:1;112:16	afield (1) 73:7	22;28;5;29;12;30;9; 31:2,20;37:2;39:23; 40:6;42:10,17;64:21; 65:1
\$	accept (1) 87:24	adding (1) 102:13	Again (46) 3:2;14:25;19:23; 23:13;24:20;27:7;32:6; 36:10;37:7;40:3;44:6; 54:11;58:17,20;59:23; 72:22;73:12;74:7,16; 83:22;89:17;91:6; 92:19;96:21;98:2,25; 99:5,14,17;100:19; 104:1,25;115:11,13; 116:5,17;119:10,19; 122:2,16;123:17; 124:19;125:7,21,25; 128:20	algorithm (2) 29:1;31:6
\$1.17 (1) 89:12	accepted (1) 113:23	addition (3) 106:10;119:7;135:10	against (7) 12:25;96:22;110:1,6; 111:7,15;122:7	allocation (1) 64:19
\$10 (1) 102:19	access (2) 112:1,2	additional (20) 10:14;13:7;14:12; 21:9;22:17;23:1;34:5; 51:7;59:6;65:7;68:3; 97:9;105:21,24;118:4; 8;122:25;123:1,18; 124:17	age (2) 53:8;58:15	allow (2) 49:2;77:24
\$100,000 (1) 56:13	accommodate (4) 74:19;75:22;105:16; 122:21	address (6) 4:17;16:19;31:16,17; 33:11,12	aged (1) 53:12	allowed (1) 34:4
\$14 (1) 102:21	accomplish (1) 109:7	addressed (1) 59:9	agency (4) 43:10;83:1;109:7; 129:13	allows (2) 115:18;118:4
\$17 (1) 104:13	accomplished (1) 71:22	addresses (1) 131:7	agenda (3) 2:24,24;3:2	almost (14) 9:14;12:21;14:13; 27:6;30:19;76:1;84:7; 85:21;90:23;104:13; 113:25;118:19;122:10; 128:13
\$175 (1) 10:23	account (7) 17:4;29:18;41:8; 43:19;52:23;77:8; 99:12	addressing (1) 63:7	aggregate (1) 89:6	alone (1) 67:15
\$2,000 (1) 27:6	accounts (2) 12:21;16:25	ADJOURNED (1) 135:19	aggregated (1) 87:22	along (11) 10:19;20:17;26:19; 44:22;96:6;97:20; 101:3;102:17;108:4; 109:18;118:14
\$25,000 (1) 35:10	accurate (2) 112:16;133:20	adjust (1) 30:3	aggressive (7) 12:10,16;70:17; 75:11;82:22;86:18; 89:16	alongside (1) 18:18
\$32.02 (1) 88:16	accurately (1) 24:18	adjusted (3) 24:13;45:7;51:15	aging (1) 133:2	alterative (1) 110:15
\$4 (1) 59:8	achieve (4) 76:16;77:11;79:1,24	adjusting (1) 17:18	ago (3) 6:7;25:8;110:23	alternates (1) 115:16
\$48.01 (1) 88:16	achieved (1) 81:5	administrations (2) 118:23;130:1	agree (4) 29:12;117:3;131:14, 23	alternative (19) 3:18;4:13;5:17,24; 66:10;72:13,15;75:21; 76:4;91:4;105:8;106:3; 107:7;117:11;118:15, 17;122:17;124:6,19
\$49,000 (1) 34:14	achieve (1) 81:5	administrations (1) 129:17	agreements (1) 110:4	Alternatively (1) 124:25
\$560 (1) 71:24	across (12) 33:3;34:14;47:22; 52:16;73:18;82:12,14; 86:21;104:19;106:11, 16;112:23	adopted (1) 31:9	agrees (2) 80:21;83:8	alternates (1) 115:16
\$570 (1) 71:24	Act (7) 4:8,14;76:15;77:14; 78:21;111:7;120:1	advance (1) 127:2	ahead (2) 19:13;111:16	alternative (19) 3:18;4:13;5:17,24; 66:10;72:13,15;75:21; 76:4;91:4;105:8;106:3; 107:7;117:11;118:15, 17;122:17;124:6,19
\$6 (1) 14:2	active (1) 108:2	advocating (1) 133:15	aim (1) 21:13	Alternatives (23) 5:14,25;6:8;66:12; 72:16,18,21;73:12; 74:4;81:9;88:13;92:10; 96:9,19,20,22;97:15; 104:5,9;113:6;114:3,3; 116:22
\$602 (1) 13:3	actual (11) 17:1,11,12,13;21:18; 23:13;26:23;27:5;29:3; 33:16;35:16	affected (1) 126:6	akin (1) 71:17	Although (2) 83:25;110:1
\$740,730,396 (1) 8:21	actually (46) 8:19;9:9;11:25;12:7; 13:18;17:16,21;19:4; 21:12;23:12;26:13,14; 27:23;28:12;31:4;34:4, 9,18;35:23;38:13; 44:24;45:6;53:17;55:8; 61:23;65:18,20;71:17; 78:13;85:11;92:25; 93:2;94:13;95:8;97:19; 100:8;107:23;108:12, 15;110:12;117:5; 118:2;121:19;122:17, 22;135:6	afford (2) 51:25;79:17	Albertsen (6) 6:16;15:24;18:4,5; 19:23;37:3	always (5) 15:22;17:5;61:19; 126:13,14
\$75 (1) 44:16	ADA (1) 97:8	affordability (37) 5:11;6:10,13,21,23; 7:8;9:4;16:20,22;25:7; 27:14;29:15;31:7; 32:21;33:7;35:15,23; 38:21;39:5;41:5;47:14; 48:4;49:2;50:19;55:3; 62:8;66:16;70:7;79:17; 95:9;111:10;117:2; 120:2;128:16,19; 132:5,8	ALBERTSON (23) 22:10,19;23:11;25:6, 20,25;26:11,24;27:3,7,	ambiguously (1) 30:17
\$789 (2) 25:17;27:1	add (7) 10:22;15:6;32:25; 44:9;57:20;59:25; 92:19	affordable (11) 4:11,17;25:10;31:11, 16;32:14;43:2;49:20; 50:1,1;132:11		Ames (1) 64:9
\$789.95 (1) 24:8				amongst (1) 83:13
\$915.8 (2) 8:23;11:7				amount (7) 8:20;12:12,13;24:4; 56:1;64:12;72:3
A				amounts (1)
abandoned (3) 106:9;107:4;108:1				
ability (1) 34:1				
able (20) 7:7;13:16;14:12,18, 24;16:15;17:10;26:3; 34:22;37:24;48:9,15; 49:5;51:8,11,21;53:16; 54:14;56:19;67:4				
above (3) 101:5,9,11				
absolutely (5) 43:24;70:9;75:17; 100:6;107:25				

6:20 analyses (3) 43:8;48:3;65:7 analysis (35) 5:11,14,18;6:8;7:9; 9:4;16:20;17:10;22:20; 27:10;32:21;46:6,10; 47:14;64:11;65:5,23; 68:21;72:13,15;75:2; 79:11,19;80:17;82:6; 90:7;96:20;103:18; 111:14;116:23;117:11; 125:6,18;128:9;132:4 analyzed (1) 16:2 analyzing (1) 67:9 ancillary (2) 97:3;117:25 ANDERSON (19) 26:5;28:2;75:16; 81:23,24;85:22,24; 87:13;89:21;90:5; 91:11,13;92:9;93:4; 94:11,18;95:2,15; 135:3 Angelo (2) 80:6;133:25 angle (1) 31:5 annual (14) 14:22;15:25;20:16; 21:6;24:1;50:11;53:9; 17,18,18;54:12;89:4; 104:5;126:12 annualized (1) 103:25 anticipate (3) 5:19;55:17;66:25 anticipated (1) 127:14 anticipation (1) 121:15 anymore (1) 87:9 apartments (1) 29:21 apparently (2) 106:3;124:12 applaud (1) 132:22 apples (4) 49:22,22;90:7,7 apples-to-apples (1) 111:5 applicable (3) 64:7;82:11;89:13 application (1) 81:7 applications (2) 75:11;113:16 applying (1) 17:13	appraise (1) 82:4 appreciate (3) 46:5;71:1,2 approach (9) 33:22;34:19;44:1,8; 47:2;52:5;65:7;98:18; 114:5 appropriate (1) 81:3 approve (1) 133:11 April (2) 5:23;103:15 area (39) 16:12;17:2;22:18,21, 23,25;23:2,4,10;28:11, 23;34:17;36:23,25; 39:15;40:9,12,14,19; 42:20,25;59:23;61:13; 74:2;77:9;82:13,15; 86:21;98:9,10,12,15; 106:17;108:9,14; 109:17;118:6,13; 126:19 area-by-area (1) 98:7 areas (19) 36:24;73:16,20,25; 76:25;78:15;92:23; 97:13;98:4,4,6;99:14; 101:8;102:5;104:11; 116:14;126:7;127:1; 128:4 argue (1) 45:19 arguing (1) 71:23 argument (1) 46:18 arise (1) 71:5 around (14) 44:10,20;67:19; 68:18;69:24;80:14; 88:1;89:9;107:7;108:4, 9,16;125:3;129:19 art (1) 106:23 aside (1) 63:18 aspect (2) 86:4;87:3 aspects (1) 82:20 assessment (2) 10:12;16:16 asset (8) 56:6;67:6;68:1,2; 69:14,15,16;89:2 assets (4) 8:1;46:22;63:22; 67:10	assist (1) 129:13 associated (17) 8:1;21:5;53:25;56:8; 57:3;90:8,16;97:21; 101:19;105:10;110:5; 111:3;113:11;114:9; 116:2;123:18;124:18 Association (2) 29:17;130:13 assume (10) 42:3,14;43:18;47:17; 51:2;89:20,25;103:8; 121:21;134:2 assumed (1) 9:1 assumes (2) 40:25;57:13 assuming (10) 7:15,21;13:10;21:19; 22:15;44:18;56:15; 59:7;129:11,12 assumption (8) 14:9;41:22;44:12; 51:13;56:17;58:16; 60:23;64:11 assumptions (11) 7:11;19:12;20:2; 23:20;36:8;42:7;44:13, 14;55:25;56:22;67:18 attainability (4) 80:16;81:4,8,15 attempting (1) 26:6 attended (1) 133:21 attending (1) 63:6 attractive (1) 106:3 atypical (1) 83:11 authorities (1) 4:3 Authority (2) 7:16;21:16 automatically (1) 45:4 available (5) 31:6;64:12;80:25; 100:24;102:10 Ave (1) 104:23 Avenue (7) 97:18;104:15;105:2, 18,19,23;124:16 average (17) 14:1;15:25;17:21; 34:18;40:20;53:7,11; 54:11;56:12;57:2,25; 58:15;61:11;102:18, 20;104:13,25 averages (3)	13:6;61:22,24 avoid (1) 101:9 away (8) 4:22;13:23;45:2; 46:13,23;84:13;86:5; 119:3 awful (2) 89:13;93:9 AWWA/WEF (1) 33:25	B	14:7;57:9;58:18; 112:4,10 bare (1) 44:17 barely (1) 85:8 bars (1) 111:23 base (5) 26:15;42:22;44:14; 63:24;70:17 based (14) 13:5;16:1;34:15; 43:12;66:12;75:8;86:7; 87:21;92:13;103:19; 117:2,17;123:20; 125:18 baseline (16) 9:4,12;12:8;19:24; 24:10;48:8,17;51:5,9, 22;55:23;65:4;72:23; 104:4,9;117:5 bases (1) 95:12 basically (10) 12:21;45:2;51:22; 53:4;64:1;67:3,7;77:5, 18;106:15 basing (1) 29:19 bad (3) 30:24;69:18;135:1 BAIRD (51) 6:14,14;9:25;10:4,7, 16;11:6,17,21;13:13; 15:7,10,12,19;32:1,17; 37:20,24;38:15;40:7; 41:6,25;42:24;43:13; 44:24;45:24;46:2;48:6; 49:1,8,15;50:8;52:11; 54:20;55:2;56:5;57:2, 10;58:24;59:18;60:14; 62:17;63:2;64:14,17, 24;65:11;66:1;67:1; 68:19;69:5 balance (6) 7:3;115:18,23; 116:10;121:6,22 balanced (2) 43:25;52:5 ball (8) 100:16;101:23,23; 102:2,7;109:15; 110:10;125:2 ballpark (1) 74:21 bang (1) 126:9 bank (1) 51:10 banks (1) 47:25 bar (5)	14:7;57:9;58:18; 112:4,10 bare (1) 44:17 barely (1) 85:8 bars (1) 111:23 base (5) 26:15;42:22;44:14; 63:24;70:17 based (14) 13:5;16:1;34:15; 43:12;66:12;75:8;86:7; 87:21;92:13;103:19; 117:2,17;123:20; 125:18 baseline (16) 9:4,12;12:8;19:24; 24:10;48:8,17;51:5,9, 22;55:23;65:4;72:23; 104:4,9;117:5 bases (1) 95:12 basically (10) 12:21;45:2;51:22; 53:4;64:1;67:3,7;77:5, 18;106:15 basing (1) 29:19 bad (3) 30:24;69:18;135:1 BAIRD (51) 6:14,14;9:25;10:4,7, 16;11:6,17,21;13:13; 15:7,10,12,19;32:1,17; 37:20,24;38:15;40:7; 41:6,25;42:24;43:13; 44:24;45:24;46:2;48:6; 49:1,8,15;50:8;52:11; 54:20;55:2;56:5;57:2, 10;58:24;59:18;60:14; 62:17;63:2;64:14,17, 24;65:11;66:1;67:1; 68:19;69:5 balance (6) 7:3;115:18,23; 116:10;121:6,22 balanced (2) 43:25;52:5 ball (8) 100:16;101:23,23; 102:2,7;109:15; 110:10;125:2 ballpark (1) 74:21 bang (1) 126:9 bank (1) 51:10 banks (1) 47:25 bar (5)
--	---	---	--	----------	--	--

<p>80:7;87:5 below (5) 35:1;78:4;101:8,16,21 benchmarking (1) 17:24 beneath (1) 100:15 benefit (10) 38:15;46:10;71:11; 74:9;95:7;119:23; 125:14;128:10;131:17,20 benefits (14) 48:16;51:2;117:3; 118:1,8;119:24;123:1, 14;124:1;127:5,14; 128:5,16;131:16 besides (1) 53:1 best (11) 6:4;31:5;41:16;44:2, 15;75:15;83:12;95:11; 115:14;124:24;125:16 better (7) 51:11,15;92:17; 108:10;111:19;115:15; 120:1 beyond (4) 6:3;11:22;85:3; 132:6 bicycle (1) 15:20 bifurcated (3) 114:4,5,8 big (6) 45:1;88:22;89:19; 99:9;120:12;122:8 Bigger (5) 62:10,10;89:14,14, 15 biggest (1) 116:18 bill (4) 27:9,20;29:22;57:3 billed (1) 26:14 billing (2) 21:25;27:23 billion (1) 88:6 bills (10) 17:1,11,12;19:18; 27:11;29:24,25;33:16; 35:17;42:8 Bill's (2) 76:19;77:2 Bishop (65) 8:24,24;9:12,19; 11:3;15:4,4,8,11,17; 19:14,14;23:9;25:14, 15,21;26:3,8;27:16,16, 25;28:24;30:15,15;</p>	<p>37:11,22;38:10;41:23, 24;42:1,11;44:6;45:8; 46:1;49:10;54:22,22; 55:4,6,22;70:20,21; 85:16,23;87:11;89:17, 22;91:6,6,12;95:18; 103:6;109:3;110:8; 112:21,21;113:4,19; 114:11,15,22;120:12, 13;121:12;135:18 bit (23) 6:18;8:15;13:6; 14:11,13;15:21;18:2; 27:10;30:17;33:1;44:9; 49:21;75:1;87:6;89:5; 90:24;91:20;96:24; 98:6,8,15;118:10; 130:21 bites (1) 68:11 black (1) 120:13 Blackstone (3) 75:25;118:14;127:16 blanket (1) 33:14 block (1) 38:3 blockbuster (1) 96:7 blocks (4) 37:1;38:2,6,11 blue (7) 56:24,24;112:10,12, 22;113:23;114:12 boat (1) 48:22 body (1) 128:7 bolts (1) 18:6 bond (3) 7:18;19:5;28:7 bonds (2) 21:15;51:18 borrow (1) 44:16 both (8) 16:2;18:24;66:19; 73:4;85:4;102:6,8; 121:21 bottom (3) 37:9;87:17;88:15 box (1) 110:9 boxes (1) 86:20 bracket (1) 44:19 brackets (1) 35:17 Branch (4) 97:18;105:18,19,23</p>	<p>break (12) 5:8,8,13;32:5,10; 59:22;67:12;70:11; 72:9;83:4;88:8;129:2 Brian (16) 8:24;9:16;15:4; 19:14;25:15;27:16; 30:15;41:24;54:22; 70:21;91:6;95:17; 112:21;120:13;123:5; 135:17 Brian's (1) 11:1 bridge (1) 110:10 BRIEF (2) 33:20;72:11 briefly (3) 54:23;83:10,15 bring (12) 20:5,22;23:6;24:19, 21;33:15;34:1;51:1; 73:6;100:3;129:23; 131:15 bringing (4) 16:23;22:11;39:25; 99:16 brings (3) 24:23;77:25;111:13 brought (2) 70:12;129:17 BRUECKNER (19) 3:4,8,9;9:16,16; 59:11,12,12;66:7,10; 77:13,20;78:12;79:10; 80:1;107:14;108:12; 133:17;135:14 B-R-U-E-C-K-N-E-R (1) 3:9 buck (1) 126:9 bucket (1) 41:19 buckets (6) 17:15;35:3;50:15,16; 59:5;61:7 Buckland (5) 101:10;121:4; 122:14,20;123:13 bucks (3) 89:10;90:19;104:7 build (13) 38:2;41:9;63:20,23; 66:15;85:13;87:2;97:3; 110:10;120:23;121:25; 122:5,19 building (10) 2:10;12:18;31:13; 65:16;92:22;101:1,17, 18;105:15;125:4 buildings (1) 106:9 buildup (1)</p>	<p>8:3 built (6) 22:15;23:9;55:19; 67:18;103:4;105:22 bunch (3) 99:23;106:8;112:8 burden (9) 18:15,17,24,24,25; 19:20;24:24;25:11,13 business (4) 67:15;107:19,21; 132:17 businesses (6) 42:25;43:3;108:3,3, 15;132:18</p>	<p>capacity (4) 14:15;71:13;97:20; 121:20 capital (30) 7:4;8:6,22;10:4,5,15; 11:11;13:14;14:2,5,16; 20:16,18,19;41:11; 43:14;45:1;51:7,12,14; 54:10;58:3;66:19; 96:23;115:17;116:5; 118:20;122:7,11; 123:22 capture (5) 13:16;43:6;64:3; 104:12;108:7 captured (2) 68:2;97:25 capturing (2) 43:21;73:4 care (9) 16:20;53:5;56:19,21; 59:18;60:18;63:21,24; 87:6 Carolina (1) 29:6 Caroline (7) 12:19;22:6;31:3; 42:13;78:23;109:11; 114:23 Caroline's (1) 128:2 carry (2) 119:21;125:5 case (21) 10:8;30:23;38:17,24; 40:24;41:4;43:11,12, 18,24;44:2,2;54:15; 56:2,10;60:7;61:2; 64:3;90:23;100:4; 117:6 cases (4) 14:21,23;91:2,5 cash (5) 14:25;20:19;21:17; 23:24,25 cast (2) 50:18;103:10 catch (2) 11:23;79:6 catchments (1) 72:25 categories (3) 8:8;102:15;126:25 category (5) 8:11,13;10:1;98:3; 102:15 causing (1) 131:5 cautious (1) 71:16 caveats (1) 110:24 CDRA (2)</p>
		C		
			<p>cabin (1) 109:14 calculate (2) 16:15;53:16 calculated (2) 53:9;112:25 calculation (2) 18:7;64:16 calculations (1) 42:14 calibrated (2) 36:3;134:10 calibrating (2) 12:24;17:24 called (2) 5:10;132:13 calling (2) 36:7;130:7 came (2) 27:18;72:14 can (89) 6:3;8:18;13:18;14:6, 8,15;15:6;16:2;21:14; 23:14;24:18;25:15; 30:9;34:15;35:6;36:13; 37:13;39:23;41:16,23; 45:2;46:12;47:10,14, 20;48:4;50:19;51:6,15; 52:7,8;53:8;54:18; 56:17;57:15,20;58:1,5, 17;60:3,5,15,20;61:2, 24;62:1,4,4;63:10; 65:6,8;66:24;74:9,14, 18;75:1;78:22;79:17; 81:6;83:11;85:7,8; 86:3,24,24,25;87:5; 92:2,16;94:10;95:8,12; 97:13;98:18;100:8; 103:6;105:16;112:14, 21,22;113:21;114:18; 118:7;120:15,22; 121:17;126:15;130:9; 133:10 capability (2) 16:16;18:19</p>	

<p>9:17;72:24 ceiling (1) 63:14 ceilings (1) 63:15 census (24) 17:13;27:19,21; 34:16,23;35:4,5,7,18; 37:4,5,6,10,16;38:2,4; 52:14;57:3,23;58:1,9; 60:3,25;61:25 Central (19) 26:21;27:18;36:17; 38:25;40:15,17,19; 60:8,17;61:3,9;73:7; 100:16;102:5;104:19; 112:14;113:16;130:16; 131:6 centralized (4) 99:16;103:15;119:2; 124:17 cents (2) 88:25;89:9 century (2) 51:18;94:4 certain (13) 12:12,13;19:21; 46:18;52:20;77:24; 79:5;80:24;92:15; 109:6;120:23;129:13; 135:5 certainly (1) 55:9 cesspools (1) 131:4 cetera (1) 10:14 challenges (1) 84:18 championing (1) 110:20 chance (1) 92:7 change (12) 10:18;34:6;35:23; 42:19;46:1,2;51:9,12, 21;57:14;65:2;94:12 changed (1) 26:9 changes (3) 60:4,5;69:7 changing (2) 58:4;59:4 charge (1) 16:1 charges (1) 7:14 charging (1) 62:13 chart (1) 133:9 chasing (1) 30:7</p>	<p>cheaper (1) 106:4 chemical (1) 115:9 chlorine (3) 4:4;120:12;125:4 chunk (1) 84:12 CIP (9) 20:20;23:22;56:15; 57:12,13;59:8;60:12, 15;65:19 CIPs (1) 58:16 cities (8) 38:7;55:13;67:8,21; 75:13;86:17;89:15; 129:21 City (24) 26:20;36:16,17; 38:24;43:10;49:17,19, 24;56:11,23;57:4,20, 23;58:21;59:22;60:17; 63:19;100:11,21,24,25; 103:21;122:1,4 civil (1) 87:6 clarification (4) 3:16;12:2;103:22; 116:21 clarify (2) 4:24;22:14 Clean (12) 4:8,13;7:16;21:16; 71:5,6;76:15;77:14; 78:20;111:7;119:25; 129:12 cleanability (3) 79:11,19,22 cleanup (1) 130:4 clear (5) 23:18;31:11;58:21; 76:14;78:17 climate (2) 10:18;94:12 climatologist (1) 95:1 clipping (1) 85:19 close (1) 123:12 coast (1) 24:9 co-benefits (8) 96:14;105:12; 115:22;116:9;117:13, 15,22;118:4 coding (2) 17:25;36:1 coliform (1) 76:23 collapse (1)</p>	<p>67:13 collapsed (1) 54:3 colleague (2) 6:15;15:24 collected (2) 121:13;134:9 collection (12) 19:11;20:14;28:18; 39:3;53:4,6,25;55:7; 56:22;59:20;60:18; 63:21 color (2) 17:25;35:25 colored (2) 36:25;111:23 colors (5) 46:1,2;134:19,22,23 Colt (9) 64:9,9,15,23;65:3, 22;66:4,6,17 column (1) 11:4 columns (1) 90:12 combination (3) 47:3;89:20;114:1 combines (1) 55:10 Combining (1) 98:20 coming (5) 16:8;33:4;55:17; 65:5;130:18 COMMENCED (1) 2:1 comment (5) 2:19;69:10;132:2; 133:18;135:15 comments (1) 3:3 Commerce (1) 132:3 commercial (2) 42:20;44:15 Commission (4) 59:10;76:8;130:20; 131:10 common (1) 33:14 communities (14) 20:15;24:15,18; 38:23;52:18,19;53:3; 55:10;64:8;70:19; 75:12;102:8,12;132:25 community (8) 18:11;26:16;27:12; 51:6;52:23;61:19; 109:16;117:16 comparative (1) 89:3 comparatively (1) 104:23</p>	<p>compare (5) 20:10;92:2;102:21; 104:9,22 compared (7) 19:7,9;28:11;112:10; 113:9;115:20;121:19 compares (1) 115:15 comparing (6) 20:6;22:12;104:5; 113:6;120:18;128:7 comparison (8) 49:23;90:3;91:4,8; 98:20;111:5,6;117:4 competition (1) 75:10 competitive (5) 74:11;105:1,6;118:3; 122:5 complete (1) 32:24 completed (2) 13:22;127:8 completely (3) 29:12;34:20;117:3 complex (1) 115:8 complexity (1) 33:1 compliance (1) 128:18 compliant (1) 119:25 component (16) 7:24;8:17;16:6; 32:15;35:11;38:21; 42:16,20;52:2,15; 55:18;57:19;68:24; 73:21;114:25;126:23 components (12) 32:4,9,25;40:15; 54:13;57:20;60:23; 73:3;96:11;114:7; 116:23;126:18 compounded (1) 15:5 comprehensively (1) 133:13 comprise (1) 32:10 computers (1) 45:13 conceivably (4) 101:9;105:19;123:8; 124:20 conceive (1) 12:18 concept (4) 17:7;75:6;80:5;88:9 concepts (1) 74:5 conceptual (6) 82:3,12,16,19;87:18,</p>	<p>20 concern (1) 69:19 concerns (2) 85:18;108:16 conclude (2) 5:14;6:9 concluding (1) 5:17 conclusion (4) 73:21;118:2,15,19 conclusions (8) 96:20;125:8;126:4, 17,17,21,22;128:12 concrete (3) 87:8,9,12 condition (5) 67:11,21;88:19; 123:10;134:3 condition-based (1) 56:7 conditions (5) 80:24;84:7;86:2; 89:11;127:13 conduit (2) 103:1;121:3 conduits (1) 100:3 Conference (3) 33:9,24;63:3 configuration (1) 124:5 confused (1) 103:7 Congress (1) 62:11 conjunction (1) 81:20 connect (1) 105:23 connotation (1) 93:22 consensus (3) 32:18,21;80:22 consent (1) 12:3 conservation (1) 30:8 conservative (7) 7:11;8:2;43:23; 44:11;53:18;55:25; 67:20 conserve (1) 30:24 consider (11) 29:8;33:6;62:12; 83:24;89:1;90:9;93:18, 19;114:17;119:21; 120:5 consideration (7) 9:14;17:3,15;26:13; 49:3;62:16;127:5 considerations (3)</p>
--	--	--	---	--

<p>118:24;123:20; 135:11 considered (8) 3:18;30:12,14;36:19; 62:11,24;66:14;80:12 consistent (1) 18:1 consolidation (2) 100:3;103:1 constant (5) 40:5;41:1,2,3;110:14 constrained (2) 72:19;112:6 constraint (1) 63:13 constraints (7) 74:12,16;120:16,20; 121:1,24;125:13 constructibility (1) 119:10 construction (28) 12:6,7,10,16,16; 13:20;21:10;23:22; 42:4;70:15;87:21; 96:14;97:4;101:22; 102:1;104:22;105:13; 107:21;116:1,8; 119:11,16,16,19;120:4; 124:14;125:22;126:9 consultants (1) 5:6 consumer (1) 132:16 consumption (3) 16:7;30:20;33:17 contain (1) 3:24 contained (1) 34:16 contaminated (6) 101:6,7,10;103:3; 119:12,12 context (1) 93:18 continue (5) 33:10;37:20;54:5; 67:4;121:12 continuing (1) 62:14 contractors (1) 76:8 contributing (1) 73:2 control (8) 73:9;74:15;85:4,6; 100:1;115:4;119:2,4 controls (1) 31:18 cool (1) 101:1 corner (2) 37:10;88:15 Corps (1)</p>	<p>67:2 correctly (1) 25:23 corresponding (1) 73:23 cost (98) 6:3;7:4,21;9:1; 13:11;16:6;18:12;20:9; 16:21;22:22,3,13;24:8; 11;25:18;26:22,23; 29:4,6,18;30:18,25; 42:2,7,15;46:14,25; 47:8,18;48:15;50:4; 51:12,14;52:3;56:25; 58:13;67:14;68:15,22; 70:18;71:4;74:9,10; 82:10;85:21;87:17; 88:24;89:7;90:3,8,13, 24,25;91:3;92:3,5,7,14; 93:1;96:18,18;97:1,21; 98:10,15,18;99:3; 102:22,23;103:9,17,19; 105:5,10;106:2; 107:10,12;110:2,5,12, 21;112:5,9;113:11,12; 118:3;119:15;120:5; 122:5,8;123:20,22; 124:17;125:20;129:8; 132:23,24;133:8 costly (3) 112:19;115:2;124:13 costs (86) 5:16;6:10;7:23;9:4, 23;10:20;11:8;12:24, 25;13:2;20:13,15,24; 21:1,3,7,24;23:17,18; 24:3,6,24;26:2,9,15; 30:22;34:8;38:20;39:2, 4;41:11;42:4,22;43:14; 44:25;45:1;52:16;53:2, 17;54:12,24;55:1; 56:14,18;57:18;58:18; 60:21;66:10,24;69:1; 71:10;87:19,21,25; 89:18;90:3;95:9;96:16, 23;97:3,9,12,25;98:5, 22;99:11;103:4; 104:12;107:13,20; 111:3,14;113:8;115:1, 6,10,10,16,17;116:5; 118:20;122:11,11; 123:18;124:8;135:10 Council (1) 63:4 count (1) 114:23 counting (3) 7:13;37:19;112:24 country (6) 47:23;69:25;73:20; 80:15;88:1;129:20 counts (1) 134:24</p>	<p>County (2) 34:13;63:15 couple (18) 15:23;31:14;48:7; 49:7;57:22;73:3; 111:15,21;114:2; 125:15;127:1,6,23; 128:1,22;129:14; 134:16,17 course (2) 63:9;93:5 COURT (3) 3:7;133:24;134:20 cover (2) 7:17;95:12 covered (1) 71:4 Cranston (1) 131:1 created (2) 51:23;112:23 creating (1) 51:5 credit (2) 71:15,15 criteria (15) 6:2;80:4;92:12,14; 96:12,13,21;106:1; 110:1,7;111:15; 115:14;123:23;124:4,6 critical (3) 6:24;35:11;70:5 criticism (1) 28:25 Cross (1) 104:17 cross-connect (1) 105:25 cross-town (2) 76:6;124:18 CSO (25) 4:17;5:25;8:17;21:6; 30:22;58:21;59:2; 73:22;74:5;81:10; 83:17;86:6,11;88:5,24; 89:4;90:14;99:6,15; 108:8;121:9,14; 125:25;130:17;132:24 CSOs (14) 30:19;73:1,4,6,9,17; 75:22,24;76:12;85:7; 87:15;90:2;125:11; 129:21 CSR (1) 116:14 curious (2) 69:22;107:6 current (11) 11:24;17:19;20:12; 23:17;55:23;57:13; 76:9;86:11;87:21; 124:5;127:12 currently (12)</p>	<p>9:5;22:8,10;24:10; 55:13;58:11;83:18; 86:1;87:15;94:14; 100:21;106:19 customer (2) 37:6,8 customers (2) 37:3,4 cut (2) 15:17,18 cycle (1) 12:17</p>	<p>35:7 delivered (1) 93:7 DEM (2) 4:5;80:6 demand (1) 30:13 demanding (1) 44:21 demobilization (1) 69:1 demographic (1) 61:24 demographics (2) 41:20;61:19 demonstrate (2) 45:5;135:9 Denise (1) 2:12 Denise's (1) 2:17 densely (2) 100:11;102:8 denser (1) 102:5 dependent (1) 121:9 depending (2) 67:20;78:16 depends (1) 53:22 derive (1) 119:24 derived (1) 54:19 design (11) 4:15,18;12:5,5;79:6; 82:16,19;86:1;87:18; 88:18;134:12 designed (2) 79:8;128:23 designs (4) 82:4,12,14;87:20 desirable (1) 31:13 desire (1) 71:6 desperate (1) 82:7 despite (1) 19:20 detail (3) 5:16;37:25;39:1 details (1) 80:8 determination (1) 47:6 determine (7) 5:25;6:3;12:4;46:20; 116:23;121:15;128:9 determined (2) 12:10;73:16 determining (2)</p>
D				
			<p>dangerous (1) 130:23 dark (3) 112:22;113:23; 114:12 data (12) 21:25;24:20;27:12, 23;31:10,15;35:19; 61:1;76:12,13;134:6,8 date (3) 4:3;12:6;131:25 day (3) 16:1,5;68:16 days (5) 8:4;45:8;69:24; 127:23;134:17 deadline (1) 128:18 deal (3) 94:10;95:8;103:3 dealing (3) 52:14;75:25;101:6 debate (2) 70:24;124:1 debt (22) 7:3,5,14,22;11:12; 13:11,16;14:7,10,11, 13,14;15:2;19:6;20:17; 28:8;51:17;56:15,16; 58:16;62:13;63:14 decide (3) 31:6;47:11;71:25 deep (6) 74:6;98:25;99:3; 112:7,10;119:13 defer (1) 125:22 defined (1) 9:6 defining (2) 5:24;72:16 definitely (2) 30:13;93:12 degree (3) 53:22;65:6,8 delayed (1) 120:2 delineated (1)</p>	

<p>128:17;132:10 develop (2) 78:25;110:21 developed (3) 4:2;100:11;102:8 development (1) 100:22 dictate (1) 48:20 difference (5) 9:10;13:1;65:10; 105:4;122:8 differences (1) 86:4 different (49) 8:1,7,13;14:19; 17:15,22;18:20;20:25; 28:21;31:4;35:3,20; 36:4;43:4,22;44:4; 49:25;50:14,20,22; 52:14;54:9;60:3;61:17, 25;62:17;63:5,10,12, 25;64:3,5;65:17;82:5; 86:24;90:22;98:3,17, 20;102:15;104:8; 111:23;125:2,15; 126:25;128:1;129:22; 134:12,15 difficult (12) 44:20;75:21;76:2; 82:8;98:13;100:11; 102:4;104:21,24; 107:23;119:4;126:10 difficulty (2) 30:17;124:10 dig (3) 12:13;87:7,8 digging (1) 119:13 dimensionality (1) 44:9 diminishing (1) 93:16 directed (2) 79:1;80:4 directly (2) 73:5;102:16 disappear (1) 58:23 disappointed (1) 132:7 discharge (3) 3:23;4:9;100:2 discharges (1) 125:25 discharging (1) 4:17 discipline (1) 5:5 discounting (1) 40:1 discuss (1) 6:12</p>	<p>discussed (7) 3:21;4:21;6:2;52:6; 72:14;96:12;110:24 discussion (13) 3:11,14;5:18;35:15; 50:9;63:16,18;66:13; 70:23;79:16;81:17; 132:7;133:10 discussions (6) 50:21;63:2,5,25; 78:18;133:4 disguise (1) 70:25 disinfection (11) 3:17,22;4:6;110:21; 111:3;119:22;120:8; 122:18;124:21,24; 125:1 disparate (8) 93:14;99:15;104:11; 115:3;120:17;121:4,8; 124:11 disputing (1) 95:2 disrupted (1) 119:18 disruption (1) 67:16 disruptions (5) 116:1,8;119:17; 122:13;124:14 distinction (1) 75:18 distinguishing (1) 123:7 distribution (5) 17:4,16;33:11;34:20, 25 district (5) 23:4,6;33:14;73:18; 133:7 districts (1) 106:23 diverse (1) 82:7 diverting (1) 106:15 divide (3) 18:13;24:7,22 dividing (1) 26:16 doable (1) 77:23 document (1) 16:14 documentation (1) 18:8 documents (1) 63:8 dog (1) 30:7 dollar (3) 6:19;44:1;68:21</p>	<p>dollars (13) 8:21;9:10;13:2,3; 20:6,7;21:2;22:11; 24:20,21;40:1;88:6; 112:3 domain (1) 109:4 DOMENICA (23) 2:2,15;4:25;32:11; 42:12,18;43:9;49:6,17; 52:7;68:5;69:8;70:9; 72:7;81:16;95:13,17; 111:25;123:5;128:25; 131:21;132:1;135:13 DOMINICA (3) 11:15,15,18 done (18) 26:6;44:9;56:2,9; 59:3;67:16,22;79:12; 80:13,16;81:4;83:8; 90:6;93:21;95:5;97:8; 107:15;118:6 door (3) 2:4,8;48:9 double (1) 14:14 down (27) 13:21;15:18;29:25, 25;35:1;38:22;39:1,8; 44:5;59:23;61:8;64:2; 65:23;68:9,10;70:3; 74:14;82:8,18;88:9; 99:6;100:7;114:24; 117:1;121:4;122:20; 130:21 downgrade (1) 81:7 downside (1) 43:5 downstream (1) 125:13 downtime (2) 95:19,20 drag (1) 69:17 drain (4) 34:8;39:3;54:10; 57:12 drains (2) 59:13;108:8 dramatically (1) 132:14 draw (2) 56:11;125:8 drawing (4) 14:19;17:11,12;67:5 drill (2) 38:22;68:16 drilling (2) 39:8;68:17 drive (1) 73:11 dollar (3) 6:19;44:1;68:21</p>	<p>125:12 driving (1) 11:12 drop (9) 12:8;73:5;99:4,10; 102:17;103:10;114:10; 122:6;123:11 drops (2) 13:21;132:13 drove (1) 64:2 dual (3) 98:9;116:4,6 due (2) 104:18;120:2 during (9) 8:19;80:23;101:25; 102:2,4;104:3;107:21; 119:18;127:11 duty (1) 10:18 DVDC (1) 77:1 dwelling (3) 22:4;27:1,2</p>	<p>eight (1) 82:13 either (6) 10:3;63:14;70:2; 74:9;98:22,25 Elaine (1) 26:20 element (2) 34:22;54:8 eliminate (3) 4:9;73:14;124:15 eliminations (1) 124:19 else (8) 11:9;30:5,6;34:8; 75:14;92:17;96:1; 130:7 else's (1) 30:1 elsewhere (1) 123:4 embarked (1) 116:21 embarking (1) 125:23 embedded (1) 7:23 emergency (3) 56:13;57:14;66:24 emergent (1) 54:3 empowered (1) 109:7 encapsulates (2) 82:23;85:14 encountered (1) 73:20 encourage (1) 129:25 end (13) 15:9;16:8;17:21; 25:23;28:21;30:1; 74:13;80:20;81:14; 96:5;114:13;117:8; 123:11 ending (3) 78:7,7;81:6 engineered (1) 106:14 engineering (3) 5:5;76:3;87:7 Engineers (1) 67:2 enlist (1) 129:25 enough (4) 47:11;53:13;64:5; 81:4 entail (1) 128:14 entails (1) 12:8 enterprise (2)</p>
E				
			<p>earlier (8) 10:11;32:13;57:22; 75:5;90:24;104:14; 105:7;129:6 early (3) 46:4;86:24;125:20 easiest (1) 84:18 easy (1) 93:15 eat (1) 131:19 economic (9) 18:18;19:2,15;34:2; 41:8;44:13;49:2;69:15, 18 economically (2) 45:21,22 economics (1) 52:24 economy (3) 19:18;46:11;87:23 effect (6) 34:21,25;43:24;56:5; 68:23;85:11 effective (10) 46:20,25;47:8;48:15; 52:3;91:4;98:16; 102:24;103:17;125:20 effectiveness (3) 90:24;91:1;102:23 effluent (1) 3:24 effort (2) 46:5;80:18</p>	

<p>53:24;133:6 entire (6) 17:2;40:9;59:20; 84:14;86:21;90:25 entirety (1) 70:18 environmental (1) 69:15 EPA (23) 3:15;4:15;16:13,25; 17:17;18:6;19:25; 23:14;25:7;27:12;31:9; 33:23;34:6;45:17;48:9, 19,24;55:17;77:14; 78:17,24;79:15;81:7 EPA's (1) 45:17 equally (1) 130:23 equipment (2) 101:18;115:10 equitable (2) 62:8,10 escalated (3) 7:20;13:2;82:16 escalates (1) 119:14 escalating (1) 13:4 escalation (2) 9:8;13:7 escalations (1) 57:5 essentially (28) 9:13;12:14;18:12,20; 19:16;25:3,8,25;26:18; 38:8;39:24;42:2,24; 54:2,3;58:25;65:20; 66:22;71:8;97:11; 107:18;108:13;115:5; 121:3;123:22;127:19; 128:8;134:24 established (2) 9:13;78:24 estate (2) 62:9;109:2 estimate (3) 8:2;13:5;54:12 estimated (6) 8:20;53:7;56:14; 58:11,13;61:4 estimates (1) 60:1 et (1) 10:14 evaluation (7) 6:2;92:12,14;96:12, 13,21;115:14 even (18) 6:20,20;36:20;37:15; 42:5;50:9,17;61:20; 79:3,12;107:4;111:6; 112:8;120:17;122:25;</p>	<p>123:17;131:5;135:2 event (1) 103:24 everybody (9) 2:21,23;6:25;29:25; 30:2,6;32:18;33:2; 67:11 everyone (3) 5:12;80:21;130:7 everywhere (1) 78:13 exact (1) 103:1 exactly (3) 27:8;82:21;128:2 example (10) 10:10;35:6;79:20; 84:6;90:18,21;92:6; 112:4;133:6;135:3 examples (1) 127:19 exceeds (1) 33:23 except (3) 20:4;76:25;77:2 exceptionally (1) 102:4 Excuse (1) 36:21 exercise (4) 5:24;12:2,24;15:20 exist (1) 35:3 existing (13) 14:7,10,14;59:4,14; 73:10;74:17;84:6; 101:16;119:18;120:22; 121:1,10 exists (1) 106:17 exit (1) 2:9 exits (1) 2:7 expand (3) 23:6,7;106:22 expanded (1) 23:2 expanding (1) 70:17 expect (1) 77:11 expectation (1) 76:22 expenditures (2) 4:16;59:7 expense (1) 132:20 expenses (4) 10:15;14:6;20:18; 43:16 expensive (2) 104:16;113:14</p>	<p>expertise (1) 130:6 explain (1) 134:1 explained (2) 11:18;134:4 explaining (1) 31:8 explanation (1) 78:10 exploding (1) 66:24 exploring (1) 69:22 express (1) 102:6 expressed (1) 71:2 extend (2) 36:23;67:25 extension (2) 22:24;23:3 extent (4) 55:8;71:20;92:6; 120:21 extraction (1) 88:17 extrapolating (1) 39:20 extreme (1) 44:12 extremely (2) 44:20;122:2</p>	<p>fair (4) 3:9;43:9;45:20;62:9 fairly (6) 45:3;55:16,25;86:18; 98:11;113:9 fall (2) 62:23;66:21 Falls (18) 26:21;27:19;36:18; 38:25;40:16,17,19; 60:8,17;61:3,9;100:17; 102:5;112:15;113:17; 125:19;130:17;131:6 far (5) 7:22;17:5;32:2; 66:21;124:16 fashion (1) 71:14 fast (2) 68:14;116:12 fastest (1) 12:17 fault (1) 31:15 favor (2) 115:22,23 favorable (4) 91:5;115:25;116:5; 119:7 favorably (7) 110:6;116:11; 118:11,21;122:11; 123:20,23 favorite (2) 109:3,4 feasibility (1) 72:17 feasible (2) 73:13;112:8 features (1) 68:1 February (1) 5:22 fecal (1) 76:22 federal (1) 109:6 feedback (2) 32:22;33:5 feeling (1) 83:6 fees (3) 16:7;31:19;53:25 feet (1) 68:16 fence (1) 123:13 few (7) 49:11;52:8;107:4; 108:14;110:6,19;114:9 field (19) 100:16;101:3,13,14, 23,23;102:2;105:3,9,</p>	<p>12;107:8;109:15,25; 110:10;124:12,22,25; 125:2;127:4 fields (1) 102:7 figure (11) 18:12,21;21:23; 22:12;25:16,17;34:9; 48:13;63:19;81:14; 122:24 figured (1) 21:25 figures (2) 11:2;37:13 figuring (2) 19:5;21:22 filled (1) 83:23 final (1) 12:5 finalization (1) 6:11 finally (4) 66:4,17;89:25; 101:12 finance (3) 31:18;64:24;129:13 financed (1) 56:15 financial (15) 7:1,7,10;11:21; 16:16;18:19;19:1;20:4; 21:16;28:15;30:11; 43:13;51:21;69:23; 71:13 Financing (4) 7:16;11:20;47:23; 64:12 find (9) 47:12;77:21,22; 95:23;98:6;100:10,12; 102:3;125:2 finding (1) 47:23 findings (1) 15:23 finer (1) 45:16 finish (4) 21:10;25:15;52:9; 110:8 fire (2) 2:14,15 first (19) 8:16;9:15,22;10:12; 13:4,23;18:9;19:4; 46:5;48:8;71:22;72:15, 16,80;13;84:5;96:17; 106:19;116:19;127:22 fishable (1) 77:7 fisherman (1) 131:11</p>
F			<p>faced (3) 33:3;39:6;110:13 facilities (7) 3:13,20,21;10:13; 47:9;115:5;120:18 facility (4) 8:9;13:25;120:8; 122:22 fact (11) 19:20;27:9;29:4; 33:12;43:19;63:6; 104:20;119:1;132:12, 22;135:9 factor (5) 29:2;41:12;51:3; 56:4;83:24 factored (3) 79:15;82:14;126:24 factoring (1) 57:1 factors (4) 49:2;52:24;79:25; 80:12 failed (1) 131:3 failing (1) 53:13</p>	

<p>Fisherman's (1) 130:12</p> <p>Fishing (3) 29:17;77:3;78:3</p> <p>fit (1) 91:21</p> <p>fits (1) 125:16</p> <p>five (4) 47:10;72:10;79:13; 112:23</p> <p>fix (4) 54:4,5;83:21;131:5</p> <p>fixed (3) 16:6;107:12;121:17</p> <p>flashing (1) 99:12</p> <p>flexibility (16) 48:25;93:13;94:20; 105:25;107:11;115:17; 118:5;119:5;120:20, 24,25;121:6,11,24; 122:1;124:7</p> <p>flow (10) 59:14,17;73:9;74:17; 79:7,7;103:20;106:15; 116:14;122:21</p> <p>flows (4) 22:1;105:16;115:19; 125:12</p> <p>fluctuation (1) 90:13</p> <p>focus (6) 17:3;34:1;47:13; 48:2;91:17;117:1</p> <p>focused (1) 4:3</p> <p>focuses (1) 71:4</p> <p>focusing (1) 80:3</p> <p>follow (5) 16:17;23:15;42:13; 48:20;118:20</p> <p>following (3) 17:17;20:1;35:8</p> <p>follows (1) 97:23</p> <p>follow-up (1) 10:9</p> <p>force (2) 74:17;91:22</p> <p>forcing (1) 73:9</p> <p>forgetting (1) 113:24</p> <p>forgot (1) 69:11</p> <p>formulated (1) 7:6</p> <p>forward (10) 37:21;50:13;58:22; 62:2;80:13,23;81:13,</p>	<p>13;88:12;119:21</p> <p>found (3) 2:3;61:25;84:15</p> <p>four (1) 67:14</p> <p>fragmented (1) 63:17</p> <p>frame (2) 65:9;132:16</p> <p>framework (2) 129:10;132:6</p> <p>frankly (2) 117:7;122:7</p> <p>frequent (1) 106:21</p> <p>fresh (2) 75:14;78:14</p> <p>front (6) 2:8;100:8,20;112:5; 118:13;119:9</p> <p>fruit (2) 71:25;72:2</p> <p>fruit-to-fruit (1) 111:6</p> <p>full (6) 22:15;80:8,16;88:5, 14;126:3</p> <p>fully (1) 119:25</p> <p>fund (4) 7:3;47:12;71:14; 133:6</p> <p>funding (10) 14:24;21:11;23:20, 23,24,24;51:11;63:20; 64:19;68:4</p> <p>funds (4) 13:15;15:2;67:5,6</p> <p>further (7) 3:14;4:16;50:14; 65:21;73:6;119:3,15</p> <p>future (18) 4:11;7:12;20:20; 21:8;39:21;41:4;42:8; 62:13;64:22;65:21; 84:19;87:1;93:11,19; 94:1,19;105:20;113:20</p>	<p>102:19,21;113:12</p> <p>gallons (8) 16:1,5;84:7,12;86:3; 103:23,24,25</p> <p>GARRETT (2) 25:2,2</p> <p>gas (1) 97:5</p> <p>gave (2) 12:20;76:9</p> <p>geared (1) 77:5</p> <p>Gee (2) 75:15;98:14</p> <p>general (11) 32:17,21;41:22;54:1, 6;62:1;73:17,21;74:23; 83:6;115:2</p> <p>generally (5) 38:4;73:22;74:21; 101:20;124:3</p> <p>generate (1) 45:4</p> <p>generated (1) 87:19</p> <p>geographic (1) 116:25</p> <p>gets (5) 22:15;23:2;60:16; 63:16;117:9</p> <p>given (9) 35:21;36:6;44:21; 56:22;59:23,25;60:19; 75:15;121:18</p> <p>gives (6) 89:7;119:5;124:7; 125:14;127:20;128:9</p> <p>glad (1) 30:16</p> <p>glancing (1) 15:12</p> <p>global (1) 33:18</p> <p>goal (2) 76:24;78:19</p> <p>goals (8) 71:5;76:14,15;77:12, 13;78:10;111:8;126:13</p> <p>goes (9) 11:22;29:21,24;30:1; 35:25;39:16;88:11; 96:17;131:18</p> <p>good (17) 2:6;5:3;11:10;15:22; 26:11;29:15;30:23; 45:25;47:11;50:24; 65:6;81:1,13;91:23; 109:20;128:25;131:24</p> <p>Governor (1) 129:15</p> <p>Governor's (1) 9:21</p> <p>grabbing (1)</p>	<p>34:13</p> <p>grade (3) 101:17,21;103:14</p> <p>grained (1) 45:16</p> <p>granularity (3) 38:17;39:9;52:22</p> <p>graph (4) 34:11;65:12;83:16; 125:9</p> <p>graphic (1) 14:3</p> <p>graphical (1) 111:17</p> <p>graphically (1) 45:18</p> <p>graphs (3) 17:23;111:19;113:21</p> <p>gray (7) 73:23;82:6;87:2; 88:11;90:9;125:22; 129:20</p> <p>great (3) 70:13;110:16;129:8</p> <p>greater (7) 4:18;18:16;25:12; 36:13;39:8;61:5; 131:13</p> <p>green (22) 14:8;36:1;37:1; 74:22;75:11;81:25; 82:4,4;84:24;85:14; 86:6,8,9,9;87:3,21; 91:3,21;92:25;93:9; 104:3;129:20</p> <p>greens (2) 135:1,2</p> <p>Greg (15) 5:10;6:12,14;20:3; 25:2;29:13;31:21,25; 32:11;42:12;52:9;63:1; 69:8;93:21;117:6</p> <p>ground (6) 68:13;72:1;99:7; 101:5,8,9</p> <p>group (2) 69:21;70:3</p> <p>grouping (1) 111:21</p> <p>grow (2) 41:17,18</p> <p>growing (2) 41:19,20</p> <p>growth (4) 7:12;41:8;43:19; 44:13</p> <p>GSI (43) 73:15,16,21,22,25; 74:8,10,13;75:1;82:21; 83:10,17,21;84:8,16, 23;85:9;86:12,18,19; 88:3,5,14;92:3,6;97:11, 13;98:12;100:6;112:8;</p>	<p>117:20;118:6,11,12; 125:7,8,14,15,17,20, 24;126:5,24</p> <p>guess (5) 6:6;40:2;79:25; 120:21;134:25</p> <p>guidance (5) 16:14,15;17:17; 32:18;34:5</p> <p>guys (1) 68:17</p>
H				
<p>half (6) 6:7;50:17;64:18; 80:7;88:6;95:24</p> <p>Hall (4) 100:24,25;122:1,4</p> <p>hallway (1) 2:9</p> <p>HAMBLETT (3) 129:4,4,19</p> <p>hand (7) 6:12;15:1;49:18; 69:9;92:4,5;121:20</p> <p>handle (1) 102:20</p> <p>hands (1) 52:8</p> <p>hang (1) 84:22</p> <p>hanging (1) 71:25</p> <p>happen (3) 42:9;46:9,11</p> <p>happened (2) 26:1;127:15</p> <p>happening (10) 16:4;24:2;33:18; 35:20;39:12;47:22; 58:7;63:15;64:4,9;8</p> <p>happens (1) 30:1</p> <p>happy (1) 87:9</p> <p>hard (7) 44:7;47:1,3;77:22; 91:9;92:4,7</p> <p>harder (1) 38:12</p> <p>Harold (2) 10:25;105:7</p> <p>hat (1) 109:5</p> <p>hats (1) 84:22</p> <p>headroom (1) 122:24</p> <p>hear (9) 5:12;46:7;78:9; 79:23;95:8;104:7; 120:12;126:14;133:4</p>				

<p>heard (2) 6:23;83:3</p> <p>heavily (3) 77:8,9;104:21</p> <p>heavy (1) 10:18</p> <p>height (2) 13:19;15:15</p> <p>held (1) 70:22</p> <p>help (5) 34:9;105:19;128:2; 130:1,7</p> <p>helpful (1) 2:20</p> <p>helping (1) 135:8</p> <p>Here's (4) 14:3;34:11;51:23; 52:15</p> <p>Hey (2) 51:24;128:3</p> <p>high (13) 18:17,24;25:13; 27:14;43:7;100:15,16, 17;104:16;112:9,18; 113:10;123:21</p> <p>higher (8) 13:6;28:12;61:18; 110:5;115:7,20,24; 132:20</p> <p>high-level (1) 23:15</p> <p>highlighted (1) 93:8</p> <p>highway (1) 108:19</p> <p>hikes (1) 35:22</p> <p>Hill (11) 49:19,19;56:23,23; 57:7;58:20,20;59:6; 69:2;103:21,21</p> <p>historical (1) 15:25</p> <p>hit (2) 50:15;59:24</p> <p>hits (3) 57:19;60:1,21</p> <p>hold (10) 41:21;52:7,8;69:8; 75:16;86:25;95:13; 96:4;114:23;123:5</p> <p>hole (1) 96:1</p> <p>holes (3) 48:4;87:7,8</p> <p>holistic (1) 103:13</p> <p>HOLMES (7) 29:16,16;68:8;73:15; 130:10,12;131:22</p> <p>home (2)</p>	<p>30:21;72:5</p> <p>homes (1) 79:20</p> <p>honestly (1) 93:6</p> <p>Hopefully (1) 46:22</p> <p>hoping (1) 84:2</p> <p>horizon (1) 56:3</p> <p>horizontal (1) 97:20</p> <p>horsepower (1) 129:24</p> <p>hour (2) 95:24;135:17</p> <p>hours (2) 110:23;134:16</p> <p>house (2) 62:10;101:19</p> <p>household (34) 17:6,18;18:13,14; 19:8,22;20:7,10,11; 21:23;22:13;24:9,9,13, 14;25:19;26:22;27:4; 29:8;31:1;34:15;35:10; 36:14;39:21;40:4;41:1; 50:10,13,20;52:19; 57:25;60:20;61:15; 132:10</p> <p>households (33) 17:11,13;22:7,17; 23:1,5;24:8;27:19,21; 36:13,15,16;38:14; 39:13,15,18,21;40:9, 11,13,20,22,25;43:3; 52:17,20;57:24;58:8,9; 60:6;61:4,12,21</p> <p>houses (1) 108:14</p> <p>huge (5) 34:17;84:12;85:5; 88:23,24</p> <p>hundred (1) 81:11</p> <p>hung (1) 135:5</p> <p>hybrid (12) 73:15,25;97:10; 98:18,23;113:8,13; 115:12,21;116:10; 118:2;126:20</p> <p>hydraulics (1) 90:15</p>	<p>63:12</p> <p>identified (1) 86:12</p> <p>ignores (1) 34:20</p> <p>II (12) 8:17;13:1,25;18:18; 19:1;28:6,22;52:12; 55:20;127:14,20;134:7</p> <p>III (30) 5:6;8:19;9:1,5,23; 10:20;11:2,8,24;12:3, 18;13:21,25;20:21,24; 21:1,3,6,11;22:15,25; 24:11;32:4,10;52:12; 59:10;65:9;96:11; 126:23;128:13</p> <p>illustrate (3) 34:12,23;58:6</p> <p>illustrations (1) 17:23</p> <p>imagine (1) 77:22</p> <p>impact (15) 18:10;33:16;34:9; 35:13;46:15;52:25; 54:21;69:18;70:7; 80:23;83:17;84:3,4; 101:25;107:17</p> <p>impacted (1) 135:1</p> <p>impacts (11) 51:6;55:3;62:2; 90:22;96:14;105:11, 13;119:20;120:4; 124:2;127:21</p> <p>implement (1) 93:15</p> <p>implemented (3) 4:13;81:2;111:10</p> <p>important (13) 48:7;69:13;75:18; 76:18;79:24;83:24; 85:12;86:4;87:14; 88:11;90:9,10;113:20</p> <p>impossible (2) 73:14;108:21</p> <p>improve (1) 117:19</p> <p>improvement (4) 8:14;54:10;55:15; 66:19</p> <p>improvements (5) 8:9;21:5;58:14;97:8; 117:16</p> <p>imputed (1) 26:8</p> <p>inaudible (20) 22:16;30:12;40:4; 48:20;55:19;76:20; 79:5;85:1,11;87:7; 92:10;93:8,10,12; 99:21;107:9;109:24;</p>	<p>116:1;125:13;126:10</p> <p>inaudibly (1) 77:10</p> <p>include (6) 13:11;20:13;48:13; 54:9,14;57:11</p> <p>included (5) 22:17;23:2;24:14; 39:4;84:24</p> <p>includes (5) 20:17,21;25:21; 96:13;118:6</p> <p>including (8) 3:25;10:11;24:24; 47:15;75:13;103:8; 104:2;127:13</p> <p>income (38) 17:4,6,15,18;18:14; 19:9,22;20:7,11;24:13; 29:9;33:11;34:15,17, 18,20,24;35:3,8,17; 36:14;37:18;39:22; 41:1,19;43:2;50:10,13, 15,16;52:20;57:25; 60:20;61:9,21;62:12; 63:8;132:12</p> <p>incomes (2) 24:15;132:10</p> <p>incompatible (1) 124:22</p> <p>incorporated (1) 10:15</p> <p>incorporating (1) 118:12</p> <p>increase (11) 12:22,22;15:10; 16:11;36:11;41:10,11; 57:5;62:22;65:8;130:3</p> <p>increased (1) 30:22</p> <p>increases (7) 11:12;14:17,22; 19:19;30:11;45:6;58:2</p> <p>increasing (2) 14:10;94:7</p> <p>incurred (1) 26:2</p> <p>index (5) 17:25;36:3,6;50:25; 57:17</p> <p>indexed (1) 36:2</p> <p>indicate (1) 19:16</p> <p>indication (1) 29:15</p> <p>indicative (2) 87:25;135:4</p> <p>indicator (5) 20:8;25:3;28:9,15; 91:18</p> <p>indicators (9) 18:9,19,19;19:1,2,</p>	<p>15;28:6,22;34:2</p> <p>indirectly (1) 29:3</p> <p>individual (6) 67:8;68:10;73:1,4; 75:22;90:2</p> <p>industrial (4) 42:20,22;108:13; 120:17</p> <p>industrialized (1) 77:8</p> <p>industry (3) 8:4;50:21;130:24</p> <p>inexpensive (1) 107:6</p> <p>inflation (5) 36:8;40:1;42:4,4,7</p> <p>inflationary (2) 36:9;41:12</p> <p>influence (2) 85:5;87:1</p> <p>inform (2) 75:1;128:3</p> <p>information (3) 48:12;55:12;56:11</p> <p>infrastructure (32) 8:12;20:14;21:7; 47:2,25;51:10;53:3; 56:14,20;58:13,13; 60:10,19,23;73:23; 74:22;75:12;85:14; 87:22;91:9;92:4,8,22, 25;93:9;105:22; 109:19;110:14;123:9; 129:20,21;133:2</p> <p>initial (1) 94:22</p> <p>initiation (1) 127:22</p> <p>inland (2) 94:7,7</p> <p>innovation (1) 94:8</p> <p>innovative (1) 47:20</p> <p>inspection (1) 67:22</p> <p>installation (2) 99:19;105:11</p> <p>installed (1) 3:21</p> <p>instance (4) 73:24;84:5;97:17; 100:6</p> <p>instances (1) 101:15</p> <p>instead (2) 65:15;111:20</p> <p>instinctively (2) 29:10;128:3</p> <p>institutional (1) 118:23</p> <p>insulated (1)</p>
---	--	--	--	---

<p>101:7 integrated (1) 65:24 integrating (1) 111:13 intensity (1) 94:7 intent (1) 66:8 interceptor (30) 8:14;12:14;73:10; 74:18;76:6;97:17,18; 98:22;104:15,17,18; 105:3,18,20;109:19; 112:13,20,25;115:15, 24;121:2,10,19; 122:19;123:10,12,19; 124:16,18;125:12 interceptors (9) 9:7;12:9;59:19;73:6; 99:17;104:10;114:9; 120:22;123:15 inter-disbursed (1) 100:9 interest (1) 110:19 interested (3) 5:12;38:11;45:15 interesting (9) 14:3;34:11;41:6; 67:1;86:16;88:9; 111:21;114:16;128:5 interfering (1) 109:15 interim (8) 4:7,20;111:9;119:24; 120:7;122:17;123:10; 127:5 interlocking (1) 86:20 internal (1) 117:23 Internet (1) 88:21 interpret (2) 25:16,17 interpreted (1) 25:18 interrupt (1) 48:19 INTERRUPTION (4) 3:7;33:20;133:24; 134:20 interspaced (1) 86:20 into (50) 5:15;7:6,18;9:3; 16:12;17:4,14;20:5; 27:10;29:14,18;34:21, 25;35:8,20;36:4;38:16, 23;39:1,8,25;41:3; 42:25;43:19;52:23; 56:5,10;57:15;58:5;</p>	<p>59:2;61:8;63:23;65:18, 21;66:21;68:23;77:7; 79:15;82:1;85:10,15; 87:6;96:18;99:12,24; 102:14;103:4;109:22; 118:12;120:22 introducing (1) 85:9 inundation (1) 92:23 investing (1) 69:17 investment (1) 81:1 investments (1) 46:17 invitation (1) 48:24 involved (1) 88:15 IPF (1) 34:5 Island (9) 7:16;21:16;29:17; 67:2;94:17,25;130:12; 131:19;132:4 issuance (1) 7:23 issue (12) 3:10,16;14:12;17:5; 31:17;33:1;34:23;39:5; 70:6;106:19;119:19; 131:14 issued (1) 4:5 issues (5) 5:1;33:4;34:2;53:8; 97:25 issuing (2) 14:13;15:2 items (1) 21:5</p>	<p>judged (1) 82:5 jump (2) 15:24;39:23 June (1) 6:2 jurisdiction (1) 63:13 justify (1) 46:17</p> <p style="text-align: center;">K</p> <p>KARP (26) 12:19,19;22:6,6,14, 23;31:3,3;32:6,16; 39:20;40:4,23;42:13; 76:7;77:16,23;79:3,18; 106:5,24;107:2,25; 108:24;109:23;116:12 K-A-R-P (2) 12:19;22:6 keep (4) 26:12;38:1;66:23; 133:20 key (4) 6:23;7:10;20:2; 46:22 kick (1) 12:15 kicked (1) 5:22 kickoff (1) 103:14 kids (1) 125:3 kill (1) 77:18 kind (73) 6:25;7:6;8:3,18,19; 9:13;11:13,25;13:17, 19,21;15:6,19,21;16:3, 5,17,2;23:15;33:22; 34:1;35:25;36:1,2,5, 10;39:11;40:3,14; 41:20,21,22;43:5,6,18; 44:5;48:16;50:14;51:4; 52:4,11,13;54:8;56:17; 57:17;58:1,6,17,18; 59:22;60:3,5,8,20;61:2, 11,13,14,22,24;62:1; 67:2,18;71:10;73:25; 82:10;83:7;85:21;87:5, 25;108:3;110:9; 121:23;129:23 knew (1) 65:5 knocked (1) 72:18 knocks (1) 122:7 knowing (2) 55:19;111:4</p>	<p>known (2) 101:6;103:2 knows (1) 67:11 Kurt (2) 134:21,21</p> <p style="text-align: center;">L</p> <p>labor (1) 115:10 lacks (1) 116:9 ladies' (1) 2:5 laid (1) 103:7 Lance (4) 49:19;56:23;58:20; 103:21 land (2) 55:20;102:10 landfill (2) 101:12;106:10 landlord (2) 27:5;29:20 language (1) 76:20 large (13) 13:4;38:7;50:4;58:3; 60:8;75:13;84:4,5; 107:3;108:8;113:15; 120:17;128:6 largely (3) 104:18;113:22;131:1 larger (4) 71:11;90:1;125:6,22 Las (1) 91:15 last (21) 3:11;5:15,17;8:16; 10:1;11:3;47:10;62:3; 69:12;72:13;79:13,20; 87:13;96:8;100:13; 101:4;102:1;111:14; 116:21;123:7;134:9 lasts (1) 93:20 late (4) 7:14;75:5;81:21; 86:25 later (3) 47:5;92:2;94:10 lawyer's (1) 109:5 layering (1) 132:23 lead (2) 5:2;48:23 leading (1) 31:23 league (5) 100:16;101:14;</p>	<p>105:12;110:17;124:23 least (4) 31:7;37:6;115:25; 124:5 leave (4) 70:11;91:24;133:19; 134:5 left (3) 10:21;48:4;72:20 Legal (1) 124:22 legislation (1) 85:4 length (4) 53:6;54:11;97:20; 104:19 lengthening (1) 70:15 less (23) 18:14;29:7,19,23,24; 30:2,12,20;35:1,9; 36:2;43:21;50:17; 61:16;68:15;77:6; 98:22;115:2;118:11; 119:5;124:12;126:15, 15 level (19) 10:13;17:14;27:15; 30:19;39:1,8;41:19; 52:22;57:13;60:24; 81:5;83:5;90:10;94:2, 3,6;123:2;129:13; 131:25 liability (1) 7:25 LIBERTY (6) 80:6,6;133:22,25; 134:1,12 life (3) 67:23,25;85:5 lifespans (2) 89:2,3 light (3) 36:1;37:1;112:12 lightly (1) 109:10 liked (1) 63:6 limit (2) 121:23;130:5 limitations (1) 121:9 limited (3) 72:20;105:10;129:10 limits (4) 3:24;4:1,1;121:18 Lincoln (4) 61:8,20;62:21;70:11 line (5) 34:14;54:2;56:24; 67:12;123:13 lines (6) 10:19;44:22;67:22;</p>
	J			
	<p>Jan (12) 9:21;46:3;69:9,10; 70:12,23;71:21;74:20; 81:25;82:21;114:23; 129:6 J-A-N (1) 9:22 Jared (1) 13:9 job (2) 132:13,13 jobs (1) 43:4 John (2) 37:3;93:21 Jon (6) 6:15;15:24;16:12; 18:3,4;117:6</p>			

108:4;112:22;113:23 lion's (1) 73:1 listed (1) 103:23 lists (1) 99:19 little (43) 2:16;6:18;8:15;13:6; 14:11,13;15:21;18:2; 27:10;30:25;33:1;35:9; 44:9;48:2;49:21;70:12, 16;74:25;81:18;86:22, 24;87:6;89:5;90:24; 91:20;94:9;96:24;98:6, 8,15;100:15;101:14; 103:6;104:8;105:11; 110:16;118:10;120:24; 124:22,23;127:2; 130:21;132:6 live (2) 107:25;108:11 living (4) 29:4,7;61:8;77:18 loading (1) 135:6 loan (1) 7:22 loans (4) 7:17;21:13,16,20 loath (1) 71:9 locality (2) 130:15,25 localized (1) 85:1 location (10) 73:7;99:16;100:4; 102:3;105:15;119:23; 123:11;124:11,20; 125:2 locations (9) 6:1;99:15;100:10; 103:2;110:3;115:4; 119:14;121:4,8 long (4) 25:8;68:15;93:8; 124:23 longer (2) 93:2;110:23 long-term (6) 7:7;8:22;78:19; 111:11;120:1,9 look (76) 6:1;7:10;8:6;12:3; 14:17;16:3,14;19:6; 20:23;21:11;22:4; 23:11;24:12;27:11,11, 14;28:5,6,8,10,13,16; 34:7;35:4;36:16;39:4, 11;41:13;43:1;45:21, 22;48:14;50:9,21;51:5; 52:2,2,13,17,22;53:5,7;	54:14;56:6;70:3,5; 71:17;75:9,14;81:9,19; 83:25;85:20;92:11; 96:10;97:21;98:2,5,13; 102:13;104:25;105:4; 106:14;107:3,7;108:1, 9;112:17;113:11,21; 116:15,18;124:3; 125:9;132:17,23 looked (12) 12:7;20:21;28:9; 30:10;43:16;49:5; 83:12;84:23,25;88:21; 96:8;116:13 looking (40) 7:8,12,25;11:19; 14:1,25;19:5;23:19,21, 25;24:10;36:12;41:3; 42:8;47:22;51:7;55:1, 2;61:11,22;62:7;69:25; 76:12;80:2,14;85:12; 88:2;91:18;92:10; 108:5;109:24;113:20; 115:13;116:16;125:15; 128:15,16;131:11; 133:13;134:2 looks (10) 2:22;18:1,10;31:10, 15;40:23;93:19;106:6; 107:5,8 loosely (3) 25:15,16,17 lose (2) 42:21;132:11 lost (1) 43:4 lot (41) 3:10;5:1;8:1;14:17; 20:25;29:14;33:6;43:1; 44:17;46:9;47:15,18; 50:16,23;53:23;61:18; 69:24;70:21;72:17,18; 75:9;82:5;86:17;88:23; 89:13;93:9;100:19,20, 25;101:24;102:3,25; 106:12,18;110:12; 113:13;118:25;120:25; 126:6;129:8,8 lots (2) 106:9;122:1 louder (1) 2:16 love (1) 70:1 low (7) 18:15,24;43:7;61:21; 98:11;105:9;113:9 lower (6) 28:14;29:5;55:16; 60:19;92:7;124:9 lowest (2) 71:25;110:2 low-hanging (1)	72:2 lump (1) 89:5 M machine (1) 68:13 main (3) 97:5,5;99:17 maintain (3) 44:3;115:8;128:19 maintained (1) 133:3 maintaining (1) 55:14 maintenance (7) 7:4,20;8:5;14:6; 43:16;58:12;67:24 major (2) 8:7;13:1 majority (2) 30:21;80:21 makes (7) 65:10;76:13;87:9; 98:8;103:17;104:11; 116:24 making (7) 36:18;44:16;46:17; 61:15;74:22;106:16; 109:12 manage (1) 68:16 management (5) 8:12;21:7;56:6;67:7; 68:2 manager (1) 5:4 mandate (1) 79:2 maneuver (1) 84:19 manifested (1) 66:23 many (9) 23:1;38:13,14;63:11, 12;81:24;82:23;95:12; 135:10 map (9) 37:9;52:13;58:5; 60:5;61:1;76:9;77:11; 106:7;113:22 maps (2) 45:4;108:25 market (3) 7:19;28:16;120:13 maroon (1) 134:24 marque (1) 126:23 mature (1) 84:15 max (1)	126:1 maximize (1) 21:13 maximum (2) 62:21;64:12 May (15) 5:23;10:11;29:5; 37:9;50:5;54:24;62:12; 83:25;96:5,24;109:11; 116:15;121:19;132:25, 25 maybe (21) 11:18;37:8,22;44:15; 47:1;50:24;56:6,12; 62:23;63:10;67:14; 75:4;82:13;89:25;90:1; 92:1;96:4;110:5; 120:23;124:23;126:1 Mayors (6) 33:2,9,25;62:7;63:6, 11 Mayors/Mayors (1) 63:4 mean (15) 12:12;15:6;25:22; 30:6;32:14;36:22; 38:10;45:8;51:18;69:9; 82:17;110:9;114:18; 130:2;131:15 Meaning (1) 10:6 means (5) 72:23;84:23;86:14; 93:22;113:5 meant (2) 49:22;85:17 measure (2) 25:7;117:16 measurement (3) 19:25;26:18;27:13 measures (1) 111:7 measuring (1) 16:21 mechanism (2) 51:11;63:20 mechanisms (1) 47:24 median (16) 18:13;19:8,17,22; 20:6,11;24:13,14,23; 25:11;29:8;34:14; 37:18;41:1;50:10; 132:9 medium (10) 17:6,8,18;18:24; 36:14;43:7;52:19; 57:25;60:9,19 meet (10) 3:25;48:11;52:4; 53:18;77:13,15;78:19; 79:8;89:24;95:5 MEETING (15)	2:1;3:11;5:2,20; 66:11,16;80:3,8,8; 103:15;110:22;117:1; 133:21;135:16,19 meetings (4) 6:17;31:14;44:4; 95:21 meets (3) 33:23;74:15;81:12 Meg (1) 134:21 member (3) 38:23;52:17,18 memory (1) 117:13 men's (1) 2:4 mention (1) 4:19 mentioned (4) 4:23;66:20;126:25; 129:6 message (1) 86:13 messaging (1) 107:19 met (3) 4:8,10,14 meter (1) 43:20 methodology (5) 16:25;33:10;45:18; 48:21;63:3 metric (1) 85:21 metrics (1) 18:20 MHI (5) 19:9;22:12;24:19; 28:13;29:4 Michael (3) 49:16;62:20;70:10 mid (8) 18:16,22;19:6;28:15, 17,18;29:9;44:5 Middle (2) 104:17,23 midpoint (2) 35:18;61:11 midrange (2) 28:23;89:12 midst (15) 14:18;15:20;42:7; 45:15,20;49:25;52:25; 67:21,24;92:25; 107:18;110:15;114:2; 120:14;135:17 Mike (3) 11:15;70:20;132:3 miles (1) 53:10 mill (1) 106:9
---	---	--	---	--

<p>million (39) 8:10,16,18,23;10:23; 11:5,7,8;12:20;13:3; 14:2,20;13,16,17,19, 22,24;21:4,23;17,18, 19,25;24:2,7,44;16; 57:11,12;58:14;59:8; 64:21;71:24,24;84:7, 12;86:3;88:4;103:22, 24,24</p> <p>millions (1) 112:3</p> <p>Mills (3) 100:17;112:18; 123:16</p> <p>mind (2) 26:12;38:1</p> <p>minds (2) 16:23;129:9</p> <p>minimal (1) 72:3</p> <p>minute (3) 32:23;33:5;107:15</p> <p>minutes (3) 4:23;68:6;72:9</p> <p>minutia (1) 82:18</p> <p>misconception (3) 93:24;94:4,5</p> <p>misleading (1) 38:4</p> <p>misnomer (1) 49:21</p> <p>missed (2) 31:14;32:7</p> <p>missing (4) 32:25;50:2;91:7; 132:21</p> <p>mistaken (1) 47:22</p> <p>mitigate (1) 124:2</p> <p>mix (4) 14:24;16:9;23:20; 126:19</p> <p>mobilization (1) 69:1</p> <p>model (24) 7:7;11:21;21:14,19; 25:19,24;30:11;38:15; 45:5;51:21,22;57:15; 64:1;65:7,19;71:10,16; 127:10;134:2,7,8,10; 135:4,7</p> <p>models (5) 35:21;44:24;47:25; 64:4;127:18</p> <p>moderately (2) 99:24;128:6</p> <p>Moderator (1) 128:24</p> <p>modest (2) 26:9;120:16</p>	<p>modifications (2) 73:8;74:17</p> <p>moment (4) 31:9;88:2;94:12; 100:23</p> <p>money (3) 54:4;110:13;131:15</p> <p>monies (1) 47:21</p> <p>month (9) 5:15,17;6:7;72:13; 96:8;101:4;111:14; 116:21,22</p> <p>more (65) 8:15;14:13;27:10; 29:18,22,22;30:6;33:1; 43:2,3;45:1;46:6,7; 47:20;49:11;53:11; 56:2,9;62:9;64:9,23; 66:17;67:15,23;68:16; 69:10;70:4,5,16;71:17; 73:6;75:21;78:9;81:2; 86:22;89:16;93:2; 95:14;97:19;98:15; 102:23;104:16;105:5; 107:24;110:6,19; 111:15;112:19;113:13; 115:8;116:11;117:10, 12;118:10;119:4; 120:16,24;121:25; 123:2;125:13;126:14; 127:2;130:8;132:2; 135:3</p> <p>Moreover (1) 106:22</p> <p>Morley (8) 101:13;105:3,9; 107:8;109:25;124:12, 25;127:4</p> <p>morning (1) 5:3</p> <p>Moshassuck (8) 75:23;101:14; 104:19;106:6;108:4,8; 123:25;128:7</p> <p>most (10) 46:25;48:14;53:11; 69:14;75:24;98:9; 108:15;117:9;118:18; 128:10</p> <p>mostly (1) 70:22</p> <p>move (12) 6:10;39:16;45:25; 58:22;62:2;80:12,22; 81:13,21;96:6;123:11; 131:21</p> <p>moved (2) 42:25;61:8</p> <p>moves (1) 127:24</p> <p>moving (7) 26:18;68:13;83:10;</p>	<p>98:24;118:13;123:15; 125:4</p> <p>MPN (6) 76:23;77:5,6,18; 78:11,12</p> <p>much (19) 21:13;29:7;41:15; 54:6;67:23;68:21;71:4; 83:2;87:4,5;89:12; 91:15;95:7;102:9; 107:23;109:20;121:8; 123:17;129:1</p> <p>multi-forcated (1) 114:6</p> <p>municipal (4) 7:18,22;13:15;15:2</p> <p>municipalities (5) 14:18;53:23;59:21; 62:14;67:4</p> <p>municipality (2) 37:19;66:22</p> <p>muriate (1) 8:12</p> <p>must (1) 15:12</p> <p>MWH (8) 5:4,4;6:15;9:3;18:5; 33:8;37:3;81:24</p> <p>myself (2) 87:12;95:23</p>	<p>58:17;59:18,24;60:16, 21;62:14;63:22,23; 64:2,12,24;65:3;78:23; 124:9;130:7</p> <p>NBC's (5) 7:1;38:20;52:16; 53:2;119:3</p> <p>near (9) 4:12;74:7;98:25; 99:22;102:17,21; 107:25;108:21;118:18</p> <p>near-surface (3) 106:4;118:22;120:18</p> <p>necessarily (10) 16:19;43:17;45:16; 50:6;63:19;79:15; 82:17;84:13,24;89:24</p> <p>necessary (3) 3:24;14:24;70:9</p> <p>need (51) 2:2,17;4:10;10:17, 21;11:10;14:23;16:22; 25:4;33:6;34:7;47:19; 48:1,13,16,16;52:22; 53:20;54:8;56:9;60:10, 17,18;61:6;62:5;63:23; 67:6,9;69:5;74:13; 75:18;93:25;95:5; 99:23;100:1,1,2,6; 101:19;104:10;105:22; 114:18,20;127:1; 129:23;130:4,25; 131:8,14,24;133:12</p> <p>needed (4) 46:20;52:6;56:16; 69:6</p> <p>needs (14) 14:20;48:19;52:4; 53:4;54:10;55:7;56:1, 2,7;73:22;94:21,22; 126:22;129:16</p> <p>negative (2) 45:25;109:17</p> <p>negatives (1) 120:3</p> <p>negotiate (1) 65:24</p> <p>negotiations (1) 65:14</p> <p>neighborhood (4) 108:10,13;117:21; 118:1</p> <p>neighborhoods (3) 33:13;99:25;117:17</p> <p>net (3) 19:6;28:8;41:12</p> <p>netted (1) 41:18</p> <p>network (2) 74:18;98:10</p> <p>neutralize (1) 41:15</p> <p>new (9)</p>	<p>2:11;17:9;42:25; 59:13;88:23;97:1; 129:15,15,25</p> <p>Newport (2) 131:15,16</p> <p>next (24) 5:19;8:13;16:12; 33:21;35:24;39:10; 52:21;55:20;66:9,11, 16;72:8;75:2;81:17,20; 91:14,20;92:23;94:4; 103:12;117:1;128:22; 132:5;135:16</p> <p>nically (1) 82:1</p> <p>Nick (6) 74:25;81:23;95:14; 97:12;104:2;125:10</p> <p>nine (1) 84:10</p> <p>noble (1) 47:15</p> <p>nobody (1) 30:5</p> <p>non (1) 21:5</p> <p>nonetheless (4) 14:12;45:4;51:4; 60:15</p> <p>nonresidential (1) 132:8</p> <p>norm (1) 42:3</p> <p>North (1) 29:6</p> <p>note (2) 90:13;113:7</p> <p>notes (1) 15:13</p> <p>notice (3) 84:2;87:17;90:11</p> <p>November (13) 5:20;6:11;66:11; 74:25;75:3;95:25; 114:21;127:3,7,9,25; 129:17;131:24</p> <p>nub (1) 70:24</p> <p>number (45) 13:24;16:24;22:4,7, 8,9;23:5;24:14,16; 26:16,17;27:23;33:19; 36:20;38:5,8,11;39:16; 40:25;44:10,10;52:20; 57:24;61:7;63:4;68:5; 72:20,24;73:5,8;74:12, 25;77:24;83:22;89:20; 90:20,21;96:2;99:4; 103:16;115:3;120:3; 122:6;125:18;126:5</p> <p>numbers (25) 20:23;23:12;28:1; 29:19;35:1;36:9;54:18;</p>
N				
		<p>nail (1) 116:25</p> <p>name (10) 2:18,23;3:6,8,6;14; 9:22;18:4;81:23;101:2; 130:11</p> <p>Namely (1) 105:18</p> <p>Narragansett (13) 46:21;47:7;59:9; 69:13;76:11,17;77:1; 78:8;130:5,20;131:9, 11,17</p> <p>narrative (1) 4:1</p> <p>nation (1) 33:3</p> <p>national (7) 13:6;19:8,9;28:11, 14;75:10;94:25</p> <p>nature (2) 82:22;106:21</p> <p>NBC (46) 7:25;10:6,7,21;14:4, 20;20:16;21:7,25;23:4; 24:16,23,25;27:19,22; 28:9;30:3;32:15;34:16; 38:18;39:7,15;40:11, 18;43:10;44:4;50:6; 55:10;56:18;57:17,18;</p>		

<p>65:5;70:25;71:1;82:15; 83:20;85:15,25;86:3; 88:10,14;89:8,18; 91:17;104:2,2,7,8; 111:18 numeric (1) 4:1 numerous (1) 78:18 nuts (1) 18:6</p>	<p>37:6;38:9;45:7,10; 46:11,22;50:2;52:5; 68:7,8,11;69:8,10,10; 75:21;76:1;80:15; 81:11;85:18;89:14; 92:4,6,18;94:4;95:13, 14;96:18;97:15,17; 101:4,13,20;104:14; 105:11;106:23;109:1; 111:22,22;112:3,15; 113:6,7,19;115:5; 116:24;117:9,12; 119:21;122:5;123:7, 22;127:22;128:5; 129:14;130:11,13,14, 22;131:7;132:2</p>	<p>75:6,7;77:24 opportunities (3) 74:1,3;83:12 opportunity (3) 75:9;108:7;126:7 opposed (3) 115:5,18;124:10 opposite (2) 39:24;118:2 optimization (1) 125:17 option (4) 98:22;106:4,14; 122:16 options (8) 6:19;44:19;49:4; 69:23;70:1;115:9,12; 127:6 orange (1) 112:4 order (1) 128:17 original (1) 16:15 originally (1) 12:20 OSTPA (2) 8:24;15:4 others (4) 33:9;90:4;115:21; 117:5 otherwise (1) 29:3 ought (1) 77:10 ourselves (1) 130:5 out (88) 2:4,5,8,8;6:25;8:19; 10:20;11:16,22,25; 13:18;15:21;18:12,21; 19:5;21:22,23,25; 22:12,16;23:9;30:17; 32:13;34:6,9;35:23; 36:8,15;39:12;41:7,13, 14,18;45:3;46:9;48:3, 13;50:14,18;51:19; 54:1;55:17,17;56:3; 60:16;61:1,2,23;62:5; 63:19;65:20;68:25; 69:3,4,18;72:18;77:21; 78:3;81:11,14;84:12; 86:7,17;87:20;91:24; 97:12;99:7;102:11; 103:7,14,19;105:5,7; 113:13;115:14,24; 116:4,10;118:3,11,15; 119:3,3;122:24; 123:19,23;124:4; 130:18 out-area (1) 121:18 outer-lying (1)</p>	<p>38:7 outfall (3) 76:19,23;77:4 outfalls (2) 77:16;103:17 outflow (1) 78:4 outlay (1) 23:25 outlays (1) 20:19 outlier (2) 75:24;76:2 outlined (4) 18:7;23:14;25:7; 87:15 outlying (1) 55:9 output (3) 90:17;134:7,11 outputs (1) 127:19 outside (2) 69:21;95:6 outstanding (1) 128:20 over (37) 6:12;8:10,14;14:19; 15:14;16:11,13;18:3; 20:3;23:16;36:11;41:3, 14;57:5;58:2,4;60:4; 62:15;63:22;65:13,17; 76:23;87:2;88:4;89:2, 5;99:8;101:23;104:20; 106:12,17;108:18; 123:6;127:21;128:22; 129:3;132:1 overall (10) 9:24;60:20;62:2; 91:22;95:11;96:11; 98:1,21;113:8;116:24 overflow (3) 84:5,14;113:1 overflows (6) 55:11;77:25;83:18; 84:13;85:9;130:17 overlay (1) 36:22 overlays (1) 45:13 owned (1) 106:19 owners (1) 110:4</p>	<p>par (2) 5:5;53:1 parameters (2) 44:22;86:7 park (1) 100:21 parking (9) 3:10;5:1;100:18,20, 25;101:24;102:3; 106:9,18 parsed (1) 103:19 part (21) 13:4;21:22;32:2; 34:4;49:3;55:9,10; 57:10;66:16;68:20; 69:12;72:10,13;86:8, 14;87:4;93:11,17;94:1; 133:10;135:12 partially (1) 104:18 particular (9) 48:21,22;69:21; 85:10;86:5;109:24; 118:12;123:25;133:15 particularly (3) 65:8;82:9;102:7 PARTRIDGE (4) 26:20,20,25;27:5 pass (1) 31:21 past (2) 95:21;134:9 pathway (1) 48:22 Pawtucket (26) 36:17;38:25;40:15, 21;49:17,20,25;56:24; 58:11,21;59:22,25; 75:23;100:21;102:6; 103:22;104:15;105:2; 106:8;113:16;118:16; 122:3;124:16;126:22; 130:16;131:6 Pawtuxet (3) 130:19;131:3,7 pay (9) 20:18;21:12;30:6; 47:21;54:4;70:7; 107:20;129:11;132:17 payer (2) 129:11;133:8 payers (1) 50:6 PAYGO (1) 13:15 paying (4) 27:6;47:24;132:16, 18 payment (1) 24:1 peaking (1) 40:10</p>
O				
<p>obscure (1) 71:20 observation (1) 69:12 observations (1) 46:4 obtaining (1) 111:8 obviously (7) 11:22;14:4,20;60:24; 85:17;88:8;113:10 occasion (1) 107:20 occurring (3) 4:17;34:3,18 occurs (1) 17:16 odor (2) 100:1;115:4 off (17) 5:9,15,22;12:15; 14:11;80:17;81:17,18; 87:12;89:6,9;114:9;93:6; 95:16;104:14;105:2; 111:11;123:5 offer (2) 92:7;93:12 offering (1) 95:11 offers (2) 86:23;92:6 Office (1) 9:22 offing (1) 71:10 Often (2) 97:8;133:4 old (4) 45:8;59:15;101:12; 106:10 once (11) 14:25;36:10;54:11; 58:17;59:23;68:12; 83:23;92:19;116:25; 119:13;121:13 one (74) 2:7;3:10;5:7,8;6:1,4; 18:15;22:7;24:2;25:11; 26:15;30:5,18;34:23;</p>	<p>one-issue (1) 92:20 ones (12) 29:24;38:12;73:13; 85:8,19;101:2;102:19; 103:12;104:16;117:4; 123:17;128:6 one-time (1) 83:21 only (37) 3:22;4:6;9:23;10:4; 16:16;19:20;23:5; 37:13;38:18;39:6; 54:25;55:14;59:24; 60:21;78:22;79:13; 80:15;83:21;84:8; 85:16,18;86:8,11;88:3, 18;93:1;94:2,4,6,12; 95:7;96:15;105:16; 111:4;120:22;133:7; 135:17 onto (1) 118:13 Oops (1) 47:11 open (6) 62:4;72:1;100:23; 102:9;106:12;109:16 opens (1) 48:9 operate (5) 115:8;118:8;119:4,5; 124:9 operated (1) 119:2 operating (2) 89:11;129:10 operation (1) 121:23 operational (7) 115:16,17;118:5,25; 119:19;121:5;124:7 operations (9) 7:4,20;8:4,9;24; 14:6;43:15;120:3; 121:7,7 opinion (3)</p>	<p>OSTPA (2) 8:24;15:4 others (4) 33:9;90:4;115:21; 117:5 otherwise (1) 29:3 ought (1) 77:10 ourselves (1) 130:5 out (88) 2:4,5,8,8;6:25;8:19; 10:20;11:16,22,25; 13:18;15:21;18:12,21; 19:5;21:22,23,25; 22:12,16;23:9;30:17; 32:13;34:6,9;35:23; 36:8,15;39:12;41:7,13, 14,18;45:3;46:9;48:3, 13;50:14,18;51:19; 54:1;55:17,17;56:3; 60:16;61:1,2,23;62:5; 63:19;65:20;68:25; 69:3,4,18;72:18;77:21; 78:3;81:11,14;84:12; 86:7,17;87:20;91:24; 97:12;99:7;102:11; 103:7,14,19;105:5,7; 113:13;115:14,24; 116:4,10;118:3,11,15; 119:3,3;122:24; 123:19,23;124:4; 130:18 out-area (1) 121:18 outer-lying (1)</p>	<p>pace (1) 121:14 paid (2) 24:25;42:15 palatable (1) 99:25</p>	<p style="text-align: center;">P</p>

<p>peaks (1) 15:18</p> <p>pegged (1) 72:25</p> <p>people (33) 3:5;18:11;22:5; 24:17;26:13,14,17; 27:11;29:18,23;30:20; 37:19;38:5,9,13;43:20; 44:22;45:14,20;47:24; 50:23;69:14,24;71:7; 11;77:3;78:3;93:24; 94:3,9;108:11;131:18; 134:4</p> <p>people's (1) 17:1</p> <p>per (33) 16:1,5;18:13;20:10; 21:22;22:13;24:8,9; 25:18,18,19;26:22; 27:2,3;30:25;53:10; 57:11;58:12,15;59:8; 60:11;68:16;85:21; 88:9,16,16,24;89:10; 90:14;102:19,21; 103:24;113:12</p> <p>perceived (1) 19:19</p> <p>percent (78) 7:12,21;11:7;12:21, 22;13:7;15:7,14,15; 16:10;17:25;18:14; 21:15,17,19,21;22:1,3; 24:5;25:4,12;26:10; 28:12,14;29:5;35:7; 36:2,3,6,10,14,19; 39:14,18,19;40:11,13, 19,20,22;41:2;50:10, 12,15,17,24;51:3,13, 14;56:16;57:17,19,21; 58:8,10;60:2,6,7,22; 61:4,5,15,18;62:22; 79:6,7;81:11;86:10,12; 88:4,7;89:23;91:9; 116:15;126:1,1,2; 132:19</p> <p>percentage (6) 19:17,21,21;35:22; 42:15;113:1</p> <p>percentages (1) 17:22</p> <p>perception (1) 50:19</p> <p>perceptive (1) 27:18</p> <p>perceptual (1) 19:19</p> <p>perceptually (1) 49:24</p> <p>perhaps (10) 62:13,15;70:3,14; 84:1;111:9,18;114:9; 118:9;121:15</p>	<p>period (14) 8:10,15,20;11:20,20; 12:15;13:20;14:19; 15:14;16:9,11;36:11; 57:6;65:17</p> <p>periods (1) 21:1</p> <p>permit (4) 3:23,23;65:24;80:5</p> <p>permits (2) 4:5,5</p> <p>perpetuity (1) 101:18</p> <p>persistent (1) 83:23</p> <p>person (2) 87:10;92:20</p> <p>Personally (1) 62:25</p> <p>perspective (3) 72:6;83:5;93:6</p> <p>Phase (58) 5:6;8:17,19;9:1,5,14, 23;10:20;11:2,8,24; 12:3,18;13:21,25,25; 18:10,18;19:1;20:8,21, 24;21:1,3,6,11;22:15, 25;24:11;28:6,22;32:4, 10;33:21;52:12,12; 55:20;59:10;65:9;79:4; 96:11,14;102:1; 105:13;116:1,8; 119:11,16,17;120:4; 124:14;126:23;127:11, 13,14,20;128:13;134:7</p> <p>Phases (1) 12:25</p> <p>Philadelphia (1) 88:23</p> <p>Philip (1) 130:11</p> <p>Phillip (2) 29:16;30:16</p> <p>phonetic (1) 113:2</p> <p>physical (1) 97:19</p> <p>physically (3) 12:18;74:14;128:14</p> <p>pick (3) 32:1;83:9;129:5</p> <p>picture (5) 35:13;37:5;45:11,12; 81:20</p> <p>piece (2) 73:23;109:16</p> <p>pieces (5) 50:23;68:10;116:9; 125:23;128:12</p> <p>piecing (1) 128:14</p> <p>pin (1) 82:8</p>	<p>pipe (18) 53:5,7,9,12,19;54:5, 11;56:1;59:14,16; 66:20;68:12;74:13; 97:1,22,23;98:9;116:6</p> <p>pipes (8) 53:7;55:14;59:4; 60:13,14;62:15;97:4; 116:4</p> <p>pits (1) 99:18</p> <p>place (3) 80:15;132:12;133:2</p> <p>places (2) 80:25;89:15</p> <p>placing (1) 29:9</p> <p>plan (25) 6:10;7:11;8:6;10:5, 5;11:11;12:20;13:14; 20:4;43:11,13,14; 66:12;67:7;68:2;80:11, 12,21,22;81:10,13; 87:16;96:11;116:24; 122:24</p> <p>plane (1) 90:10</p> <p>planning (3) 11:20;13:10;127:11</p> <p>plans (3) 7:2;51:8;106:22</p> <p>plant (8) 56:21;99:9;101:12; 121:5,7;122:20; 123:14;127:16</p> <p>plant's (1) 122:22</p> <p>plausible (2) 121:22;122:19</p> <p>play (1) 11:25</p> <p>playing (1) 125:3</p> <p>plays (3) 13:18;61:2,23</p> <p>Please (4) 41:25;49:13;130:11, 13</p> <p>plugged (1) 9:3</p> <p>plume (4) 127:24;130:17,19; 131:2</p> <p>plus (3) 118:3;124:8;127:14</p> <p>PM (1) 135:19</p> <p>point (36) 3:19;4:24;12:1;26:9, 11;32:20;38:17;40:18; 47:17;51:23;53:12; 57:16;62:5;66:25;69:5, 12;70:1,13;74:18;</p>	<p>76:19;77:2;81:8;85:6; 86:16;91:16;94:18; 101:10;109:11;114:14; 116:20;121:4;122:14, 20;123:8,13;128:2</p> <p>pointed (2) 32:12;105:7</p> <p>points (1) 48:7</p> <p>policy (1) 72:5</p> <p>politically (1) 62:18</p> <p>poor (1) 126:7</p> <p>poorly (1) 116:7</p> <p>populated (1) 77:9</p> <p>population (5) 16:24;35:5,8;37:12; 46:15</p> <p>portion (5) 21:24;42:21;58:22; 59:1;74:21</p> <p>portions (1) 23:7</p> <p>position (2) 71:3;95:23</p> <p>positive (5) 45:25;85:11;87:3; 95:7;119:23</p> <p>positively (1) 84:21</p> <p>possibility (1) 85:19</p> <p>possible (7) 62:19;68:14;77:17; 93:24;109:18;110:14; 119:17</p> <p>possibly (1) 29:8</p> <p>post (3) 127:13,20;134:7</p> <p>postpone (1) 69:17</p> <p>potential (4) 6:19;64:6;72:18; 87:1</p> <p>Potentially (4) 22:19;49:4;68:3; 123:1</p> <p>power (1) 115:9</p> <p>practice (1) 54:6</p> <p>pragmatic (2) 86:23;93:14</p> <p>precise (3) 27:17;28:4;45:17</p> <p>precisely (2) 113:21;120:19</p> <p>predict (1)</p>	<p>94:19</p> <p>prediction (1) 134:3</p> <p>predictions (3) 94:13,16,24</p> <p>preferred (1) 118:16</p> <p>preliminary (2) 12:5;118:5</p> <p>premise (1) 16:17</p> <p>premium (1) 47:3</p> <p>prescribed (1) 27:12</p> <p>presence (1) 23:7</p> <p>present (4) 5:11,16;107:5;110:2</p> <p>presentation (7) 5:7;31:24;52:9;66:9; 70:2;90:1;125:11</p> <p>presented (3) 63:3;77:12;117:6</p> <p>presenters (1) 95:22</p> <p>Presently (1) 62:8</p> <p>presents (2) 10:14;109:15</p> <p>press (1) 130:8</p> <p>presume (1) 42:14</p> <p>pretty (4) 45:25;54:6;75:11; 134:25</p> <p>prevent (1) 109:7</p> <p>previous (3) 25:22;125:10;127:11</p> <p>previously (1) 4:15</p> <p>priced (1) 87:20</p> <p>prices (1) 107:7</p> <p>primarily (1) 4:3</p> <p>prior (1) 23:21</p> <p>prioritization (1) 125:9</p> <p>private (4) 82:20;100:18,19; 107:16</p> <p>privately (1) 106:19</p> <p>proactive (1) 67:16</p> <p>probably (11) 14:1;53:19;54:20; 78:9;81:2;83:3;89:11;</p>
--	---	--	--	--

<p>103:14;111:5;112:15; 115:25 problem (9) 76:4;130:14,20,23; 131:5,6,7,8,13 problematic (5) 102:12;105:14; 122:2;123:16,24 problems (5) 30:18;105:17,18,20; 116:19 proceed (1) 130:4 proceeds (1) 7:14 process (10) 5:10,18,22;6:22,24; 66:2;71:19,22;72:16; 127:9 program (26) 7:22;8:22;9:18;34:5; 53:19;56:6;73:22; 84:22;85:13;86:8,10, 14,14;91:19,22;92:11; 93:7,17,20;94:21;95:4, 6,10;126:11;135:8,12 programmatically (1) 117:10 programs (3) 88:22;89:13;125:24 project (16) 5:4;26:8;31:10;41:7, 14;45:2;54:10;65:9; 68:24;69:17;71:3; 82:24;90:25;113:24; 117:7,24 projected (3) 23:18;40:10;60:16 projections (3) 10:9;130:2,3 projects (20) 7:4;8:7,11;14:2,5,16; 32:9;42:3;48:15;52:3; 58:3;65:13;66:19;68:9, 20;75:9;107:16;113:8; 116:13;117:2 promise (1) 82:2 properties (3) 84:25;107:3;108:2 property (11) 19:7,9,10,10;28:8,16, 17;54:2;107:16,17; 110:4 proportional (1) 103:9 proposal (1) 91:10 proposals (2) 77:5;87:4 proposed (1) 9:18 protect (1)</p>	<p>78:1 protecting (2) 46:21;47:7 provide (3) 3:15;4:9;14:24 Providence (14) 34:13;36:17;38:24; 40:15,21;56:12;57:4, 20,24;76:10;110:16; 130:16;131:6,12 Providence's (1) 56:19 provides (2) 97:17,19 Providing (1) 4:6 public (6) 82:20;84:8;86:12; 88:3,14;100:25 public/private (2) 47:23;89:19 PUC (1) 14:21 pull (1) 111:2 pulled (1) 10:20 pulling (1) 42:6 pump (6) 99:4,7,9;100:2; 115:5;120:22 purely (1) 86:8 purple (2) 14:15;134:25 pursuant (1) 54:25 purview (1) 69:21 push (2) 50:14;123:23 pushed (3) 32:22;65:20;67:3 pushes (2) 111:10;112:23 put (29) 12:13;35:20;48:3; 57:15;58:5;59:13;60:4; 68:12;80:11;81:13,16; 85:15;87:7,8;95:4,22, 25;99:24;100:10; 101:23;102:14;109:5; 110:10;112:19;114:18; 117:7,21;120:7,9 putting (11) 12:15;59:2;61:3; 71:14;73:25;84:22; 94:21;97:1;123:9; 126:11;128:11</p>	<p>qualifications (1) 46:7 quality (22) 3:25;4:7;51:1;52:4; 55:15;77:15;78:10,19; 80:3;81:5,12;111:8; 117:3;119:24;123:1; 125:21;127:5,10,21; 128:4,15;135:7 quantify (1) 74:21 quick (7) 30:10;52:11;68:7,8; 100:14;130:10;133:23 quickly (2) 15:6;45:3 quite (5) 25:8;71:9;91:5; 108:16;120:19</p>	<p>44:14;45:6;50:6;57:5; 58:2;62:11,22,24; 63:24;70:7;107:2; 121:17;129:11;130:2, 2,3;132:20;133:8,13 rates (6) 14:19;21:18;25:4; 30:3;53:24;132:18 Rather (7) 74:6;76:5;101:8; 103:9;109:9;113:18; 122:17 rating (2) 19:5;28:7 ratio (1) 47:1 rattling (1) 95:19 Ray (1) 27:9 reach (1) 64:15 reached (2) 57:22;58:10 reaching (4) 60:6;76:22;77:5; 78:10 read (3) 10:2;41:23;89:8 reading (1) 25:22 ready (1) 2:13 real (12) 30:10,25;33:13,17; 35:14;42:8;62:9; 101:25;109:2;128:5; 130:10;133:23 realistically (3) 77:17;78:2;114:17 reality (1) 72:2 realize (1) 16:17 realized (1) 95:21 really (62) 6:23;8:21;11:11,13, 23;13:14;14:8;16:3,4, 22;19:20;29:14;32:19, 23;33:7,12,15,18,25; 35:8,9;36:5,18,23; 38:19;39:13;43:12,25; 46:19;47:13;49:22; 50:24;51:3,16;52:15, 21,22;55:21;57:18; 58:6;63:16;64:4;67:20; 75:15;76:18;77:3,9,11; 78:5,7;80:2;85:6; 86:13;96:6;105:2,4,16; 109:22;112:16;113:25; 114:5;121:13 reason (5)</p>	<p>76:18;82:6;85:3; 90:5;113:15 reasonable (5) 76:22;78:5,6;82:9; 100:7 reasonableness (1) 79:14 reasonably (4) 23:9;79:3;109:21; 116:18 re-base-lining (1) 12:24 recalibrated (2) 127:12;134:8 recall (1) 125:10 recalling (1) 85:20 receiving (1) 71:9 RECESS (1) 72:11 recognition (1) 81:10 recommend (1) 51:19 recommendations (1) 92:13 recommended (2) 66:12;124:6 recommending (1) 92:16 record (1) 133:20 records (1) 13:5 recoverable (1) 120:6 recreational (1) 102:10 red (12) 14:7,10;34:13;36:5; 57:9,10;58:18,22;59:1, 24;61:13;65:20 reduce (2) 74:9;125:25 reduced (2) 43:20;80:18 reduces (1) 84:8 reducing (1) 91:8 reduction (10) 86:6,11,13;88:5,7, 25;89:23;90:8,14; 126:2 redundancy (1) 97:18 reevaluate (1) 46:24 reevaluation (1) 5:6 reference (1)</p>
	Q			

<p>117:14 refine (1) 46:6 reform (3) 62:11,12,24 refresh (1) 117:13 refresher (2) 72:23;100:14 region (1) 110:2 regions (1) 116:25 regular (1) 10:22 regulations (1) 48:11 regulator (2) 73:8;74:16 rehabilitation (1) 59:3 REITSMA (23) 9:21,21;10:2,6,8,24; 28:3;36:21;46:3,3; 48:18;69:11;74:20,20; 75:4,8;92:1,18;93:23; 94:16,24;117:12,23 R-E-I-T-S-M-A (1) 9:22 related (4) 30:22;69:20;75:4; 120:16 relates (2) 29:3;133:1 relating (1) 10:13 relative (4) 30:25;90:20;121:13, 14 relatively (9) 27:17;44:21;86:22; 93:15;98:11;107:6; 109:13;120:17;122:4 reliability (7) 115:20;116:7; 118:10,24;120:15,16; 124:8 relief (1) 70:6 relieved (1) 73:11 relinquish (1) 109:2 relocate (1) 97:6 relocations (1) 99:18 remain (2) 40:4,25 remainder (2) 31:24;97:14 remains (2) 41:1,2</p>	<p>remember (12) 6:16;52:10;61:6,6; 65:11;82:3,19;83:18; 87:18,19;95:25;127:8 remind (2) 3:5;135:16 reminded (1) 2:21 remotely (1) 112:8 removal (1) 90:19 renewal (1) 108:6 repair (3) 8:14;54:4;69:6 repairs (2) 56:13;57:14 replace (1) 53:13 replaced (1) 56:1 replacement (3) 53:10,19;56:7 replacing (1) 59:7 replication (1) 45:17 REPORTER (3) 3:7;133:24;134:20 represent (4) 19:18;24:18;83:20; 113:2 representation (4) 13:17;14:21;41:16; 112:17 representations (1) 111:17 represented (1) 15:5 representing (2) 16:10;58:18 represents (4) 11:6;16:5;36:10; 39:14 reputation (1) 131:18 required (6) 3:12,19,23;4:16,22; 78:25 requirement (2) 3:14;4:9 requirements (4) 4:14;11:24;77:14; 78:24 requires (1) 78:21 requiring (1) 79:16 reservations (1) 102:6 reserves (4) 7:5;8:3;14:20;43:16</p>	<p>reside (1) 100:1 resident (1) 27:20 residential (14) 18:10;20:8;21:24; 22:2,2;24:6;25:3; 42:16,23;84:25;101:8; 108:14;132:15,19 residents (1) 49:24 residual (1) 4:4 resilience (5) 92:20,21,21;93:11, 25 resiliency (2) 96:13;105:25 resilient (2) 47:9;93:2 resource (1) 71:8 resources (1) 130:8 responsibility (2) 59:21;71:7 responsible (1) 131:1 rest (1) 122:10 restaurants (2) 131:16,19 restoration (4) 97:24;99:10,20; 107:12 restore (4) 51:1;76:24;77:1; 97:7 restored (1) 101:22 restrooms (1) 2:3 result (2) 21:10;28:21 results (2) 44:8;135:5 resurrected (1) 127:10 retail (1) 7:2 return (1) 93:16 reuse (4) 83:23;89:2,7;120:11 revenue (4) 21:15,20;23:23;30:4 revenues (3) 7:2,13;16:7 review (3) 5:9;12:15;126:12 reviewed (2) 43:14,15 reviews (1)</p>	<p>12:4 revised (3) 126:18,21,21 revolving (4) 13:15;15:2;67:5; 71:14 Rhode (9) 7:16;21:15;29:16; 67:2;94:17,25;130:12; 131:19;132:4 RHODES (2) 13:9,9 Rich (10) 5:2,3;9:2;32:1; 54:15;66:1;83:14; 88:11;90:7;129:1 right (47) 2:4,9,15,19;4:22; 22:13;26:1,5,7;31:22; 33:8;38:17;39:6,12; 40:2;46:23;48:5,14; 50:8;57:16;58:23;64:2; 68:19;75:17;76:18,23, 25;77:2,4;78:4;80:22; 81:15,19;82:17;83:9; 87:16;89:12,22;91:3; 92:22;103:13;110:18; 114:15;127:22;129:12; 130:9,21 right-hand (2) 88:15;90:12 rise (4) 10:13;94:2,3,6 risk (1) 92:19 risks (3) 56:8;119:11,16 River (24) 76:10,11;78:4;97:16, 23;98:21;106:8,11,13, 16;108:17,18,22; 110:11;115:13,15,23; 118:14;126:19;130:18, 19;131:3,7,12 riverbank (1) 97:24 rivers (1) 92:23 road (1) 44:5 roads (1) 97:7 roadway (1) 117:20 robust (1) 64:5 robustness (1) 118:25 rock (4) 74:6;98:25;99:3; 112:10 rolled (1) 34:6</p>	<p>rolls (1) 8:19 room (8) 2:5,5;50:5;63:11; 83:7;84:18;108:22; 129:9 roots (1) 84:24 rosier (1) 45:22 round (3) 55:20;79:21;84:10 route (2) 102:17;104:20 rubric (1) 19:16 run (7) 43:7;64:5;66:21; 68:15;99:8;127:18; 128:1 rundown (1) 108:3 running (1) 81:21 runoff (3) 131:4;133:11,11 runoffs (1) 133:5</p>
S				
			<p>safety (1) 100:25 sake (1) 2:17 salary (2) 19:17;50:12 same (22) 19:21;33:4;38:5,8; 41:19,20;42:15;46:6; 48:21;51:20;59:2; 60:12;74:5;90:10;91:9; 101:24;108:6;118:19; 122:10,13;123:21; 134:14 sanitary (3) 59:14,16,17 sat (1) 65:23 satellite (3) 3:13,20;4:20 Save (3) 79:22;93:1;129:4 saving (1) 30:4 savings (2) 92:5;98:19 saw (3) 42:6;65:12;133:9 saying (24) 6:21;20:18;25:9; 27:8;30:23;31:10; 32:23;33:5;36:6;42:2;</p>	

49:23;56:25;63:18; 67:8;77:10;85:25;89:4; 91:2;94:9,20;95:3; 114:15;117:18;120:21	selected (1) 38:23	seven (3) 15:17;70:19;82:13	show (6) 36:24;37:23;108:25; 111:19,20;135:7	60:25;74:9,14;100:7
scale (3) 89:5;113:16;126:3	sell (1) 120:11	several (1) 99:2	showed (3) 65:19;104:2;111:18	skeptical (1) 109:21
scaling (1) 87:23	semi-centralized (1) 100:4	severe (1) 107:17	showing (3) 37:5,7;76:9	skew (2) 33:11;63:8
scan (2) 82:9;90:11	send (2) 27:20;72:4	sewer (48) 8:13;9:6;12:9;34:7; 53:6,25;54:2;55:1; 66:19;67:12;72:25; 73:15,24;74:2,8;96:23; 97:2,10,11,14,15;98:3, 5,14,23;99:10;100:5; 113:7,12,13,18;115:12, 18,24;116:2,4,8;117:7, 19;118:9;125:19,24; 126:5,18,20;127:15; 128:3;133:1	shown (2) 42:5;135:6	skewed (1) 55:22
scenario (8) 40:24;41:5;45:21,22; 48:8;64:7;65:15,23	sense (7) 15:6;54:24;71:5; 76:13;98:8;104:11; 116:24	sewerage (2) 25:18;131:2	shows (1) 83:16	skewing (1) 37:14
scenarios (6) 51:7;56:3;64:6; 114:2;128:1,22	senses (1) 82:23	sewers (1) 99:20	sic (3) 99:19;114:6;125:5	slide (9) 15:16;42:5;62:3; 86:5;87:14;91:8;95:14; 130:11,13
schedule (4) 12:4,11;66:15;68:7	sensitivity (1) 128:9	shafts (6) 12:9;73:5;99:4,11; 102:18;114:10	side (11) 16:7;55:3;106:8,11; 108:17,18,22;110:11; 130:18,21;132:9	slides (7) 38:19;49:9;82:2; 95:24;96:3;110:20; 111:16
school (1) 100:16	sentiment (1) 71:2	shallow (1) 122:4	sidewalks (1) 97:9	slight (2) 9:10;91:7
score (6) 18:23;28:15,17,20; 110:5;116:7	separate (7) 53:24,24;59:15;64:1; 97:2;130:19,19	shape (1) 135:8	sifting (1) 118:17	slightly (4) 82:5;89:16;98:20; 102:23
scores (3) 115:14;118:11; 123:19	separating (1) 98:10	share (4) 22:2;24:6;56:19; 73:1	sight (1) 132:11	slopes (2) 98:12;126:8
Screening (12) 3:17,22;4:6;72:17; 110:21;111:3;119:22; 120:8;122:18;124:21, 24;125:1	separation (31) 9:6;12:9;58:22; 72:25;73:16,24;74:2; 96:23;97:10,11,14,16; 98:4,5,15,23;113:8,12, 13,18;115:12,18,24; 116:2,4,9;117:19; 118:9;126:18,20;128:3	shafts (6) 12:9;73:5;99:4,11; 102:18;114:10	sign (2) 2:21;80:17	slow (2) 68:9,10
sea (4) 10:13;94:2,3,6	September (1) 6:5	sheds (6) 74:8;100:5;125:19, 24;126:5;127:15	signed (1) 133:18	slowly (1) 3:6
second (10) 69:9;71:21;72:12; 75:6,7,20;94:5;95:13; 97:4;129:18	separations (1) 117:8	shared (1) 103:16	significant (6) 29:5;42:19,21;46:14; 119:15;124:13	small (8) 38:6;55:18;60:9; 85:9;93:15;122:4; 128:4,6
secondary (5) 3:12,19;4:10,21; 122:16	septage (1) 7:13	shells (1) 103:16	significantly (2) 46:15;104:15	smaller (5) 38:12;60:25;68:11; 70:3;85:7
Secondly (1) 2:7	septic (1) 131:3	sheds (6) 74:8;100:5;125:19, 24;126:5;127:15	sign-in (2) 133:19;135:15	smart (2) 29:24;30:5
seeing (1) 54:7	sequence (1) 117:2	sheet (3) 2:22;133:19;135:15	sign-up (1) 2:22	smartness (1) 30:2
Seekonk (8) 76:1,11,16,25;78:3; 101:3;104:20;128:8	sequencing (1) 117:7	Shell (2) 29:17;131:10	similar (3) 20:3;122:14;124:20	smooth (1) 14:18
seem (3) 29:5;32:23;37:14	series (2) 58:2;86:19	shellfishing (2) 78:14;130:24	simple (1) 44:22	smoothing (1) 15:21
seems (17) 6:5;16:4;19:16; 22:24;32:24;46:8;62:9; 71:20;76:20,24;78:4; 91:23,24;107:22; 108:6;110:23;116:17	serious (2) 47:7;74:12	Sherlock (1) 73:14	simply (3) 72:19;92:3;126:10	snapshot (4) 11:23;20:9;26:6; 41:17
sees (1) 32:18	served (9) 22:5,8,10;24:15,17; 26:17;38:13,14;92:17	shift (3) 42:18,22;44:14	site (26) 56:9;68:13;74:12,15; 100:18,20;101:6,7,12; 102:25,25;103:5,5; 105:14;106:10;109:25; 112:6;120:6,8;122:2; 123:16,24,25;124:23, 24,25	society (1) 78:5
segment (1) 67:13	service (30) 4:12;7:5;11:12; 13:11;14:7;20:17; 22:18,21,23,25;23:2,4, 4,10;34:17;36:23,25; 39:15;40:9,12,14,18; 59:16,23;62:13;82:13, 15;86:21;95:1;102:11	shifting (1) 16:22	situation (1) 66:21	soft (1) 47:3
segmented (1) 71:3	services (1) 24:25	shoot (1) 48:4	sitting (2) 44:4;110:25	softer (1) 47:2
select (1) 74:8	set (4) 44:24;86:7;87:12; 97:4	short (2) 75:2;93:4	six (1) 18:20	soil (2) 101:10;103:3
		shortening (1) 70:16	size (7) 7:25;38:3;43:20;	soils (4) 98:12;119:12,13; 126:8
		shortfalls (1) 63:7		solution (17) 4:7,20;6:4;48:23; 74:23;86:7,23;103:13, 16;111:9;112:20; 118:12,21;120:2,10; 129:7;130:15
		short-term (2) 79:13;86:22		
		shovels (2) 68:18;72:1		

<p>solutions (5) 92:15;109:14; 111:11,23;133:14</p> <p>solve (3) 73:17;76:3;105:19</p> <p>somebody (2) 61:7;96:1</p> <p>somebody's (1) 107:19</p> <p>somehow (2) 69:16;109:6</p> <p>someone (4) 37:9;75:14;133:23; 134:1</p> <p>sometimes (3) 30:8;41:12;125:11</p> <p>somewhat (7) 28:13;38:3;44:19; 83:25;85:3;101:7; 135:1</p> <p>somewhere (1) 29:6</p> <p>Sooner (1) 47:5</p> <p>sophisticated (1) 123:3</p> <p>Sorry (12) 9:19;10:2;19:14; 25:15;37:23;48:19; 66:6;70:20;85:16; 111:16;133:22,25</p> <p>sort (22) 26:18;30:17;46:7; 50:2;63:13;66:23,24; 75:6,23;82:23;83:4,5; 88:21;100:22;104:12, 14;107:11;112:12; 113:17;117:10;127:18; 128:21</p> <p>source (1) 24:20</p> <p>sources (1) 7:2</p> <p>south (1) 101:11</p> <p>space (4) 68:25;102:9;106:12; 109:16</p> <p>speak (5) 2:16;3:5,6;74:25; 96:17</p> <p>SPEAKER (5) 2:14;10:3;75:19; 110:25;134:18</p> <p>specific (3) 39:5;56:9;64:10</p> <p>specifics (1) 19:3</p> <p>speed (1) 120:23</p> <p>spend (3) 60:11;71:24;80:7</p> <p>spending (3)</p>	<p>56:12;60:9;109:20</p> <p>spent (2) 58:12;72:4</p> <p>spikes (1) 13:19</p> <p>spoil (1) 85:22</p> <p>spoiler (1) 29:13</p> <p>spoke (4) 62:6;70:21;97:12; 101:4</p> <p>spot (1) 53:11</p> <p>spread (5) 52:16;65:12,12;69:3, 3</p> <p>squeezing (1) 84:16</p> <p>SRF (1) 64:13</p> <p>SSO (1) 105:20</p> <p>staff (1) 44:4</p> <p>stage (4) 82:7;91:14;92:2,9</p> <p>staggering (1) 130:3</p> <p>stakeholder (3) 5:22;6:16;95:21</p> <p>stakeholders (2) 9:15;50:5</p> <p>stakeholders' (1) 71:18</p> <p>stance (1) 89:16</p> <p>stand (2) 79:4;83:18</p> <p>standard (3) 8:4;55:16;78:13</p> <p>standardized (1) 109:13</p> <p>standards (10) 3:25;4:8;33:23; 77:15;78:20,25;79:9; 80:4,18;81:12</p> <p>standing (1) 68:18</p> <p>standpoint (2) 44:7;76:3</p> <p>stars (1) 15:17</p> <p>start (29) 3:3;5:9;7:8;12:6; 16:21,22;17:9;32:12, 20;35:12,14,19;44:16; 47:19,24;48:17;51:7; 58:4;67:9,19;72:12; 95:19;114:13;118:17; 119:13;125:23,24; 131:25;134:17</p> <p>started (6)</p>	<p>3:2;6:7,18,20;80:10; 132:23</p> <p>starting (7) 5:15;6:25;16:3; 32:19;50:23;51:23; 57:4</p> <p>starts (6) 11:11;33:25;36:12; 53:13;63:7;67:8</p> <p>state (20) 2:18;3:5;5:10;13:15; 15:1;21:13,20;23:23; 64:13,18,19;67:5;68:3; 70:14,18;71:6,13; 76:10;95:1;129:16</p> <p>stated (2) 4:15;13:3</p> <p>states (1) 129:22</p> <p>state's (1) 71:15</p> <p>Statewide (6) 13:9;130:14,24; 131:8,14,25</p> <p>station (4) 99:5,9;100:2;115:6</p> <p>stay (2) 50:23;62:21</p> <p>steared (1) 113:17</p> <p>steep (2) 98:12;126:8</p> <p>steer (2) 80:9;122:3</p> <p>stenographer (1) 2:12</p> <p>step (3) 39:10;52:21;132:5</p> <p>steps (2) 5:19;134:16</p> <p>still (21) 3:17;36:9;41:21; 44:2;47:7;49:5;51:4; 52:5;59:16,20;60:17; 61:13;76:21;77:24; 79:20;81:9;115:7; 118:11;123:19;125:5; 131:8</p> <p>stop (2) 71:23;133:16</p> <p>storage (13) 4:12;74:5;86:20; 97:20;98:24;102:22; 106:4,17;113:18; 118:18,22;124:17; 125:4</p> <p>store (1) 45:9</p> <p>storing (3) 74:6,7;99:6</p> <p>storm (34) 4:15,18;10:14;20:15; 31:17;34:7;39:3;54:9;</p>	<p>55:5,7;57:7,12;58:16; 59:13;60:14;66:20; 74:22;75:11;77:21; 79:6;83:19;88:18; 89:24;99:8;104:4; 127:23,23;131:4; 133:3,7;134:3,14,15,17</p> <p>storms (3) 4:18;94:7;134:13</p> <p>story (5) 32:24;98:17;122:14, 15;123:21</p> <p>straight (2) 9:20;126:19</p> <p>straightforward (1) 98:14</p> <p>strategic (1) 70:1</p> <p>strategy (1) 69:23</p> <p>streaming (1) 113:24</p> <p>street (14) 54:5;67:13;100:8,15, 17,19,20;104:17;112:5, 18;118:14;119:9,9; 123:21</p> <p>streets (2) 53:15;69:6</p> <p>strength (1) 29:2</p> <p>stretched (1) 65:17</p> <p>strictly (2) 11:2;48:10</p> <p>stripped (1) 13:23</p> <p>strong (4) 18:23;19:6;28:8,10</p> <p>structure (1) 47:4</p> <p>structures (1) 133:14</p> <p>struggle (1) 81:6</p> <p>stub (6) 76:5;105:9,21;118:7; 124:4;127:3</p> <p>studies (4) 38:24;54:15;56:11; 64:3</p> <p>Studios (1) 44:16</p> <p>study (5) 60:7;61:3;122:23; 127:2,3</p> <p>stuff (5) 40:3;45:13;121:25; 126:13,15</p> <p>stunned (1) 75:10</p> <p>subarea (2) 103:19,20</p>	<p>subgrouping (1) 114:16</p> <p>subgroups (2) 112:24;113:22</p> <p>subject (3) 32:4;72:8;81:18</p> <p>submit (1) 67:7</p> <p>subsets (1) 114:1</p> <p>subsidiies (1) 61:17</p> <p>substantial (1) 120:4</p> <p>subsystem (3) 96:9,9;116:22</p> <p>subsystem-by-subsystem (1) 103:18</p> <p>subsystems (4) 102:16;111:22; 116:14;128:13</p> <p>sub-systems (1) 6:5</p> <p>subterranean (1) 106:25</p> <p>subtracted (1) 97:12</p> <p>sub-tunnel (1) 75:20</p> <p>sub-watersheds (1) 83:14</p> <p>successful (1) 108:16</p> <p>sudden (2) 43:1;133:12</p> <p>sufficient (1) 73:17</p> <p>suggest (2) 47:16;71:12</p> <p>suggested (2) 44:23;75:5</p> <p>suggests (1) 31:16</p> <p>summary (1) 85:25</p> <p>supported (1) 33:24</p> <p>supposed (2) 99:12;126:13</p> <p>sure (10) 2:18;5:12;31:2,2,20; 37:11;42:1;65:1;66:3; 120:19</p> <p>surface (13) 54:24;74:7;97:7; 99:1,20,22;101:17,21; 102:22;107:12,22; 118:18;121:22</p> <p>surfaces (1) 109:19</p> <p>surge (1) 10:14</p> <p>surprise (1)</p>
--	--	---	--	---

86:15 suspected (1) 119:12 swimmable (1) 77:7 swimming (3) 77:3;78:7,15 system (29) 20:14;39:3,3;47:9; 53:4,6,24;54:1;56:22; 59:20;60:19;63:21; 73:10;79:6;90:16;97:2; 105:17,23,24;112:17; 115:11;116:3,6; 118:24;121:2,10; 124:8;125:17;131:12 systems (5) 66:20;106:1;120:7; 131:2,4	100:8,17,19,24;101:1, 3,5,10,13,16,24;105:3, 9,15;106:4;107:11; 110:2;112:5,7,18,18; 118:14;121:22;122:1, 4,5,9,12,13,14;123:16, 21;124:10,12;127:4 tanking (1) 107:17 tanks (14) 92:22;99:22;100:14; 101:21;102:24;105:1, 5;115:3;118:7;119:3,9; 120:18;121:18;122:10 tapers (1) 14:11 target (1) 81:18 targets (1) 7:5 task (1) 44:21 tasked (1) 51:4 tax (8) 19:9,10;28:16,18; 62:10,12,21;70:17 taxable (1) 63:14 taxes (3) 54:1,2;62:9 taxpayers (1) 50:7 team (2) 5:5;110:17 tearing (1) 53:14 technical (8) 32:3,9;44:7;66:18; 70:22;72:17;83:5;91:7 technically (1) 73:13 technique (1) 83:11 tempered (1) 84:1 ten (3) 41:3;68:6;72:9 tenant (2) 29:20,21 ten-off (1) 133:12 ten-year (1) 65:16 term (4) 49:20;93:3,8;124:23 terminology (1) 16:24 terms (35) 19:12;20:2,12;21:8, 18;25:9;28:7;32:3; 39:21;41:5;46:10,20; 55:14;59:3;66:18,23;	74:4;82:24;84:3,16,21; 86:6;88:14;90:13; 91:21;92:3,3,5,14; 95:3;102:13;117:6; 120:5;126:11;129:10 terribly (3) 106:20;126:6,21 test (1) 128:23 testing (1) 128:22 theoretically (1) 25:23 thinking (4) 17:9;47:19;117:10; 130:6 third (2) 9:14;105:8 thoroughly (1) 7:1 though (11) 22:24;37:14,15;38:1; 65:2;77:16;106:7; 107:4,5;108:25;123:17 thought (4) 8:25;70:12;95:18; 109:12 thoughts (1) 75:16 three (17) 13:24;29:20;38:6,24; 40:14;44:9;54:15; 56:10;67:14;75:2;82:1; 99:17;102:1,11; 110:23;129:2;131:2 three-family (2) 27:1,21 three-month (5) 83:19;88:18;89:24; 104:4;134:15 threshold (2) 57:21;61:15 thriving (1) 108:2 throw (2) 46:9;67:25 thrown (1) 105:2 Tidewater (2) 101:3;122:13 tie (1) 102:16 tight (2) 98:11;126:8 Tim (1) 101:4 times (5) 6:23;67:14,15;77:15; 80:25 timing (1) 48:14 tiny (1) 85:19	tipped (1) 104:14 today (15) 2:12,24;5:7;6:9; 20:10,11;22:12;26:1; 35:20;43:6;64:4;66:13; 79:4;132:18;133:9 today's (9) 8:20;20:5,7,23;21:2; 22:11;24:20;39:25; 81:18 together (13) 80:11;84:22;89:7; 94:21;95:4;98:14; 111:2;112:16,19,19; 126:11;128:11,15 Tom (9) 2:21;3:2,8;9:16; 59:12;66:5,9;72:7; 135:13 tomorrow (1) 42:9 Tom's (1) 120:14 took (2) 89:18;97:11 top (7) 14:15;15:3;25:22; 37:8;58:19;103:8; 133:9 Topher (3) 129:4;131:14,24 topic (2) 32:5;109:4 toss (1) 31:24 total (15) 8:9;21:24;22:1,3; 23:5,22,25;24:3;25:18; 39:14;42:15;53:5; 59:23;116:14,15 totals (1) 8:23 touch (1) 81:25 touched (1) 128:21 toward (1) 106:16 towards (3) 64:19;113:17;122:3 town (3) 37:17;62:20;70:10 towns (4) 23:7,8;38:8;55:13 track (4) 17:14;34:24;35:4,7 tracking (1) 28:1 tracks (12) 27:23;34:16;35:5; 38:3,4,7;52:14;57:3; 58:1,9;60:3;61:25	tract (6) 37:4,5,7,10,16;57:23 traffic (1) 67:15 trafficked (1) 104:21 transfer (1) 63:22 transfixed (1) 90:20 transportation (1) 109:6 treadmill (1) 15:20 treasurer (1) 129:15 treat (3) 79:7;121:15,20 treated (2) 55:8;104:6 treatment (27) 3:12,13,19,20;4:10, 13,20,21;8:8;13:25; 21:4;38:20;46:21;47:8; 54:25;56:21;59:19; 99:8;101:11;115:7; 121:5,7;122:20,21; 123:2,13;127:6 trees (2) 107:4;117:21 trench (1) 99:19 Trial (2) 2:14,15 tried (2) 43:6;65:24 tries (1) 34:11 trivial (1) 117:5 true (3) 34:9;35:12;41:21 truth (1) 95:9 try (13) 41:7,15;48:13;53:1, 10;58:14;64:3;69:16; 71:9;76:24;80:9;96:3; 110:25 trying (29) 2:16;11:23;25:16; 26:21;35:19;41:13,16; 43:7,17,23,25;44:2; 46:16,17,19,23,24; 56:11;70:24;76:16; 78:1,2;79:23;80:10; 81:12;95:4,11;110:19; 131:23 T-shirt (1) 87:12 tunnel (65) 4:12;9:6;12:13; 31:13;72:2;73:2,3,4,7,
T				
tab (1) 23:21 table (8) 2:25;56:24;85:15; 103:7,12;111:11; 129:24;130:8 tabled (1) 9:13 tables (1) 111:20 tags (1) 2:23 tail (2) 30:7;117:8 talk (13) 31:23;33:7;38:21; 54:18;66:1;69:13; 88:24;91:20;93:24; 94:3;99:1;107:14; 132:9 talked (12) 23:20;55:6;56:18; 82:3,20;83:14;90:14, 23;91:15;96:24;116:2; 123:3 talking (37) 6:18;8:21;16:21; 17:10;20:4,25;21:2,9; 32:8;33:13,17;35:12; 37:17;38:18;39:6; 40:18;47:25;52:16; 61:14;66:18;69:15; 72:22;75:24;83:19; 84:17;88:12;92:21; 93:20;94:2,6;96:25,25; 99:22;100:14;114:11; 130:15,16 talks (1) 90:8 tank (39) 74:7,10,15;99:1;				

<p>11;74:4,6;76:5;86:19; 98:4,25;99:2,3,13; 102:16,17,20,23;103:9, 10,13,15,19;104:11; 105:1,5,9,21;106:2; 112:11,14,20,23,24; 113:2,9,10,24;114:4,8, 14,17;115:2;117:9; 118:16,18,21;119:1,8; 120:9,19;121:2,3,6,21; 122:3,12;124:4; 126:22;127:3</p> <p>tunnels (1) 12:8</p> <p>turn (5) 18:2;45:10,11;58:15; 61:13</p> <p>turning (1) 67:19</p> <p>twice (1) 109:20</p> <p>Two (33) 3:4;16:10;18:8,15, 16,23;25:11;41:12; 48:6;64:23;67:14; 72:10;88:14;89:10; 91:17;98:13,19;102:1, 11,14;105:15;106:1; 112:15,19;116:13,13, 14;117:14;121:22; 126:24;129:1;134:12, 15</p> <p>two-part (1) 5:7</p> <p>tying (1) 36:5</p> <p>type (1) 33:5</p> <p>types (5) 16:18;29:14;33:4; 43:8;48:12</p> <p>typical (2) 34:19;82:18</p>	<p>99:6</p> <p>unemployment (4) 19:7,8;28:10;41:2</p> <p>unenviable (1) 95:22</p> <p>unfavorable (1) 119:8</p> <p>UNIDENTIFIED (5) 2:14;10:3;75:19; 110:25;134:18</p> <p>unique (1) 52:19</p> <p>unit (2) 27:2;28:1</p> <p>units (2) 22:4;27:23</p> <p>University (1) 87:11</p> <p>unless (5) 4:7;30:4;54:17; 77:18;96:6</p> <p>unlike (1) 86:19</p> <p>unmeetable (1) 79:5</p> <p>unpractical (1) 107:8</p> <p>unrelated (1) 30:19</p> <p>up (55) 2:16;10:22;13:18,19; 17:21;19:24;25:4;29:1; 30:1,2,4;32:2;33:4; 36:18;37:5,7;38:2; 39:16;42:13;44:25; 46:24;47:20;49:18; 52:8;53:14;54:18;62:4; 63:9;65:19;66:12,23; 67:6;69:9;70:12;74:22; 76:10;80:20;87:22; 89:10;95:23;96:19; 99:3;100:18;102:14; 104:12;107:19;115:7; 116:15;122:11;124:1; 125:10;129:6;131:18; 132:19;135:5</p> <p>UPA (1) 65:14</p> <p>updated (1) 127:12</p> <p>upfront (2) 2:19;111:20</p> <p>upgrade (1) 127:16</p> <p>upon (1) 116:21</p> <p>upper (3) 76:17;77:1;78:8</p> <p>upstream (1) 125:12</p> <p>urban (1) 108:5</p> <p>urbanized (1)</p>	<p>84:15</p> <p>usage (2) 26:23;29:20</p> <p>use (33) 6:3;17:7;21:25; 26:13;29:19,22,24; 44:17;59:13,14;65:6; 71:8,16;76:19,24;77:1; 79:11,18,21;80:16; 81:4,8,15;100:24; 101:21;102:4,7;104:8, 10;106:17,22;107:6; 124:25</p> <p>used (9) 22:1;30:16;47:14; 64:21;76:19;83:21; 89:3;127:11;135:12</p> <p>useful (2) 45:19;65:4</p> <p>users (1) 22:2</p> <p>uses (15) 7:3;8:13;30:2;78:1, 6;79:23,24;80:2,23,24; 101:2,16;106:20,21; 119:18</p> <p>using (15) 7:15;13:14;23:23,23, 24;28:1;29:23;30:20; 43:21;56:15;74:8;90:6; 100:20;128:8;134:8</p> <p>usual (1) 5:8</p> <p>usually (1) 32:22</p> <p>utility (5) 18:22;33:14;46:8; 99:18;133:7</p> <p>utilize (1) 100:8</p>	<p>Vegas (1) 91:16</p> <p>vent (1) 133:15</p> <p>versa (1) 109:9</p> <p>version (2) 23:15;31:8</p> <p>versus (9) 9:9;105:3;118:18,21; 121:7;122:6,12;127:3; 132:18</p> <p>vertical (2) 111:25;112:2</p> <p>vets (1) 125:4</p> <p>vice (1) 109:9</p> <p>vicinity (1) 108:17</p> <p>view (3) 82:10;114:1;116:18</p> <p>viewed (1) 30:12</p> <p>viewing (1) 71:3</p> <p>views (1) 88:13</p> <p>virtually (2) 30:19;81:10</p> <p>volume (10) 26:15;74:14;88:5; 98:24;99:6;100:7,9; 102:20;103:20;104:6</p> <p>volumes (3) 74:5;83:25;104:3</p> <p>volumetric (1) 16:6</p> <p>vulnerability (1) 10:12</p> <p>vulnerable (1) 79:21</p>	<p>wasted (1) 123:9</p> <p>water (72) 3:25;4:7,8,14;7:16; 8:8;13:24;20:15;21:4, 16;29:22,23,24;30:2,4, 21,24;31:17;43:21; 44:17;46:21;47:8; 50:22;51:1;52:4;54:25; 55:3,5,7,15;57:8,12; 58:16;59:8;60:11,15; 63:4;66:20;71:5,9; 74:22;75:12;76:15; 77:14,15;78:10,14,19, 21;80:3;81:5,12;97:5; 111:7,8;117:3;118:7; 119:24,25;123:1; 125:21;127:5,10,21; 128:4,7,15;129:12; 131:4;133:3,7;135:7</p> <p>waters (1) 77:6</p> <p>watershed (1) 84:16</p> <p>watersheds (1) 85:10</p> <p>way (21) 23:5;25:6;31:7,18; 44:25;45:7,10,11; 46:11,25;47:10,12; 62:1,8;74:21;82:5; 91:15;97:6;99:6;102:9; 103:7</p> <p>ways (6) 47:15,15,20;70:6; 125:15;129:23</p> <p>weak (4) 18:22;19:6,19;28:13</p> <p>weakness (1) 29:2</p> <p>wear (1) 15:21</p> <p>weather (9) 76:12,13;78:2,3,8; 85:4;94:25;121:16; 122:22</p> <p>Webbing (3) 100:17;112:18; 123:16</p> <p>weeks (2) 75:2;128:23</p> <p>weigh (1) 18:21</p> <p>weighing (1) 61:23</p> <p>weight (2) 34:24;37:15</p> <p>weighted (4) 17:21;24:12,16,19</p> <p>weighting (3) 37:16,18;124:6</p> <p>weights (2) 36:4;96:22</p>
<p style="text-align: center;">U</p>		<p>V</p>	<p>W</p>	
<p>ultimately (1) 110:13</p> <p>unaffordability (2) 39:18;40:17</p> <p>unaffordable (7) 25:10;36:7,20;40:10, 21;49:20;51:25</p> <p>under (12) 8:9;11:24;39:17; 62:21;65:15;78:23; 84:16;86:2;89:11; 108:19;126:24;134:3</p> <p>underestimated (1) 84:11</p> <p>underlying (2) 31:12,17</p> <p>underneath (1)</p>	<p>UPA (1) 65:14</p> <p>updated (1) 127:12</p> <p>upfront (2) 2:19;111:20</p> <p>upgrade (1) 127:16</p> <p>upon (1) 116:21</p> <p>upper (3) 76:17;77:1;78:8</p> <p>upstream (1) 125:12</p> <p>urban (1) 108:5</p> <p>urbanized (1)</p>	<p>vacant (2) 107:3;108:1</p> <p>Valley (1) 127:16</p> <p>value (6) 19:7,10;28:9,16,17; 50:22</p> <p>variability (3) 98:7;102:25;103:5</p> <p>variable (2) 84:3;90:17</p> <p>variance (1) 34:17</p> <p>varies (1) 78:13</p> <p>various (5) 7:23;14:22;49:4; 69:23;95:9</p> <p>vast (1) 30:21</p>	<p>Wait (2) 32:23;33:5</p> <p>waiting (2) 3:1;67:12</p> <p>walk (1) 18:6</p> <p>WALKER (2) 132:3,3</p> <p>wants (1) 15:24</p> <p>warning (1) 3:10</p> <p>Warwick (2) 130:25,25</p> <p>waste (8) 8:8;13:24;21:4; 46:21;47:8;57:11;59:8; 60:11</p>	

welcoming (1) 2:11	109:9;110:3	zone (1) 104:22	13th (2) 95:25;135:17	2021 (3) 13:20;57:22;60:24
weren't (1) 43:17	worked (2) 53:1;115:6	zoning (2) 76:21;108:25	14 (4) 28:14;29:5;78:15; 134:9	2022 (3) 13:20;60:2,21
West (8) 97:16,23;98:21; 115:12,15,23;126:19; 130:25	working (6) 5:24;8:25;33:8; 64:24;78:23;110:11	0	14,999 (1) 35:2	2023 (2) 40:8;57:18
western (2) 130:18,21	worksheets (2) 23:13,16	0 (1) 7:12	15,000 (2) 50:11;61:16	2026 (4) 8:10;11:16;40:12; 58:7
wet (5) 76:12,13;78:3,8; 122:22	workshop (2) 72:8;81:17	035 (1) 98:8	150 (2) 16:5;61:9	205 (6) 84:6;100:5;112:3,4; 123:8;124:20
what's (21) 20:9;22:12;33:18; 35:12,19;39:12;47:22; 49:25;50:1;51:16;52:3; 58:6,19;62:1;63:15; 64:4;67:1;71:25;72:24; 82:10;111:25	worried (2) 48:2;94:9	039 (1) 97:16	153 (2) 21:4;24:2	206 (4) 85:7;98:17,18;118:1
wheelhouse (1) 120:14	worry (3) 93:25;115:4;132:15	056 (1) 97:16	16 (7) 17:15;35:2;61:7; 96:12,21;111:15; 115:13	20-year (4) 11:19,20;41:14; 51:17
Whereas (2) 43:3;50:13	worrying (1) 132:16	1	175 (1) 11:8	213 (1) 122:9
wheres (1) 90:15	worse (3) 45:21;55:24;56:2	1 (2) 18:14;36:2	195,000 (1) 58:15	218 (3) 101:11;122:18,19
white (1) 11:3	worst (8) 40:24;41:4;43:11,12, 18,24;44:1;134:25	1.2 (1) 57:12	1997 (5) 16:14,25;18:7;32:19; 34:19	22 (1) 21:17
whole (18) 17:7;26:16;33:15; 34:5;37:5;39:7;43:1; 61:18;70:13;81:20; 82:13,24;84:9;99:23; 103:16;106:13,15; 131:12	worth (1) 80:19	1.50 (1) 88:25	1997's (1) 132:6	220 (10) 75:22;105:16,21,23; 106:6;108:12,17; 123:25;124:4;128:5
who's (1) 124:9	wrap (1) 96:19	1.67 (2) 24:23;25:4	2	25 (4) 12:21;64:21;89:3,5
whys (1) 90:15	wrapped (1) 99:2	1.9 (1) 28:12	2 (19) 17:25;25:12;36:3,6, 14:50;10,15,24;51:3; 57:17,19,21;58:10; 60:2,7,22;61:5,15,18	25,000 (1) 61:16
wide (3) 22:22,23;90:13	wrapping (1) 95:23	10 (4) 50:11;61:16;86:12; 88:4	2.3 (1) 7:21	26 (2) 6:22;21:15
widens (1) 35:13	wrong (6) 29:10;32:13;83:7; 91:25;94:14,14	10,000 (2) 35:2,2	20 (6) 7:21;12:22;21:20,21; 56:16;111:24	27 (1) 85:8
wider (2) 93:18,22	Y	100 (4) 42:24;79:6,7;126:1	200 (3) 16:1;78:16;90:19	28 (1) 85:8
withdraw (1) 121:17	yards (3) 106:12,16;108:20	100,000 (1) 58:12	201 (2) 100:5;112:4	29 (1) 85:8
within (4) 24:17;34:16;37:19; 62:23	year (21) 14:2;17:6;20:20; 25:4,19;26:10;27:6; 51:18,18;53:10;57:11; 58:12,16;59:8;60:11; 61:16;62:12;64:22; 68:22;89:6;126:12	101 (1) 85:7	2010 (2) 13:3,4	3
without (5) 31:19;43:7;52:12,12; 53:14	years (23) 7:12,21;11:16,22; 13:24;21:20,21;35:24; 41:3;47:10;54:12; 55:18;56:16;57:22; 64:22;79:14;83:22; 89:3,5;93:21;102:2,11; 134:9	107 (1) 90:18	2012 (2) 24:21;34:6	3 (6) 13:7;20:19;21:19; 26:10;51:13;62:22
wondering (4) 8:25;36:24;49:8; 120:14	yesterday (1) 6:6	11.8 (1) 84:9	201-205 (1) 118:13	30 (3) 51:17;126:1,2
Worcester (2) 110:16;127:17	York (1) 88:23	118,000 (4) 24:7;36:15;39:12; 52:17	2013 (1) 101:1	300 (1) 88:4
words (3) 44:18;90:6;121:16	Yup (1) 28:5	118,638 (1) 22:5	2014 (4) 13:5;17:19;20:12; 24:21	32 (1) 91:18
work (9) 10:17;28:25;37:13; 45:16;59:2,10,25;	Z	12 (4) 11:16,22;35:24; 93:21	2015 (4) 8:10;36:12,20;57:4	33,880 (1) 58:7
	zero (1) 60:9	12.4 (1) 15:15	2018 (4) 9:9;13:2,8;42:5	35 (4) 16:8;98:19,20;116:3
		12.8 (1) 15:15	202 (1) 90:21	36 (4) 86:10;88:7;89:23; 91:9
		12:13 (1) 135:19	2020 (4) 39:16;40:7;101:13; 105:8	38 (3) 39:14,18;44:16
		12-year (9) 8:10,20,22;15:14; 16:9,11;41:14;57:5; 65:13		3956 (1) 115:11
		13 (1) 84:7		

	56 (3) 40:19;98:19,21	90 (1) 8:4		
4	57 (1) 86:3	97 (3) 19:25;24:7;63:8		
4 (4) 50:12;56:16;58:14; 84:12	5th (2) 129:17;131:24			
40 (4) 8:16;11:5;104:6; 132:19	6			
41 (1) 20:13	6 (1) 50:12			
42 (2) 20:17;39:19	60 (2) 35:7;95:24			
44 (1) 40:20	600 (1) 9:9			
45 (2) 16:9;20:16	605 (1) 12:20			
45,000 (1) 39:13	61 (4) 22:1,3;24:5;61:4			
45,218 (1) 36:15	62,000 (1) 40:9			
47 (1) 40:22	64,000 (1) 40:13			
47,000 (1) 24:22	67 (3) 23:18,19,25			
47,165 (1) 24:22	678 (1) 20:24			
48 (1) 91:18	680,000 (1) 60:11			
48.32 (1) 89:1	7			
49,000 (1) 39:16	72 (1) 36:19			
4th (1) 6:5	740 (5) 9:8;10:1;11:8;13:10; 20:22			
5	75 (2) 8:10;89:9			
5 (4) 21:21;50:12;51:14; 116:15	789 (1) 24:22			
5.5 (1) 14:2	8			
50 (10) 8:18;51:18;56:13; 76:23;77:5,6,18;78:10, 12,16	8 (1) 50:12			
50,000 (1) 39:17	8.3 (1) 57:11			
500,000 (1) 21:6	80 (1) 58:12			
51 (1) 21:15	81 (1) 11:7			
52 (1) 60:6	84 (4) 15:7,14;16:10;36:10			
53 (1) 40:11	85 (1) 88:25			
54 (1) 40:13	86 (1) 23:17			
540 (2) 88:6;89:20	9			
55 (1) 58:8	9:00 (2) 2:1;135:16			