CSO LTCP Public Meeting #3
January 13, 2011 7pm-9pm
Bulmer Telecommunications Center, HVCC

1) Rocky Ferraro: Welcome and Project Introductions
Welcomed all and thanked everyone for attending the third public meeting to discuss the Albany Pool Combined Sewer Overflow Long Term Control Plan.

The purpose of this meeting is to provide a status report on the progress being made to prepare the Long Term Control Plan to address water pollution issues associated with Combined Sewer Overflows in the Hudson River, with the ultimate goal of making the Hudson River swimmable.

This is a significant intermunicipal effort by Albany, Cohoes, Green Island, Rensselaer, Tory and Watervliet. These communities made the decision in 2003 to work together to prepare a single plan with CDRPC as project manager. The consultant, Albany Pool Joint Venture Team is a consortium of three consulting firms: Clough Harbor Associated, Malcolm Pirnie, and CDM to prepare the Long Term Control Plan.

Our agenda for tonight, is to recap the project activities that have occurred to date; review the 2009 Tributary Sampling findings to determine what bacteria contributions and impact the tributaries have on the bacteria counts in the Hudson River, and to discuss the findings associated with the various Receiving Water Quality Model scenarios which will set the stage for the best management practices and control alternatives.

To provide a little history, the structure that we have in place includes a Technical Committee which consists of the Albany Pool Communities, the Rensselaer County Sewer District, the Albany County Sewer District and DEC. We also have a Citizen Advisory Committee which contains a broader range of stakeholders, including the surrounding communities and citizen groups that are fully engaged with the Hudson River and this study.

CDRPC is the manager of the study which started back in 2004. This project is an excellent example of the shared services model; with six communities and the Sewer Districts (which are not directly involved but have been engaged throughout this whole process) working together and putting aside parochial interests the most cost efficient and effective solutions can be identified. This is a roughly $6 million study that has received grant support from EFC (***editor's correction:*** EPF through the Hudson River Estuary Program. Funding has also been received from the US EPA), DEC and DOS. This is a great investment of money, and once the LTCP has been completed, we will need additional funding from our federal and State partners to implement the solutions.

2) Mike Miller: Project Recap
Mike introduced the other presenters: Dr. Greg Daviero with Malcolm Pirnie, Gary Mercer from CDM, and Bob Albright from CDM.

{A PowerPoint presentation was shown, which will be made available on the website} We have been working on this project for quite a while now, and we recognize that it has been some time since our last public meeting, so we are beginning with a quick overview of the public participation plan, a summary of some of the work that has been done to date and then some updates on the current work.

The Technical Committee consists of all six of the Albany Pool Communities, as well as ad hoc members: the Albany County Sewer District, Rensselaer County Sewer District and DEC. We have tried to make the Citizen Advisory Committee very inclusive so that we can keep people informed about the project. All the contributing communities and neighboring communities as well as various regulating agencies and recreational and environmental groups sit on that committee. {Slides were shown of the public participation plan's target audiences and goals.} The Albany Pool Communities are very interested in hearing your thoughts. If you have comments, please come up to the front microphones, and let's get them on record. This is the best way for us to address your concerns. We are trying to make the technical aspects as clear as possible to build general awareness of the issues associated with Combined Sewer Overflow.

The LTCP development process was reviewed. The public participation plan stands over the two major tasks. Our first major task concerned the Combined Sewer System (CSS) characterization, which entailed understanding the baseline, or existing, conditions in the Receiving Waters (Hudson River) and understanding the CSS. We undertook sampling efforts so we could set up models of the CSS and the River as well as wet weather capacity studies at both treatment plants. This is the work has been done to date and we are now working on the Long Term Control Plan development, looking at actually CSO control technologies, funding and the financial implications associated with these decisions and eventually, implementation schedules on the draft document that will go in to DEC.

{An overview of Combined Sewer Overflows was provided; see slides.} In dry weather, normally sanitary wastewater goes into the collection system, which ultimately goes into the interceptor, which brings the flows to the treatment plant. In wet weather there is additional inflow into the system due to infiltration, inflow into catch basins, etc. The CSS is designed to take as much of this flow to the treatment plants as they can, but, relieve themselves when the capacity of the collection system, the interceptors, and the plants themselves are exceeded. They relieve themselves by sending combined sewage to the River by design.

Looking at our study area, the Albany Pool has a very large contributing watershed for the Hudson and Mohawk, covering 8,500sq/mi. There is hydropower on these rivers and a tidal influence below the dam. In terms of some of the work that we have done to date, we started by trying to assess the baseline conditions on the Hudson River. This is the most comprehensive sampling on the River to date. Essentially we took samples during both wet and dry weather conditions for a cost over $1 million. Sampling locations were mainly along the Hudson River although here were some on the Mohawk River and the tributaries in the Albany pool reach. Greg's presentation will address the 2009 sampling

program. Our sampling results found that the River is generally well mixed and suitable for a 1 dimensional water quality model. During dry weather the Hudson and the Mohawk were found to be generally in compliance for fecal coliform. The Hudson was generally out of compliance around the wastewater treatment plants. The tributaries generally exceeded fecal coliform compliance limits with significant problems in the Patroon Creek. The potential downstream beach sites were found to be in compliance. In terms of wet weather flows, the Hudson and the Mohawk were generally in compliance for fecal coliform as they entered the Albany Pool Area; however, the Hudson is almost always out of compliance downstream of the wastewater treatments plants, again in the Albany Port area. The tributaries exceeded fecal coliform limits but the beach sites were in compliance.

As part of the modeling efforts we had to create a comprehensive monitoring program of the CSS. This was a very comprehensive program which was approved by DEC. The plan included 25 flow meters and 4 rain gages, but ultimately the Communities decided to increase the efforts so that we could have a better understanding of the combined sewer systems. An additional 20 flow meters were added, for a total of 45 meters at an additional cost of $176,000. The task was completed in November 2008; the actual monitoring occurred between June and September 2008.

In terms of the modeling efforts, we modeled the interceptors, the overflows and some of the main collector systems that fed in – particularly if there were overflows up in the system. The model was developed to establish existing baseline conditions, and it is also a tool for evaluating the control measures. The model provides us with CSO frequencies, volumes and loads and ultimately these inputs are applied to the Receiving Water Model, which Gary and Bob will talk about a little later. We actually had 4 separate CSS models: Albany County Sewer District North Plant, Albany County Sewer District South Plant, and separate models for both Troy and Rensselaer. These models were calibrated using the 2008 rainfall and flow data. The models were executed for baseline conditions using 5 years of rainfall data for the period 1985-1989, which was determined the best period to get representative rainfall results.

Through the CSS baseline model runs we found that the Albany North Plant has a high degree of capture, capturing 91% of all wet weather flows. Albany South and Troy are down in the 60s, and Rensselaer's system was close to 90% as well. 1.2 million gallons of CSOs are released per year. For more detailed information on any of the previous work, the reports and presentations are available on CDRPC's website.

3) Greg Daviero: 2009 Tributary Sampling Findings

We found in the Receiving Waters Quality Assessment, that the major tributaries in the Albany Pool reach of the Hudson River were out of compliance in both dry and wet weather conditions. This is particularly important because the tributaries run 24 hours per day. CSOs are the result of wet weather, and when it rains, the systems discharge affecting the River's water quality, but the tributaries are discharging and affecting water quality 24 hours per day, every day and for that reason they are particularly important -- important for us to understand how they behave. The Communities decided to go back

and confirm again in 2009 that the tributaries contributed the quality of water that was originally measured in 2008 and at the same time investigate up into the watershed to try to identify where the potential pollutant sources were located, and finally to go to the borders to understand the quality of the water in the tributaries being delivered to the Albany Pool Communities to assess whether the Pool Communities are adding to the problem, improving the problem or causing the problem.

A slide was shown of the sampling locations. We looked at a number of tributaries: Patroon Creek and the Normans kill on the west side of the River, and the Poesten kill, Wynants kill and Mill Creek on the east side. The green dots on the map are the sampling locations. In addition, while we were out there we were also sampling at the most upstream borders of the Mohawk and the Hudson where you see the red lines on the map. Between the time when we originally designed the 2008 sampling program and when we implemented the 2009 sampling program, there was a lot of discussion about the Receiving Water Quality Model and essentially we needed some more information and we took this opportunity to get the data. We sampled in the tributaries throughout the cities and at the locations of the contributing streams to the tributary. In Albany County, the Normans kill was sampled in numerous spots looking to assess what the contributions might be from the Town of Bethlehem. The Patroon Creek was assessed for the contributions from the Town of Colonie. Mill Creek was assessed for contributions from East Greenbush, the Wynants kill looked at possible contributions from North Greenbush, and the Poesten kill, looked at possible contributions from Brunswick.

Similar to 2008, we had dry and wet weather sampling. We did 5 dry weather events, with a dry weather event defined as a period where there were 72 hours of dry weather preceding the sampling. For each dry weather event we sampled at 22 locations – each of the river locations was sampled at the center and at the banks and there were 16 tributary samples. We sampled for fecal coliform, pH, conductivity, temperature, dissolved oxygen, BOD, Ammonia Nitrogen and Total Phosphorus. For the tributary samples we focused on fecal coliform because it is the bacteria that we are attempting to address in water quality to make the river swimmable, but in the course of developing the Hudson River Receiving Water Quality Model, we needed some of the other parameters to provide inputs into that model.

To review, the New York State standard for fecal coliform is a geometric mean of five samples, of less than 200cfu/100ml. The geometric mean is just another way of doing an average: multiplying five samples and taking the fifth root.

{A bar graph was shown of the tributary sampling results for 2008 and 2009.} Each of the bars represented a geometric mean value of five samples. In 2008 we took 15 samples so the first three bars (blue, green and purple) represent the three periods sampled in 2008 (May, June and July). Looking at the Poesten Kill, two of the three periods we looked at in 2008 exceeded the state fecal coliform standard (the red line on the graph). Anything above the red line is out of compliance with the 200cfu/100ml standard. Anything below the line is in compliance. The 2009 data shows some improvement in the Poesten kill. In the Wynants kill, Normans kill, the data generally

supported what we saw in 2008. We did see a change in the Patroon Creek. Sizable pollutant loads were identified in the Patroon Creek in 2008 – the bacteria loads that were coming from the Patroon Creek were similar in magnitude to the pollutant loads coming from any one of the wastewater treatment plants. As a result of the 2008 sampling, the City of Albany and the Albany County Sewer District put a lot of time into attempting to identify some of the sources of the pollutants. They did a lot of independent sampling work which is identified in some of the reports on CDRPC's website. They were able to identify and eliminate illicit connections between 2008 and 2009. The 2009 tributary sampling was able to demonstrate the real impact that their efforts had; there was a significant drop off in coliform counts. This graph is on a log scale: 1 to 10; 10 to 100; 100 to 1,000; 1,000 to 10,000 – so when we look at the Patroon Creek we are moving from numbers on the order of 8,000cfu/100ml down to the order of 300cfu/100ml. It is important to show that the program led to a lot of positive water quality benefits but it is also important to note that the Patroon Creek, as it stands today, is still out of compliance but moving in the right direction. The City and the County Sewer District are still looking for additional illicit connections.

There were a number of new sampling locations in 2009, up into the watercourse, and these are shown on the chart slide. The chart shows the tributary name; where they were sampled; a location identification number, which helped us track where we were; the geometric mean; the direction of flow; and the name of the upstream community. In dry weather sampling there are quite a few numbers in the geometric mean column of 200cfu/100ml or more. In summarizing, the Wynants kill and Poesten kill were in compliance; the flows from North Greenbush and Brunswick appear to be in compliance as they come in to Troy. The Krum kill and upstream Normans kill exceed the water quality standard for fecal coliform, and that is indicating the flows from Bethlehem slightly exceed the water quality standard in the samples that we took. The Normans kill, at the Hudson River, is in compliance. So, although the Krum kill brings in flow which is out of compliance, as it merges with the Normans kill and makes it way to the border with the City of Albany, enough additional flow is brought in to dilute the fecal coliform concentration such that by the time it gets to the Hudson River it is in compliance. Mill Creek sampling locations exceed the fecal coliform standard.

The Patroon Creek still exceeds fecal coliform compliance limits. At the Fuller Road sampling location, we saw a significant exceedance, on the order of almost 1,000cfu/100ml. Still compared with what it was at it entered the Hudson a year earlier – which was on the order of 8,000cfu/100ml – it was significantly better. At the Fuller Road location, we were able to identify an interceptor sampling station where there is some on-going work and this may be the cause of the high bacteria counts but we are still working on this area. Sampling locations in the Town of Colonie, near Palma Park and Corporate Woods Boulevard meet the water quality standard, but the Sand Creek location, exceeded. When we found samples were so high at Fuller Road, it raised concerns about Rensselaer Lake which is immediately upstream, so we did some extensive sampling around the lake and we found that in every case the lake was in compliance with very, very low counts, so the problem is downstream of the lake in the vicinity of the Patroon Creek interceptor. It is important to note that what we did in 2008

identified a problem and communities took hold of it, invested in it and corrected some problems. With the 2009 sampling program we are able to demonstrate that the corrections worked.

We also sampled three wet weather events in 2009. Each wet weather event was preceded by 72 hours of dry weather to simulate what we did in 2008. We wanted rain events that were community-wide. Once rain started, we initiated a sampling program that continued for 48 hours, so all of the locations which were sampled for dry weather were sampled ten times over the course of a wet weather event. Over the course of 48 hours a sampling team went back to each sampling location ten times with generally a four hour period in between each visit. By doing this, we were able to sample water quality as it changed throughout the storm and as it moved spatially downstream. The same parameters that were measured during dry weather were analyzed for the wet weather, but because we had the five sample requirements for a geometric mean this was not a big problem as we had ten samples -- much more than was required.

(A wet weather sample chart was shown) This chart is similar to the dry weather sampling chart, except that there are three columns of geometric means; one column for each of the three storm events. The dry weather geometric mean for each sampling location has also been included as a reminder. There are not a lot of geometric means in the lower values – only two or three are under 200cfu/100ml. Essentially, when it rains the tributaries are out of compliance. This is not surprising as several of them are out of compliance when it is not raining and the rain brings in additional pollutants. Of the three events that were sampled in 2009, the first rain event was fairly large: 1.12 inches of rain. The second event had .34 inches and the third event was 1.19 inches.

In summary, the larger the storm generally the larger the fecal coliform counts. All tributary sampling locations generally exceeded the fecal coliform standard during wet weather, and in every instance, the flows coming into the Albany Pool area from neighboring communities was already out of compliance with water quality standards. Sample locations on the Normans kill showed similar bacteria levels along the length of the stream, and the Krum kill sampling locations had significantly higher fecal coliform counts than downstream Normans kill counts. Both the Wynants kills and the Poesten kill don't show much variation in fecal coliform counts between upstream and downstream—all are out of compliance. The Patroon Creek similarly showed consistent results at all sampling locations; all were out of compliance. However, even under wet weather conditions, the elimination of illicit connections that were made by the City and the Sewer District continue to show improvement in water quality over the 2008 wet weather sampling. Mill Creek showed a slight increase in coliform counts between upstream and downstream.

Ammonia, BOD (Biochemical Oxygen Demand), and the other parameters that were tested were used to support the water quality modeling.

4) Gary Mercer: Water Quality Receiving Model
The Receiving Water Quality Model looks at water quality in the Hudson River. The parameters that we are concerned with are laid out by the Clean Waters Act.

Dissolved Oxygen – is an aquatic life issue; it is required by fish to breathe. The Dissolved Oxygen standard requires a minimum daily average of not less than 5mg/l and never less than 4mg/l.

Fecal Coliform is a concern for public health. The standard is a geometric mean of 200cfu/100ml or less during the disinfection season, which is when people are out boating and recreating. It doesn't have to be met at this time of year.

The other parameter of concern is floatables – these are things that come out of sewer pipes that have a visible sheen, particles, film or grease.

Those are the three parameters that we are really concerned with to judge what we need to do – meeting these standards are what drive the CSO long term control plan. What is it going to take, how much do me have to do, are controlled by the need to meet these standards.

Models are mathematical equations; we use computers to solve them. The models help is to represent what is going on in the River. We use these models to tell us if you did this, what happen to the water quality in the river. These are tools that help us to look at changes, such as what would happen if we eliminated CSOs. These tools are very standard to the industry. The sewer system (collection system) models that Mike discussed are EPA models, they are called SWMM models which generate the flows and the pollutant loads which are inputs into the River model. For the River we have a bacteria and hydraulic model which also used an EPA SWMM model. This is a standard model that EPA developed and we use them in these studies. In the River model we simulate the bacteria – not just the discharge of bacteria from the CSOs and the other sources out there -- but also the fate and die-off of bacteria as it goes down the river system. The hydraulics refers to the depth and velocity of the river. We have to get that right in order to deal with the travel time. For Dissolved Oxygen we use the EPA WASP model to answer those questions.

The water quality model limits are from just upstream of the federal dam all the way down to Poughkeepsie. The model went down to Poughkeepsie because this is stretch of the River is tidal and there is a tidal gage at Poughkeepsie. We also have physical characterization, which is the physical shape of the river. The model includes all the inflow points, which includes all the CSO locations and bacteria loads, the wastewater treatment plant flows and bacteria loads, the upstream loads from the Hudson and Mohawk rivers and all the tributaries. The model also includes the Biochemical Oxygen Demand (BOD) and DO source concentrations.

{A slide was shown of a model cross section of the River.} The Hudson is a big river; one of the largest rivers in the U.S. {Slide shows length of River model divided into

segments} the model is built up in many pieces, each of the green dots on the slide are where the modelers built in calculation points and at any one of those points we can see what the water quality is like. These are ½ mile segments and the model is approximately 80 miles long – 160 segments were put together.

We have to prove that the model is accurate. {A slide was shown with a graph of stage gage data at Albany}. The lighter color is what the USGS gage reported in 2008 between June 5 and August 28. What the model simulated is shown with the red line. We ran this model with rain input, it rains and we are able to predict, fairly accurately the stage gage data. That means that the model is accurate in terms of hydraulics. The bottom graph is the tidal cycle at Albany – every day there is two tidal cycles. Again, the USGS gage is the lighter color and the red line represents the model prediction. That shows we are able to describe the hydraulics through the model very accurately – and that is critical in water quality work.

{A bar graph of the bacteria loads was shown} These are some of the loads that were used in the model. Greg went through some of the counts – these are colony forming units. There are CSOs, Wastewater Treatment Plants, Headwaters (Mohawk and the Hudson rivers) and the Tributaries. The green is what happens in wet weather and the purple is what is happening in dry weather. CSOs happen in wet weather and that shows 1.4 million cfu/100ml – that's a lot – it is slightly diluted sewage so it has a lot of bacteria in it and that is why it is not safe. You'll note that in dry weather it is zero because we don't have discharges from CSOs in dry weather, whereas, if you look at the treatment plants, that are not disinfected, they are very similar in wet and dry weather. And that is a fairly high number at around 69,000cfu/100ml and the flows are fairly high. The sewer districts and communities are underway now to disinfect those treatment plants and we'll show you the impact that this will have on water quality later. The headwaters in general are pretty much in compliance in dry weather. In wet weather it is in compliance some of the time and at times not in compliance. We talked about the tributaries and this is an average of all of the tributaries using the 2008 data. Overall the Hudson at the headwaters is pretty clean, not quite meeting the standard in wet weather but as it goes through this system it picks up discharges from the treatment plants, discharges from the tributaries and when it is raining, discharges from the CSOs. So we look at all this information and we can ask what would happen if we disinfect the treatment plants – what will we see in terms of improvements to water quality? That is the value of the model we used here.

The other thing we do is validate the model the cross sections {a graph was shown} the red dots are the bacteria sample results that we collected in 2008 at one sampling location and the blue line is what the model predicts the bacteria would be a that location. So for much of the dry weather you can see that the Hudson river is around 200cfu/100ml those little blips up in the model are wet weather events. So we get a rainstorm and the bacteria jumps up sometime over a 1000cfu/100ml and sometimes over 2000cfu/100ml. This was a model calibration that shows we are able to predict what is going on in the river fairly well for water quality.

{A table showing scenario results was shown} Baseline is the conditions that existed in 2008; in each of the scenarios we have made various changes to wastewater treatment plant disinfection, headwaters water quality improvements and CSO capture. The last column is exceedances, which looks at out of 30 months, how many months are we exceeding water quality standards for each scenario. As a goal we'd like to have zero exceedances and we use 30 months because that equals five years of recreational seasons (5years x 6 months). Current conditions in the baseline are where wastewater treatment plants are not disinfected, the headwaters are as we measured them, the tributaries as we measured them in 2008, and the CSOs as they are now. In this five year period of recreational seasons we would exceed the water quality standards for all 30 months; currently we do not meet the standards. I don't think that this surprises anyone. So we went through these scenarios were we could turn down the loads associated with certain activities.

In the first scenario we had disinfection at the wastewater treatment plants, so we turned down the load at the treatment plants, headwaters are the same, tributaries are the same and CSOs are the same and you can see it comes out to only 2 months out of that 5 year period of time where water quality standards are exceeded. Treatment plants are on 24 hours a day, 7 days a week, 365 days a year and they put out a pretty good load. With bacteria compliance it is not just the concentration but how much of the time it is discharging that has an effect. Plans are underway right now for disinfection at the wastewater treatment plants and they will be disinfected so there should be a substantial improvement on water quality in the Pool area before any other work is done.

In scenario 2, the treatment plants were disinfecting and we improved the headwaters in wet weather, we improved the tributaries to meet standards, and we left CSOs alone. We improved the headwaters because there is work underway; municipal work with EPA, to improve the stormwater side and we wanted to reduce those concentrations down so that we could see how much of an effect stormwater had on water quality. In this scenario we see zero months of non-compliance, basically CSOs, while they have a high concentration do not have enough volume to cause those exceedances. The Hudson River is a very large river and the CSOs here just don't have a large impact.

Scenario 2A is similar to scenario 2: the wastewater treatment plants are disinfecting, the headwaters are improved because the treatment plants upstream will be disinfected. We also improved the tributaries, not to the standard but to what we saw in 2009 (particularly the Patroon Creek) – so they are still not meeting standard but they are improved and CSOs are as they exist today and we still meet the standard with zero months of violations.

Scenario 3 looked at the CSOs and whether CSOs are a big player in meeting standards or not. In 3, we did treatment plant disinfection because that is a planned improvement that is underway, the headwaters and tributaries were left alone, and we went to 85% capture of wet weather CSOs and we still end up with 2 months of violations – that is the same result as scenario 1. So whether we did capture 85% of CSOs or not we were not

affecting the 2 months of violations. You can do CSO control but it is not going to be enough to affect the water quality.

Scenario 4 looked at only doing CSO control and here we had 30 months of non-compliance. This really comes down to CSOs are not a very large load. The wastewater treatment plants as well as the headwaters and tributaries have a much greater role and will get improvements to water quality. This is fairly unique in the US. It has to do with the Hudson River being a very large and rapidly moving river. In general the River is in pretty good condition, but with this work it'll be in better condition.

We also looked at the DO (Dissolved Oxygen) and this is not unusual. The CSOs do not provide a lot of the BOD (Biochemical Oxygen Demand) load which causes the dissolved oxygen problem. There were some noted low dissolved oxygen readings at Henry Hudson Park and Schodack Island but they were not associated with CSOs, they seemed to be more of a dry weather question and we showed to the State that CSOs have no effect on dissolved oxygen levels.

Some of the general observations that we made from the bacteria model were that the River has a large assimilative capacity shown by the steady decline in frequency of bacteria exceedances as the flow passes downstream. This large river with relatively low mass is rapidly moving. Seasonal disinfection of the wastewater treatment plants significantly reduces the frequency of bacteria exceedances at all river transects. We looked at all river locations downstream and this had, by far, the largest influence on the system. And, bacteria contributed by the headwaters and tributaries greatly influence the frequency of bacteria exceedances in the river. So overall, it is the treatment plants and the tributaries that have a greater influence on bacteria and water quality. CSOs do not preclude the Hudson River attaining water quality standards. No matter what we do, the CSOs are not going to affect the results for attaining water quality standards. We expect the water quality standard to be met with implementation of the disinfection at the treatment plants and the improvements to the headwaters and tributaries and again this is because the continuous bacteria loads have the biggest impact on water quality.

We are looking to do the Demonstrative approach to CSO control. In the CSO policy provided by EPA there are two approaches that can be used the Presumptive and the Demonstrative approach. In the Demonstrative approach you demonstrate that your program is going to meet water quality standards. What we are now moving into is the next phase of the project where we will focus on best management practices, system optimization – getting more flow to the treatment plants – disinfection and floatables controls.

As a regulatory update, we had a model report on the model validation which was submitted to DEC in August and after a meeting to view it with them they approved the model and our findings from the model and this puts us on track to do the Long Term Control Plan.

5) Bob Albright: Schedule Update/Moving Forward
In the early stages of our presentation, Mike, Greg and Gary walked you through a lot of the work that has been done: the sampling efforts, the development of the models which are the predictive tools that we will use in developing the alternatives for addressing recommendations for dealing with the CSO overflows.

There were some adjustments along the way to the scope because of the findings in the 2008 monitoring efforts. We did some extra collection system and tributary sampling. We also expanded our scope for receiving water modeling. As such, we did request to extend our scope and that was approved, giving us until June 2011 to complete that plan. This provided us with sufficient time to develop additional data that we could use to make good decisions on how to proceed.

As we move ahead with taking a look at the various alternatives we could use to approach the CSOs, we take a step back and look at what goals we are trying to accomplish; what are the uses for the river. The Hudson River is a Class C river, the primary uses are fishing and fish habitat, recreational boating, and other primary and secondary contact recreation activities. The intent is to protect the general public for health hazards, primarily from the bacteria associated with the CSO discharges. We also wanted to take a look at accommodating the swimming and bathing that may take place should the future beach sites be developed. The focus would be on the May 1 to October 30 recreation season which coincides with the seasonal disinfection plan at the treatment plants. We also want to look at supporting riverside economic development; a clean waterbody encourages economic development and growth along the waterbodies.

As we move ahead, our strategy will be as follows. We talked about both the Presumptive Approach and the Demonstrative Approach. Essentially the Presumptive Approach assumes that as long as you develop a plan that captures 85% of the CSO it presumes you will be in compliance with the water quality standard. In the case of the Demonstrative Approach, you build projects and then measure the benefits to the water quality after those projects are complete. It gives you a better sense of where you started where you are and what you may need to do in the future for additional benefit. It also allows you to build a project that is a little more efficient and then make changes as you go as things may change over time; as we saw there were changes between 2008 and 2009 in the tributaries because of the work that was done by Albany County to correct some of the illicit discharges that were found.

We will be looking at a tiered approach. Our tier 1 projects will consist of projects that have been completed to date such as sewer separation projects. There are some storage facilities and other improvements to the collection system that have been performed, recognizing the benefits to CSO control. We will also be looking at projects that are required to achieve the current SPDES permit requirements. Tier 2 projects will consist primarily of best management practices, and other improvements that the communities need to implement over a longer period of time to keep their system in compliance with their permit as well as the CSO policy. The systems are old – many of them are hundreds of years old - some of these systems are brick and older materials that are in need of work

and there needs to be a plan in place to keep those systems operating efficiently and effectively for the communities and the users.

We are in the final stages of completing the evaluations of the treatment plants to get a better understanding of how they react to wet weather and how much more wet weather we may be able to direct to those plants. We are going to look at the collection systems in each of the communities; look at areas where there are bottle necks and issues with being able to convey that flow to the treatment plants. We will look at it from both the east side and the west side; we have a system on the east side where flows from both Troy and Rensselaer to the Rensselaer County Sewer District and most of those flows are pumped to that facility. The characteristics of the system are a little different than on the west side, where most of the system is gravity fed and goes to two different treatment plants. So there may be different ways of approaching the controls when we look at the east and west sides. Then we'll take a look at the Regional approach; there are some CSOs that are extremely large and if we focus on one large CSO in one community it may help provide a lot more benefit by tackling that low hanging fruit in comparison to a number of smaller CSOs that may only discharge a few times a year at smaller volumes. The focus of the program will be on the higher volume, higher frequency overflows and trying to attack the program as efficiently as possible, and to focus on bacteria as well as floatables control.

We are in the process of evaluating funding opportunities and the financial impact on the communities. Looking at what the communities can afford, there are certain criteria that the US EPA looks at for evaluating CSO projects. We are going through that analysis right now to get a feel for what each of these communities can afford without a major impact and what the EPA may expect from them from a financial standpoint.

Once we have determined the projects, we will look at how we might implement those projects by putting them in a series that makes sense. Taking a look at various projects, starting with addressing the compliance issues for particularly areas where there might be dry weather overflows or the potential for dry weather overflows, and where we can get more flow to the plant and get immediate benefit and then work on other projects that with time will enhance the work that is done with the tier one projects. We will then prepare a long term control plan which will lay out those projects and the schedule for implementation. We will present that to DEC and the Technical Committee and then present it to the public for comment.

We have had three public meetings to date, our fourth meeting will be sometime in the spring of 2011, late spring is most likely. This will focus on the CSO control evaluations and presenting the plans that are to be developed over the next two to three months.

6) Question and Answer

Phil Hansen, representing the Albany Rowing Center: What is a monthly exceedance? I understand the over 200 cfu/100 ml on an instantaneous basis where you've exceeded the water quality standard but what is the definition of a monthly exceedance?

Gary Mercer: We took 5 random samples over a 30 day period and we did that over 10,000 times to see no matter how many times you took it whether it would still have a geometric mean under 200 cfu/100ml. It is a monthly standard that they look at; they take 5 samples in 30 days. So we judged in that period how many times out every 30 days in the 30 month period would you not meet that standard. In scenario 1 we had two months of exceedances. The five samples can be taken over a shorter time but they say out of 30 days. So it is 5 samples in a month and if you multiply them and take the fifth root of them you end up with a number under or over 200 and we were consistently always under 200, so no matter what 5 samples you took within that 30 day period it was always under 200, except in a few cases there were 2 months where we would not get under 200. Does that answer your question?

Phil Hansen: I'm not sure. What I'm trying to understand is if you had an exceedance one or two days a month – it was 1000 cfu/100ml…

Gary Mercer: You don't have to be less than 200 cfu/100ml on every sample. You can actually have 4 samples of 100 cfu/100ml and one sample of 2,000-3,000 cfu/100ml and still get a geometric mean under 200. So it doesn't mean that every sample has to be under 200, you can have some high ones and some low ones.

John Lipscomb, Riverkeeper: My comment is not a criticism of your methodology, it is more a statement about the whole New York State standard. Since the goal here is to ultimately protect the public from contact with bad water we use the standard as a surrogate for that but right there we have a flawed process. If you are out there rowing and you are rowing on a month that meets water quality standards on Riverkeeper's sampling we have many, many days where the counts are extraordinarily high but yet when you do a geometric mean it passes. And the problem that comes with a rower or a tuber is not that they are there on an average day, they are there when they are there. Again, I understand you are working within a constraint that you are given to work within but I would urge you to find, before we define that CSOs are not an issue, which they are not when looking at a geomean, but they certainly are if we are looking at extremes. Using geomeans to look at something that is episodic is very flawed. It is a comment I've made before and I just need to make it again because this is the type of question I hear all the time from the public. Our data for this upper section shows days where the counts for Enterococcus which is EPA's preferred bacteria over Coliform or E-coli but it is a different number, instead of 200 it's a single count of 61; anything over 61 is a failure. We have days where we can't count high enough and we can count 400 times the water quality standard, so our systems backs us out; you guys have the same issue. It is such a wonderful effort to try to make the water better, but I think the public is going to have a very hard time dealing with the constraint of the geomean because it really doesn't address the super, super intense pulses that come with CSOs. And I understand that over a month with geomean it is not significant but the day it is happened or the day after it happened it can be extraordinarily dangerous, so I don't know quite how as engineers looking at this you can factor that in but I think you should try to factor it somehow.

Garry Mercer: I'm not saying right now that the Hudson River is safe; it doesn't meet standard now but we are expecting a large improvement. As you say, there are high counts there now but there is a lot of work planned that will reduce a lot of those counts, so we are talking about residual problems with CSOs and they do discharge. But part of the thing is once the treatment plants are disinfected and there is the clean up of the creeks, we expect those numbers to come down more. The standard is the geomean and it has been in this State for many, many years and this State has deemed it protective of public health. EPA, 1996 criteria was moving to E-Coli, Entero's out there and the EPA is doing more work on this. It is always difficult because this is a risk based standard which looks at the fact that we can never get to zero risk, we have to have some acceptable level and they approach the geomean knowing that it is a very dynamic system. I don't disagree with anything that you are saying but I do want people to realize that we are looking at improvement and the states may look at different standards and we are looking at those standards so we know what is going on with this program if something else happens, but at the same time that is the current regulation. That has been in place for many, many years and has been deemed adequate to protect public health by many states.

John Lipscomb: We are all talking the same language but I'm coming as a representative of the public and the problem isn't you guys, it's the standard. We have to find some way of dealing with the fact that the standard doesn't quite cut it. So, the beaches for example, one of our sample sites is down at Gayes Point where there is huge public pressure and yes the water passes geomean but we have days there where the water is really bad. I don't know the solution, but if we are going to have geomean as the standard, which it is in New York State – not adequate clearly – we have to come up with something else for the public, because if we say it passes on the geomean are we saying swim any day? if we are, we are not really giving the public the right information and that's where I come up with this dilemma. If we say it has passed 30 months out of 30 and therefore that we have achieved water quality standards and therefore you can get in the water we aren't doing justice to the public.

Bob Albright: One of the benefits with the strategy that we are taking (the Demonstrative Approach) is that it will allow us to build the disinfection facilities at the treatment plants, it will allow us to make those improvements to take care of some of the tributary waterbodies which are the 24/7 day-to-day contributions of bacteria and it'll give us a chance to get a good handle on how well our model has predicted the benefits of those improvements to the treatment systems and collection systems. To go ahead with the 85% capture under the Presumptive Approach would just put the blinders on and say, we are just going to capture this much and we are going to assume that it meets water quality standards. At least we can take a stepped approach, use common sense, and evaluate what we do. Should the bacteria standards change over time we can adjust to that and also recognize the CSO policy requires as we develop a program that we need to take into consideration that although the model and our analysis may show that we meet the water quality standard, should the sampling program show in the long run that there is still an issue, we will need to go back and do some more to bring the receiving water into standard.

John Lipscomb: No, I think that is excellent; the do and check and do and check approach is rational but the one hitch is if in your check we are still doing the geomean and we are looking at episodic dumps from CSOs that is not entirely rational. So I would hope that we would go beyond the minimum requirement of the standard and do testing for extremes in addition to the geomean in our checks and by doing that we will be able to see that if by passing the geomean we still have hazardous conditions at times after we have taken these initial steps. I don't know enough to say, the Federal standard has a geomean and a single sample standard so the geomean standard for Enterococcus in freshwater is 33, the single sample is 61, so if you had a beach you would have to close the beach if you exceeded that single sample 61 or the geomean of 33. So there is in the federal standard a requirement to look at single samples as well as a geomean and that is what I would urge us to do whether we need to or not because then we are really answering the question.

Bob Albright: There are other things that can be done, but one of the things is developing the bounds between cost and benefit. How much money do you throw at the problem to maybe get one more day of compliance? If you have to throw $3 million at the problem just to get a couple of extra days of time to swim in the river is it worth it, is it going to have a tremendous financial impact on the communities and that is part of what we have to weigh as part of developing this program. One of the things some communities have done is put automated websites where they look at rain events and as a predictive tool they will give the public a sense of the general risk of going into the water after that storm event and how soon the bacteria may subside and when it would be safer to go into the water. That is another option for reducing the risk to the general public and educating the public; giving them a tool to make better decisions about when they go row or swim if it should be found that to get it that point that you talk about – dealing with peaks – it is so expensive, that this may be the better option to control and protect the general public.

John Lipscomb: That predictive modeling would be great. Without predictive modeling then it is really tough to do that cost-benefit. I've met a family where the father had to give a kidney to the kid because the kid got E-Coli and lost his kidneys. And so if you ask that family, they are going to say the cost is worth it. But as the perfect world isn't attainable, if there were a long term goal in your build, check, build, check, if there were predictive modeling in there that would be an excellent, precedent setting thing for New York State. That would be very supported by the public.

Greg Daviero: What we need to keep in mind still is that the communities are currently under a program where they have a deadline to meet and the deadline has to be defendable based on the rules of today's game. So the rules of today's game are clear and those are the ones that the communities have to rely on. To sit here and speculate where the water quality standard may or may not go is an interesting conversation, but no one in this room knows the answer. Our program is still due June of 2011, so we have to move forward with the rules that are in place with a program that is nimble enough to perhaps adjust if the rules were to change, but is appropriate for the rules of today. The other thing I wanted to point out is your comments about your sampling that is ongoing

now, I appreciate because they are consistent with what we found in 2008 and what Gary presented – that it is out of compliance now. So it is not surprising now that although you are using a different indicator you are seeing consistent water quality standard violations.

John Lipscomb: I appreciate that you have to answer the communities – the client – under the rules of today and I'm not suggesting that you try to anticipate how water quality standards are going to change. I do think that as you are charged to advise the communities there is some merit on educating the communities on ways, such as predictive modeling, to further protect the public if they so choose. They are not going to come up with it on their own – that's where your training could advise instead of just the literal scope.

Bob Albright: We have presented that to the communities. It is a project that we have done in the Philadelphia area and the communities are aware of this as an additional tool.

Mike Miller: I think it is also worth remembering that there are two goals: one is to meet current water quality standards and the second one, which you are concerned about, is when is it safe to go in the water. There are certainly guidelines that could be developed, and tools that could be developed as part of the continuing monitoring plan. Certainly as the improvements come online, water quality is going to continue to change and so it would have to be continually updated, and something like that could be looked at as part of that program.

Dominick Calsolaro, City of Albany Common Council Member: Who has to approve the Long Term Control Plan – is it just DEC, or is it EPA? And in the Long Term Plan are you going to have estimated costs for the program and how it is going to be distributed among the municipalities and how it is going to be paid for? And third, what is the deadline for when this plan has to be put into effect. Thanks.

Bob Albright: The program will be reviewed and approved by DEC. We have given them updates throughout the process. Typically US EPA does also look at the plan and provide their thoughts. The plan will include costs and the affordability to the communities. Eventually there will be some type of method developed for dividing the costs among the communities. The main focus right now is on creating a plan that meets the Long Term Control Plan objectives, and is approvable by DEC, and get that in by the June deadline. The implementation schedule is typically negotiated with DEC. A lot of that depends on the costs of the program and its affordability to the communities; a means of making it more affordable is extending the schedule out. There may also be certain projects that should be done first, evaluated, and then additional projects developed and performed after those projects. You may also have an area that may be of concern where there is too much going on in one area, where multiple projects could cause traffic impacts, impacts to businesses and the community, there may be a need to space those projects out. All those things would be taken into consideration in the schedule included in the long term control plan and would be discussed as part of the approval process with the regulatory agencies.

Joe Cuniff, Council of Albany Neighborhood Associations: First I want to thank Rocky and his staff for reorganizing the website so it is easy to find documents. At the last CAC meeting, part if the presentation included development of some zones around highly used areas along the River where you would try to avoid floatables showing up there. I didn't see anything about that in this presentation; what happened to that idea?

Mike Miller: We are still evaluating it. Based on the input from the Citizen Advisory Committee we are going back a step and re-evaluating how we are going to reach that. We are still looking at floatable control, for the sensitive areas and recreational areas along the River but we felt that this was not what we wanted to focus on at this meeting because it felt like a better tie in with the presentation on the CSO technologies and the alternatives so that we can do a better job of explaining that to the general public.

Joe Cuniff: This is the development of a long term control plan for CSOs – I believe that is what it is supposed to be – and most of this presentation as I mentioned at the CAC meeting shows that you get a better bang for your buck by controlling other things such as the tributaries and the treatment plants. So in the end is it going to be a Hudson River water quality long term control plan or is it going to be a CSO long term control plan? And how will DEC react to what might be not so much a CSO control plan but a River water quality control plan?

Gary Mercer: One of the things you have to do when you look at CSOs is put everything in context, so how much are CSOs doing and what are each of the other sources doing. Because you want to know if what you are putting in the long term control plan is going to get you water quality results or what else is out there. So we end up looking at all the other sources to understand what CSOs do or don't do to the system; like anything before you do your part you have to understand the big picture. This will be a CSO plan but we will be measured on how we will improve water quality standards so we have to talk about what else is going on: the treatment plant work, the tributary work to put this in context.

Tracy Brown, Riverkeeper: Are there plans now as part of your Tier 2 projects to address some of the other tributaries in addition to the Patroon?

Greg Daviero: I've emphasized the Patroon in the presentation because things were found and benefit was measured, so in the course of doing the 2009 sampling one of our goals was to look and see if we could identify other contributors to the tributaries. So I pointed out the easy ones all the communities are actively pursuing projects on illicit discharges. In terms of the other tributaries are you referring to tributaries outside of the Pool communities?

Tracy Brown: At the CAC meeting that there was a lot of complexity around cleaning up the tribs and that because the Patroon was so extreme you had already done some investigation and that action was happening but there was an indication that maybe the

other tribs would not be pursued because of the intermunicipal complexity and so I'm wondering if there has been any change on that that you could share.

Greg Daviero: I don't think we have anything else to share.

Mike Miller: Based on feedback from talking to CDRPC and some of the other people that are involved at the municipal level we have to put it in context. We just presented those results to those adjoining communities at the CAC meeting which was roughly 3 or 4 weeks ago. I think it sparked some conversation, I think there has been some follow up conversations, follow up inquiries but it is still early in the game but I think time will probably give us better direction on that.

Tracy Brown: So then as part of your process (sorry I just don't understand the mechanics of the process) but when you list those Tier 1 projects are those ones that you initiate or just recommend or is this just an on-going conversation with the communities and they opt in and opt out?

Mike Miller: Under Tier 1 projects I think there are a couple of things that fall under that classification. One, things that they've already got planned in their Capital Improvements Plans because they know they want to maintain these improvements and they will have a water quality benefit. There are further actions that some of these communities are working cooperatively with DEC to resolve some outstanding issues in the system. So those are projects that will be cooperatively done in conjunction with negotiations with DEC.

Greg Daviero: The disinfection projects as well. They are permanent driven projects that have a direct impact on this program – that's a Tier 1 project.

Tracy Brown: And the Tier 2 projects are more ones that they initiate, or you recommend and maybe they take up ?

Mike Miller: Tier 2 would be something more along the lines of specific floatables control and plans that are more driven by the CSO program specifically and things that we've added that we think they need to do to come into compliance with the permit.

Bob Albright: Tier 2 may also include other projects where there are important areas in the system that should be looked at to avoid the potential for catastrophic failure or some other issue that could be causing exfiltration to a neighboring creek that could have a bacteria impact on that creek. Those are things we are working with the DPWs to walk through various investigations they've done on their sewer systems and try to help them prioritize where they are going to get the best bang for their money and over time what other things they should be looking at in order to keep the system in the condition that maintains the flows to the treatment plants to maximize the best water quality benefits by treating those flows. Then also protecting the system from collapse that could cause basement back ups, street collapses and other impacts; or blockages and other problems that affect the collection and conveyance of the wastewater to the treatment plant.

Greg Daviero: One of the things that we presented here, in summary, was the combined sewer system models and then the results of those models basically in millions of gallons of overflow per year. Those tools are now at our disposal and we are using them to identify the components and their systems so that we can, in a low cost way propose minor changes to the system that may significantly reduce the overflow volumes. The best way to prevent a floatable going into the River is to not have a discharge. So we are using that tool to optimize the systems, so you didn't see in summary here tonight that there's a baseline condition and an optimized condition where each one of those sewer system models have been altered in some way that will later become a real project that will have a benefit. Those are the types of things we're identifying and evaluating in addition to the floatables control.

Rocky Ferraro: Let me also respond to the geographic reach when we first looked at this project six years or so ago we recognized that even though the Albany Pool Communities had a legal responsibility to prepare a Long Term Control Plan as a condition of their SPDES permit renewals, we recognized that there may be contributions coming from outside communities. As a result when we scoped out the project and in getting the stakeholders together we recognized that it wasn't just the six communities but the broader geographic area including the surrounding communities which is why the Citizen Advisory Committee specifically includes representatives from those surrounding communities so that they are aware from the get-go of the issues and potential responsibilities to address it. Since then, as I'm sure most of you are aware, with the new Stormwater management regulations that are in place for the surrounding communities (they are called MS4 communities), they have a responsibility to address stormwater management issues in terms of their system in a much more aggressive, proactive manner than they had done historically. With the new guidelines the communities are specifically responsible for projects and how they will impact the stormwater system and they have to adhere to the guidelines in the Stormwater Design Manual. So, we are seeing, as we move forward, improvements that we expect to take place throughout the entire system based on their responsibilities.

Fran Dunwell, Hudson River Estuary Program: We have an action plan for the Hudson that tries to help the river attain that goal of swimmable, no just for meeting the standards but also to make it safe for people to swim and have contact with the water. I want to comment that I think the model you've built is really useful to show the impact of things that we are doing already and helps us demonstrate that huge impact as these projects come online. I was very interested to see the whole picture and not just the CSO portion of it, but how the different pieces fit together. It may help us identify those spikes, even if you are not doing that geometric mean, we could use the model to predict and generate those spikes for analyses.

Rocky Ferraro: Certainly in terms of the evaluation that has been done to this point, short of being able to solve all of the problems all of the time, some type of a warning system or indicator that there is going to be an event that according to the models we have done, you may want to be cautious, similar to the traffic cameras that we have on our website

that get a lot of hits, something similar to that could be easily posted as a cautionary. As was talked about earlier, making the public aware that the problem is not solved 100% of the time, there are going to be spikes in the activity and here is a warning system for when that may be occurring based on what we've established vis-à-vis the model.

Fran Dunwell: The Riverkeeper website has demonstrated that the public is very willing, and is very anxious, to find that kind of information.

Rocky Ferraro: I want to thank everyone for attending. As you can see it has been a fairly exhaustive study to date. I think the time has been invaluable in preparing it and we have a heck of a lot of good information for what should come up in evaluating the measures. We are entering the next critical phase, in terms of those practices and mitigation strategies that are necessary to move forward and achieve the goals that were outlined tonight. I hope you have an appreciation for the depth and breadth of what has been undertaken and certainly I am pleased, as I pointed out earlier with the cooperation and involvement of all the stakeholders; particularly the six Pool Communities and the two Sewer Districts. As has been pointed out, we have had a transparent process and have been keeping everyone involved throughout the entire process not just at critical junctures and the website is one of the means where this has taken place. Please feel free, we do post everything on the website, to check out any updates on that information. Deb Shannon from our office has been the day to day point of contact for this project. Please feel free to contact our office with any questions.

Meeting adjourned.