NATIONAL INFRASTRUCTURE ADVISORY COUNCIL

QUARTERLY BUSINESS MEETING AGENDA

September 11, 2015
1:30 PM – 4:30 PM EDT
Navy League Building
2300 Wilson Blvd. Arlington, VA 22201

I.	**OPENING OF MEETING**	*Ginger Norris,* Alternate Designated Federal Officer (ADFO), National Infrastructure Advisory Council (NIAC), Department of Homeland Security (DHS)
II.	**ROLL CALL OF MEMBERS**	*Ginger Norris,* ADFO NIAC, DHS
III.	**OPENING REMARKS AND INTRODUCTIONS**	*Constance H. Lau,* NIAC Chair *Caitlin Durkovich,* Assistant Secretary for Infrastructure Protection, DHS *Stephanie Morrison*, Director, Critical Infrastructure Protection Policy, National Security Council
IV.	**APPROVAL OF JUNE 2015 MINUTES**	*Constance H. Lau*, NIAC Chair
V.	**PRESENTATIONS** **WATER RESOURCES (GROUNDWATER AND SURFACE) AND WATER SUPPLY (TREATMENT AND DISTRIBUTION); URBAN STORM WATER: CONVEYANCE AND TREATMENT; WASTEWATER: COLLECTION, TREATMENT, DISPOSAL AND REUSE**	*Adam Krantz,* Chief Executive Officer, National Association of Clean Water Agencies *Adel Hagekhalil,* Assistant General Manager, City of Los Angeles Sanitation

VI.	**WATER SECTOR RESILIENCE WORKING GROUP PRESENTATION: SCOPE, PROPOSED APPROACH, AND SCHEDULE**	*Jack Baylis,* Working Group Chair
VII.	**PUBLIC COMMENT: TOPICS LIMITED TO AGENDA TOPICS AND PREVIOUSLY ISSUED NATIONAL INFRASTRUCTURE ADVISORY COUNCIL STUDIES**	*Ginger Norris,* ADFO, NIAC, DHS
VIII.	**WATER SECTOR RESILIENCE STUDY DISCUSSION AND DELIBERATION ON SCOPE AND RECOMMENDATIONS**	*Constance H. Lau,* NIAC Chair
IX.	**CLOSING REMARKS**	*Constance H. Lau,* NIAC Chair *Caitlin Durkovich,* Assistant Secretary for Infrastructure Protection, DHS *Stephanie Morrison*, Director Critical Infrastructure Protection Policy, NSC
X.	**ADJOURNMENT**	*Constance H. Lau,* NIAC Chair

NIAC MEMBERS PRESENT IN ARLINGTON:

Mr. Jack Baylis; General Albert Edmonds (ret), Ms. Peg Grayson, Ms. Constance Lau, Dr. Beverly Scott, Mr. James Murren

NIAC MEMBERS ATTENDING VIA CONFERENCE CALL:
Mr. James Reid, Mr. Thomas Noonan

MEMBERS ABSENT:
Mr. David Bronczek, Mr. David Grain, Mr. Philip Heasley, Mr. Michael Wallace, Mr. Bruce Rohde

SUBSTANTIVE POINTS OF CONTACT PRESENT IN ARLINGTON:
Mr. Richard Houck POC for Ms. Constance Lau
Ms. Bianca Mallory POC for Dr. Beverly Scott

SUBSTANTIVE POINTS OF CONTACT OBSERVING VIA CONFERENCE CALL:
None

OTHER DIGNATARIES PRESENT:
Ms. Caitlin Durkovich, IP, DHS; Ms. Stephanie Morrison, NSC

I., II. OPENING OF MEETING, ROLL CALL	*Ginger Norris,* Alternate Designated Federal Officer (ADFO), National Infrastructure

Advisory Council (NIAC), Department of Homeland Security (DHS)

Ms. Norris opened the meeting and called the roll. Upon completion of the roll call, she turned the meeting over to Ms. Constance Lau, NIAC Chair to preside over the rest of the meeting.

III. OPENING REMARKS AND INTRODUCTIONS

Constance H. Lau, NIAC Chair

Caitlin Durkovich, Assistant Secretary for Infrastructure Protection, DHS

Stephanie Morrison, Director, Critical Infrastructure Protection Policy, National Security Council

Ms. Lau welcomed everyone to the fall quarterly business meeting (QBM) of the NIAC. She said she thought it was particularly apropos since September is National Preparedness Month. In addition, she acknowledged that it is September 11th, a day to remember where the origins of the NIAC came from the charge the Council has to help protect the nation's security and make sure the country is prepared. She said the course of business for the Council will be to commence their study on resilience in the Water Sector, which will be led by Mr. Jack Baylis. The study would kick off with a couple of presentations today by Mr. Adam Krantz, and Mr. Adel Hagekhalil. She welcomed Ms. Caitlin Durkovich from the Department of Homeland Security (DHS), as well as Ms. Stephanie Morrison from the White House and thanked them for coming. At this time she invited Ms. Morrison to make introductory remarks.

Ms. Morrison said that this is her second NIAC meeting and she is looking forward to hearing the conversation. She said the nation faces diverse threats and hazards that challenge security and resilience, further confirming the need to strengthen national preparedness. The NIAC plays a critical role in providing recommendations to the President on how to strengthen critical infrastructure security and resilience. She said they are very appreciative of the hard work of the NIAC. Last week they formally received NIAC's most recent study on transportation sector resilience. They are in the process of reviewing and look forward to working with the NIAC on the recommendations. She said she very much looks forward to today's conversation, particularly in regards to the new water sector study. Ms. Lau thanked Ms. Morrison for her remarks and invited Ms. Durkovich to speak.

Ms. Durkovich thanked Ms. Lau. She said she felt it was rather fitting that they were holding the meeting on September 11th because 14 years ago, our adversaries weaponized critical infrastructure and flew it into critical infrastructure. The work of this Council to insure security and resilience of the infrastructure that underpins our economy and national security is so critical. She said she started the morning at a field in Clinton, MD gathering produce for "Feds

Feeds Families", before coming to the meeting. She said it was a nice way to mark this very solemn day. She said as always she wants to commend the members for the extraordinary work they do in addition to having day jobs. Publishing three reports in nine months was a remarkable feat and she thanked them. She said she thinks this is an exciting new project to go along with the previous studies on energy and transportation.

Ms. Durkovich said she would like to take a minute to express DHS' gratitude to Ms. Nancy Wong for her many years of service and dedication to this Council. Ms. Durkovich said Ms. Wong has dedication, expertise and knowledge on all of the issues that DHS works on. Ms. Durkovich said that while Ms. Lisa Barr and Ms. Ginger Norris are the incoming Designated Federal Officers, Ms. Wong will continue to share her knowledge and mentor the new DFOs. She thanked Ms. Wong again and the Council and spectators applauded. Ms. Durkovich said she would also like to thank the members of the new Water Working Group, General Al Edmonds, Ms. Peg Grayson, and the chair, Mr. Jack Baylis. The topic is water sector resilience. She said she looked forward to this afternoon's meeting. She then turned over the meeting to Ms. Lau. Ms. Lau also thanked Ms. Wong and hoped she would continue to stay involved with the work of the Council.

IV. APPROVAL OF JUNE 2015 MINUTES — *Constance H. Lau,* NIAC Chair

Ms. Lau said the first order of business is to approve the minutes from the last QBM, which were in the materials distributed in advance of the meeting. She asked if the Council had any changes to the minutes. There were no changes expressed. Ms. Lau asked for a motion to approve. General Edmonds moved and Mr. Baylis seconded. Ms. Lau asked all those in favor to say aye, and all opposed to say no. There were none opposed and the minutes were approved.

V. PRESENTATIONS — *Adam Krantz,* Chief Executive Officer, National Association of Clean Water Agencies

WATER RESOURCES (GROUNDWATER AND SURFACE) — *Adel Hagekhalil,* Assistant General Manager,

AND WATER SUPPLY (TREATMENT AND DISTRIBUTION); URBAN STORM WATER: CONVEYANCE AND TREATMENT; WASTEWATER: COLLECTION, TREATMENT, DISPOSAL AND REUSE	City of Los Angeles Sanitation

Ms. Lau introduced the first speaker, Mr. Adam Krantz, President and CEO of the National Association of Clean Water Agencies. Mr. Krantz thanked the NIAC for inviting him. He said it was a very meaningful day to talk with the group given the anniversary of September 11th. He said it is hard to believe it has been 14 years, but it serves as a very important reference point in terms of the discussion they will be having. He thanked Mr. Baylis for helping to organize this presentation. He also thanked the NIAC for focusing on water. He said he feels it is often overlooked in terms of critical infrastructure despite the fact that every other sector deeply depends on water for their survival and capacity to thrive. He said he is really happy to see water being discussed. He said that he hopes his presentation will provide a framework for the presentation by Mr. Hagekhalil, which will follow.

Mr. Krantz began his briefing by explaining that the National Association of Clean Water Agencies (NACWA) is a 501©(6) trade association. They are committed to advocacy, specifically in Washington DC with Congress and The Environmental Protection Agency (EPA). They represent about 300 publicly owned treatment plants, including Los Angeles Sanitation. Many of them have joint responsibilities with drinking water. He said he is aware that some members went on a tour of DC Water. DC Water is a member of NACWA, they do both water and wastewater. The populations NACWA works with are both small and large systems, serving a range of 1,700 people to 7.5 million people. NACWA serves the majority of the population of the US in terms of wastewater, drinking water and storm water management needs. Mr. Krantz started at NACWA about 15 years ago, in May 2001. Several months later, 9/11 happened. He was the Communications Manager at the time, not the CEO. It caused great fear that terrorists would come under cities through sewage tunnels and bomb from underneath, or find a way to poison people with chemicals in the drinking water. There was concern about chlorine gas tanker cars going through city centers. It was an important moment. Water played a central role as the scenes played out and people had time to think. Initially, resiliency at that point was seen as response to manmade threat. DHS was created and NACWA asked to serve DHS and EPA jointly to figure out what could be done to make sure the water and wastewater systems were secure from these types of threats. NACWA got involved in a number of ways. Chlorine gas was a big issue relative to how safely it could be transported, stored and used. Water, wastewater,

Mr. Krantz said he helped to write the National Infrastructure Protection Plan (NIPP). Everyone in the Water Sector and other sectors were trying to figure out what to do and make the sector safer. Part of that was the development of the Water Information Sharing and Analysis Center (W-ISAC). Even today there is still much communication through the ISACs and they are uncovering cyber security threats given the anniversary of 9/11 and water and wastewater treatment plants should be very careful in terms of their computer systems. Those issues continue to be seen today. Alarm systems were developed, as well as the water, wastewater agency response networks so if something catastrophic does happen, there is a network of utilities across the country that can come in and provide resources that may be necessary to solve the problem. Those have become very useful, more during Hurricanes Katrina and Sandy. The systems were based on manmade threats and have grown to be more relevant in the resilience setting. Cyber security continues to be a top concern for utilities. The administration is focusing on cyber security. Several utilities have experienced cyber security attacks. There is a framework for improving critical infrastructure on cyber security that was released in 2014. There is a Water Sector Coordinating Council (W-SCC) in place and the EPA helped in developing the strategy for implementing the framework for the Water Sector. The American Water Works Association (AWWA) has made a cyber security guidance tool. He said that more work is clearly needed in the cyber security arena.

He said they are now moving into a much broader definition of resilience related to climate. In the wake of 9/11, Hurricanes Katrina, Irene and Sandy have been the foci. He said generally speaking, climate has been changing dramatically for water, wastewater, and utility managers. The wet areas are becoming wetter, the dry areas drier. Utility managers have to figure out how to manage plants in those settings. Population expands, industry expands, and stressors on water quantity and quality is the defining challenge for the sector. Along with natural disasters, they are seeing indications of sea level rise, more frequent and heavier rainfall events across the country, compound impacts such as harmful algae blooms which were seen in Toledo and Lake Erie, which is a very scary concept because as the population expands so does the need for food. Our need for food expansion causes nutrients to be put into the waterways at unprecedented amounts. It is basically an unregulated matter. Unlike wastewater systems that are highly regulated, agriculture is not highly regulated. This is causing severe problems, especially when talking about wetter and drier areas. In drier areas the concentrations become more problematic in terms of bad stuff getting in the water. In wetter areas, they are more likely to runoff into the waterways causing other problems. This is a big problem in the West, in terms of sustainable water supplies. The population is now highly concentrated in coastal areas. It's currently 39.1% of the population, close to 125 million people and growing. People are moving away from typical cities to coastal areas and that is a pattern that will need to be dealt with in terms of resilience. There are also historical levels of sea-level rise being seen. He showed a chart that had

a rapid rate of increase from the 1930's until now and the pattern is continuing. In 2011, the algae bloom in Lake Erie was the worst ever. This is a [pattern they are seeing more frequently.

Along with wetter areas getting wetter, there is also an impact of the drier areas getting drier. This is not just a water supply issue. When dry areas get drier, all the water still has to go somewhere. When there is dry weather, the waste stream gets more concentrated. As it becomes more concentrated, it is harsher on pipes and the existing systems, becomes much more costly to treat it, and if you are unable to treat it, you are sending it back to waterways that may not be as diluted as it was previously. So it is going to be receiving water that may also be more concentrated. He said this is a scary trend they are going to see that will cost an enormous amount of money to deal with, let alone trying to convert that water into reusable water, if not ultimately potable water, which many in the West are trying to do. He said all of the resilience water management issues are happening in a context where they are already facing a 1-2 trillion dollar infrastructure funding gap. All of the estimates from EPA, the Administration, and DHS do not take into account resilience climate issues. These are pipes that need to be rebuilt and replaced. In a study with the Association of Metropolitan Water Agencies, they found another trillion dollars was needed to deal with the resilience issue in water management. Katrina, Sandy, etc. have shown what happens when there is not capacity to treat waste. There is massive washout that organizations like the Federal Emergency Management Agency (FEMA) are still trying to deal with in those areas.

Lastly, he said water is critical across all other sectors. He said in certain aspects it is more important than other sectors. Across all 16 critical infrastructure sectors, 75% depend on external water for operations and 68% depend on external wastewater discharge service operations. There would be a total shutdown of the manufacturing of energy without a steady water supply. Utility members are providing a system where things can grow and continue to grow. It has gotten to a point where society expects those services, but it cannot be done anymore. It is a huge paradigm shift for the country. The water sector plays a center cornerstone. He said climate resilience needs, separate and apart from existing infrastructure needs are over one trillion dollars, which is a modest estimate. There was a water resilience summit where Gina McCarthy, the head of EPA spoke to the group, which included private and public sector leaders from every water management agency. Across the board, every sector said they needed more funding. He said EPA has about six pages of tools that they have created to assess climate and resilience needs, aid in resilience planning, vulnerability self-assessment, etc. He said they are all very helpful, but they are not addressing the need. All of that need is on municipalities. He said they need to develop a way that Federal agencies can help utilities and local governments broach that gap. All of the environmental statutes today were written 50 years ago and they were very helpful and critical statutes without which Mr. Krantz would not be in the position to talk to the NIAC today. They created a safe and secure water supply system and wastewater treatment system. However, there is no mention of climate, resilience, rural utilities, clean energy or security related issues. These statutes deal with very distinct technical treatment requirements. He feels these statutes remain stuck in the 20th century and it is necessary to think about how they can be brought into the 21st century so utilities can prioritize the funding they are getting from their rate payers to do things that ensure their sustainability for the next decades. In order to do that, a strong local, state and Federal partnership is needed, which is what the NIAC is

doing. He applauded the NIAC for looking into water and wastewater issues as a core infrastructure need. He said that NACWA and its utility members are willing to assist and thanked the NIAC for having him. He then introduced Mr. Adel Hagekhalil.

Mr. Hagekhalil thanked the NIAC for asking them to come and share their experience. He said he thinks water is taken for granted. For many years, water was outside of people's minds and the only time it was acknowledged was when something went wrong. He said they can no longer afford to function in that way. He asked the Council to imagine a day without water and access to wastewater. Not being able to flush the toilet would have a very personal impact. He then asked them to imagine an entire city not being able to flush sewage, it would be a huge environmental disaster that people do not think about. He said it could take years to recover. Therefore, they need to plan for it and it cannot be done overnight. Investment in aging infrastructure has to be done. He said they need the flexibility to do this in an innovative and creative way which would give multiple benefits. He said people think of resiliency as protection from man-made threats, but natural disasters also need to be taken into account. In addition, lack of investment is a threat, he said "we can be our enemy to our infrastructure resiliency". He said being able to prevent a disaster from happening, or minimizing its impact and being able to respond to it and recover quickly is how he sees resilience. He said he takes the responsibility very seriously, but he cannot do it all. Private businesses need to partner with Federal, state and local utilities. Residents have to come together because it costs money, it takes people and innovation and ideas to change things, and the commitment to move forward. He said he would next share an example of LA because water is so important to their economy, life, and growth as a society, city, region, state, country and world. He said that is taken for granted and he applauds NIAC for looking at water because water is essential.

In LA, they are looking at their dependence on water. They are having the worst drought in history. But there is also El Nino, which is the worst rain event in the history of LA. He said his focus is on preparation. He said they cannot be resilient just by telling owners they have to prepare, they have to implement. They have been doing that with water and wastewater resources. He referenced Mr. Krantz's statement on cyber security and control systems. He said in the entire wastewater program, they are putting in $100 million to invest in state of the art facilities to manage their operational complex. He said they can now completely move locations and continue to operate and serve the system if something goes wrong. This was something that was never thought of before. Now they are thinking of how they can continue to operate 24/7 no matter happens. That is a very big change. He said currently they are preparing for El Nino. They have a plan and they are looking at their facilities. They are working with the community and their partners to prepare a response to flooding. He said if they do not prepare now for the future, they will never be able to become resilient. He said investment, innovation and collaboration are necessary.

He said next he would discuss water challenges. He informed the NIAC that LA's water consumption today is the same as it was 40 years ago, even with 1.5 million more people. They expect the population to continue to grow, especially along the coast and in large cities. He said they have aging infrastructure, many regulations and limited funding. Over 85% of the water in LA comes from somewhere else. When water is coming from somewhere else, it depends on

some transportation, which also has to be resilient. If that is cut, they have to address whether or not they could survive. Climate change, sea level rise and drier weather are all issues. There have also been a lot of fires. After fires, the rain creates mudslides. He said he has experienced fires followed by flash floods and cloud bursts, which they have not seen before at this time of year. The weather is changing. He said in 2012 he was down by the port and there was a high tide in the harbor and the most intense rain. It was a "hundred year storm". The storm was sealed by the high tide and the entire community was flooded. The community was very angry about it, but was assured that this was a "hundred year storm". The next day the same thing happened again. Things like this have to be planned for and addressed. He said they try to partner with FEMA to work something out. He said he is glad FEMA also provides preventive funding instead of just reactive funding. He said in the USA, people should not have to be pulled out of their flooded homes by the fire department.

In terms of solutions, he discussed LA's *One Water* plan. For many years they planned in silos. He said in order to serve the community better, there needs to be information sharing. They can get more out of their investment if they do things collaboratively. He said for example there is an area in the San Fernando Valley that is prone to flood but also has an aquifer underneath it. It is the most productive aquifer for LA. To address this problem they installed a 40-50 acre gravel pit. Instead of it flooding every time it rains, they are able to capture runoff from 1000 acres, treat it and put it into the ground to recharge the aquifer. The outcome is the community is not flooding and water is being replenished for the local water supply, clean water will improve quality of life for other places, and residents are able to prepare for the future. These are things that they are building. They estimate that for $1 of investment there is a $20 return on investment, because of what it costs and things they will not have to do such as flood control, treatment systems or buying water from outside the region.

He said in LA when they refer to water, they are referring to drinking water, wastewater and storm water. Those are the three components. LA has one of the largest systems in the country. They have 6,700 miles of sewers in a 460 square mile area. Each day 350 million gallons of wastewater is captured and treated. He said one of their biggest priorities is updating their treatment plant to treat water every day as well as creating water that can be used as recycled water, clean water for ground water augmentation. These are ideas that are being discussed to address many of the challenges they are facing. However, this treatment is in a flood zone so they are working with the Army Corp of Engineers to ensure the facility's protection in a rain event.

Mr. Hagekhalil next gave an example of a plant in San Pedro. He said they are installing state of the art treatment to purify rain water for replenishing the barrier for sea water intrusion. This is crucial for industries. Instead of using potable water they are using this water in their effort to offset and move forward. He also gave an example of a treatment plant which is located near LAX airport. That is an area where they are looking at how they can better use the water. If water gets too close to the ocean, it is too far. It cannot be treated and distributed because it is too caustic. However, it may be able to be used somewhere else in the system. They could also do a partnership with someone else in the area to do some water trading. He said these are all great ideas. He next explained that the digesters allow everything to be used. The biosalts are being

digested to create methane. Methane creates energy and energy runs the plant. This makes the plant self-sufficient and independent from the outside. Many of their water treatment plants are trying to become independent from an energy point of view, and they are actually generating their own power and reusing it to treat water. This is also a security threat because there is a lot of methane involved. They have done a lot of security protection, including investing $100 million in the control system to ensure they have the highest level of security and ability to protect their system.

In addition to using the biosalts to generate natural energy, they take them to a farm in Kern County where they create animal feed. The feed is used to feed the animals at the LA Zoo. It is a great partnership, "the circle of life". The water goes down the sewer system, it is captured, they create energy in the form of fertilizer, take it to the farm, the animals eat it and they create more waste. It is very sustainable. The wastewater system is a collection system. Collection systems are a huge investment. They have sewers in every area of the city, if one is not working, it has a big impact on the homes and the community.

He said at Venice Beach, sewage comes through a pump station and gets pumped into a treatment plant. There is one connection from the pump station to the treatment plant. It goes under the beach. They are working on finding a solution, because for resiliency and security, they cannot afford to have a single pipe serving that community. If something happened along the beach, manmade, natural, or structural, it would be because they have not been able to inspect that enforcement in 50 years. They are currently investing $70 million to build another line away from it. They have created a distance to create redundancy. He said it took a long time to convince the community to build away from it and not next to it. The community wanted it at the beach, but he had to convince the stakeholders that the best solution would be to put it elsewhere. They are thinking about it and the utilities are thinking about it. They are thinking about resiliency and redundancy. He said imagine the enforcement failing. There would be 10 million gallons per day of sewage going into Santa Monica Bay. He said this keeps him up at night.

Storm water and flooding is a huge issue, but they are trying to take the problem of flooding and turn it into a solution of water supply. They are doing this by capturing water off streets. He said people are talking about cisterns, rain bells, the gravel pit etc. All of these things are being done, but they estimate they will need $8 billion for the next 15 years to manage the runoff in LA. They are not managing it just to address flooding, but also water quality. It is important to look at flexibility in regulations. Just meeting the water quality standards would probably mean one would have to invest in things that are not providing multi-benefits. Putting in green infrastructure that can capture runoff and hold water gives a lot more flexibility and benefits to the community. He said they are seeing that with the new regulations and the flexibility to build things in lieu of just purely meeting a number. They can come up with a solution with multi-benefits, they need to be smart with how they do things. In many communities there are separate storm drain systems. On the East Coast, many communities have a combined sewer system. That is a huge issue because if there is flooding, there is sewage and water coming through. He said in DC it is almost 50/50 with some systems combined and others not. In LA, there are still a few combined, but mainly it is separate. However there are still challenges. In LA, every time half an

inch of rain falls, over 3.5 billion gallons of water washes into the ocean. That creates flooding conditions, but it also could have been a resource if it were captured. Flooding can help them become resilient when it comes to water supply. They have a huge vision right now. Water knows no boundaries. Many cities are not based on watersheds. They are planning to use a watershed approach, because to address water it needs to be discussed in a watershed context. They are doing a plan through their watersheds. They have four watersheds in the LA region that they are managing with their partners to address water through a multi-benefit process.

Next he showed the Council some pictures of private industry development doing things to manage runoff onsite. This is a requirement for a permit now, they have to capture runoff and re-use it or infiltrate, and that has been applied across the entire development including streets and sidewalks. He then showed a picture of the gravel pit he earlier described. He said they are looking forward to finishing this project and perhaps make use of NIAC's report. Next he showed a project in the Pasadena area depicting major run off and flooding. The community was complaining about the condition of the park. To address this, they built a living element cistern and infiltration gallery under the park that captures water for 40 acres, prevents flooding, and the water is sent to communities downstream, which allows the community to get a park they can enjoy. Next he described a project close to the ocean where they had a huge issue with bacteria in the bays. The project allowed them to improve quality as life as well as tourism. Next he showed a $3.5 million cistern that they built and are working with partners to figure out how that water can be used for irrigation, including golf courses. They invest in flooding, captured storm water, and improved water quality. In addition they have 3.75 million gallons of water available if something goes wrong. It can be treated and used for drinking, essential usage, etc. Having decentralized systems across their communities make that more resilient. Most of the water in LA comes from somewhere else. They have three sources of water, the Colorado River, the LA aqueduct and the state project. However, their goal and commitment is to continue to diversify.

Mr. Hagekhalil said LA Mayor Eric Garcetti has established an aggressive plan. He hired the first chief sustainability officer and chief resiliency office. They have the first sustainability plan. They have an innovative emergency management system and a state of the art emergency response center. Those are activated for emergencies and they coordinate across departments to respond to emergencies, as well as prepare for emergencies.

Next Mr. Hagekhalil showed a picture of a snowpack and described the impact of dry weather as well as the sea level rising in the ocean. When there is a high tide combined with rain, a lot of things can go wrong. He said the integrated approach of *One Water* goes beyond the drought. In his view, *One Water* is the answer to resiliency and sustainability, but they cannot do it alone. It needs collaboration and partnership. Next he showed a chart of LA's water consumption, which is the same as it was 40 years ago, despite over 1.5 million more people. He said in the past water conservation efforts have been only inside the homes, but now they are going outside. They are giving rebates for removal of turf. There is a rebate of $3.75 per square foot of turf. This has allowed businesses such as "Turf Terminators" to grow from 4 employees to 400. They have customers sign off on the rebate and they remove it for you and it has created a whole new industry. He said water creates jobs. Green infrastructure and green jobs are a new priority. They are opening an academy and partnering with organizations with training tools, especially for

disadvantaged communities. The community takes care of these projects because they are trained, contracted and addressing these issues.

October 14, 2015 is the one year anniversary of the mayor's directive on water sustainability. Mr. Hagekhalil said it is a great goal that the mayor set. There are some important and aggressive goals they are working towards such as reducing imported water by 50% by 2024. This is a bold goal. They are moving forward and are very excited about the challenge. They are first working towards reducing their consumption per capita by 20%. He said that makes them resilient. They have local water supply and they are capturing water, putting it in the ground, making it accessible, etc. He said one idea he and Mr. Baylis had was to put in inflatable dams to store some water. If six dams were installed, they could store 2.5 billion gallons of water. In a disaster, having 2.5 billion gallons of water could keep LA alive for days. In order to be resilient, they have to be able to survive independently for days, which is something they are always thinking about. It would be a good thing for sustainability and resiliency. He said his view is that sustainability and resiliency are coming together in a number of ways. This is the future they are looking at, the goal of diversifying their portfolio and making it more local.

Next he showed a slide of solutions for water resiliency. It has three parts: recycled water, storm water capture and water conservation. Ground water is another resource they are using. All of this is critical and requires investment in treatment plants to make sure water is running all the time. Power is essential, as well as making sure there are alternate sources of power. The wastewater system has pump stations in all areas. They always have a generator ready to run if there is a power failure. He said resiliency is always being able to run no matter what happens. He recalled being part of the city effort to address Y2K and they went through an analysis to make sure that generators would be able to run all the time.

Currently the city is developing its 2040 *One Water* plan. He said he is looking forward to collaboration on this effort. He concluded by saying water is essential to the economy, life and communities. Again he asked the Council to imagine a day without water, as well as a day with too much water, or a day with polluted water. None of these things can be allowed. They prevent it through planning, investment, preparedness and collaboration. He said everyone has to come together. Sometimes water is considered "out of sight, out of mind", but he feels they have responsibility as utilities and he hopes that with the NIAC report, it will be in sight and in mind. This portion of infrastructure is so essential to growth and life, because no one wants to wake up in the morning, turn the faucet and not have water. He said he sees the future of the USA is to make sure they have enough safe water for generations to come. He said the great thing about the USA is it is innovative and resilient. He looks forward to the NIAC's effort and what they come up with and offered his support. He said he looks forward to seeing the NIAC in the future, hopefully in LA.

Ms. Lau thanked Mr. Hagekhalil for his comments. She also informed the Council that he has offered to host the NIAC in LA for the quarterly business meeting in June 2016. Mr. Hagekhalil said that if the Council comes, the meeting could be held at the Environmental Learning Center. Ms. Lau then requested that they move to the questions and comments part of the agenda.

VI. PUBLIC COMMENT: TOPICS LIMITED TO AGENDA TOPICS AND PREVIOUSLY ISSUED NATIONAL INFRASTRUCTURE ADVISORY COUNCIL STUDIES — *Ginger Norris,* ADFO, NIAC, DHS

Ms. Norris said they are now going to open the floor for questions and comments from the public. She explained questions must be relevant to the NIAC's responsibilities and reports that have been written in the past. Once the comments have been completed, Ms. Norris said the Chair has asked for the members to be able to ask questions. Based on the list of registered speaker, Ms. Norris called Mr. Paul Stockton to make his comments.

Mr. Stockton said that the NIAC had produced an excellent regional resilience study, which indicated that a number of water and wastewater companies in the New York and New Jersey region are on the brink of failure for a medium duration power outage. There are scenarios that could produce a much longer outage duration, potentially over multiple FEMA regions. He said he was hoping that the NIAC might address what types of strategies make sense in anticipation of genuinely long duration, wide area power outages from either natural disasters or a manmade event.

Ms. Norris thanked Mr. Stockton and informed him the comments would be posted on the NIAC website. She then asked Ms. Lau if she had any questions or comments for Mr. Stockton. Ms. Lau said she would like to open the floor to Council members to ask questions of Mr. Stockton, as well as the presenters, Mr. Krantz and Mr. Hagekhalil. Mr. Stockton clarified that he was previously an Assistant Secretary of Defense for Homeland Defense and that he takes deep interest in all the infrastructure represented here. Ms. Lau thanked Mr. Stockton.

General Edmonds commented that he had taken some notes on the water presentations and one thing that occurred to him was continuity of operations. He said it is not something people think about, but he is glad to learn that they do in California. He would like the message to get around to building water works. He said energy and electricity is important, but so is continuity of operation. In addition he thinks the term "preventative funding" is a good term for the NIAC to pick up on. He referenced Mr. Stockton's comment on strategy for long term outages and preventative funding is a critical way to look at it. Next General Edmonds referenced *One Water* and said he felt it would be very important for the NIAC to address the economic impact on industrial water. Water is needed to run nuclear power plants. If it is not available, there is a big problem. Additionally, in California, more agriculture is needed because "everyone is eating from the bread basket". He agreed that flexibility of regulations and reuse are very important. He then asked Mr. Hagekhalil what was the one thing LA has done in the past 18 months that he thinks could be passed on to other cities or regions to help them with water resilience. Mr. Hagekhalil said there were a number of items. He said that bolstering cyber security is very important. LA made the commitment to revamp the control system to ensure it was resilient in the 21st century and to prevent cyber-attacks. They are working on being able to control their

system from different locations so they can run the facility without being there in the case of an evacuation. That gives a flexibility and resiliency that was never possible previously.

The other thing Mr. Hagekhalil is proud of is the idea of green infrastructure and multi-benefit projects, which is now common language. People ask for these things now and want to see it and when they talk about managing water, if they do it in a way with multiple benefits, (floods protection, reserve) it changes the dialogue and paradigm. He said he is proud of that. He said the good thing about drought is that it made them think twice and now they have political support to be creative, innovative, and prepared for what needs to be done. There is a campaign called "Imagine a Day without Water", in which utilities, business and the community come together to heighten awareness of water. For example, they do not know how much water they will need for fire protection and LA has many brush fires. Imagine a day there is not water to fight fires. The *One Water* discussion, the innovative planning, the infrastructure, the control system and thinking ahead will allow them to invest the money in computers, control and security. General Edmonds thanked Mr. Hagekhalil.

Dr. Scott said that these presentations have been great. She asked Mr. Hagekhalil and Mr. Krantz about the flexibility of regulations with specifics on the focus on the national level and where they would specifically like the NIAC to look and focus their efforts. In addition, she said it was great to hear about best practices and what has worked. In terms of incentivizing partnerships, she said that will be so critical because there is not "one big pot" for this. She is also interested in how they are addressing the cross-sector interconnectedness and coordination in terms of how they move as a sector. She said she was very interested in the communications piece of how they change the lack of investment in infrastructure. She feels they are doing some great things on the localization end in terms of work force and local business involvement. She is very impressed with the work LA has done in terms of leading the charge. She believes that the messaging that helps to get to people related to infrastructure investment when the multiplier effect can be shown. Lastly, she expressed her excitement for NIAC to study water.

Ms. Durkovich said she would also like to thank the presenters for the wonderful and very informative presentations. She then asked a question related to investment needs. She referenced the statistics they have given about $1 investment with $20 return as well as the staggering number of $1 trillion just for climate resilient structure. Given that there is political will and public support, she asked where they are finding the money to do some of these initiatives and what private-public partnerships are involved.

Mr. Krantz said the place to start is looking at how much money is spent by the local municipalities. He said he would give Ms. Durkovich a few statistics. $100 billion dollars per year was invested by the municipalities for both drinking water and waste water. It was split pretty evenly with about $50 billion per year each. That is the total municipal spending. Currently, Federal spending is limited largely to the state loan fund investment that the Administration makes which is deeply appreciated. It has actually grown since the stimulus bill in subsequent years. That is about $2 billion per year in loans to communities. They are looking at a local investment of $100 billion and a Federal investment of a couple billion. That is separate from events where FEMA comes in. This is just the annual appropriation amount. That

is the picture. States are involved in a very minimal way, perhaps with issuing bonds. The question is, "where is the money going to come from?" There is a $100 billion gap per year in spending and $1 trillion need over the next 10-20 years. That is a big gap. It is an Environmental Protection Agency (EPA) identified gap under the Bush Administration. It goes back a ways, and it was at the front of the political aspect. They did not want to see the gap.

He said public-private partnerships are very useful. About 99% of wastewater treatment facilities are held in public hands. Many things are meant in the context of public-private partnership. They keep hearing about the $2 billion that is sitting on the shelf that private investors have that they would like to see in the public infrastructure sector. They have been doing this for about 20 years. There are very interesting ways to partner with private firms. DC Water just did a century bond which was outside the tax bond realm. It allowed private investment into DC Water. With that said, they are not seeing private entities taking over clean water, wastewater or drinking water in any major way, except for circumstances that are financially distressed. What they are seeing is when they are trying to become more sustainable through interesting projects where there is a revenue source at the end of it, such as creating green infrastructure, and there is a way to bring in revenue through that system, or creating energy that the municipality is willing to pay for, there is a project that may be able to be funded through private investment and private capital, and ultimately some revenue is achieved at the end of the project. They are holding out a lot of hope for public-private partnerships. It is a little different than it is in other infrastructure sectors. Water creates an emotional quality that is not fully demonetized. He said that the public might spend $50 million per year on drinking water, but $25 million per year is spent on bottled water in the U.S. All of the water usage that is being paid for everywhere is only double the amount of revenue that private companies are getting. Programs that ask people to imagine a day without water communicate a true value for water. Currently rate increases go up double the rate of inflation every year in wastewater services, and the annual rate for homes is about $500. Drinking water then gets added to that at about the same rate. Water services are about $1000/year now and it is starting to be noticed. People are asking why they are spending this much on water, but the arguments are starting to subside because in order to keep up they have to charge these rates to keep everything resilient and sustainable. His view is the municipalities carry almost the entire burden, and the way that they go about raising their rates additionally is to do so through a cost share incentive with the state and Federal government. That would mean the state and Federal government has to come up with real money and not look to public-private partnerships as a core solution, but come up with real funding so that the municipalities can look at their communities and say "if we want to access that funding, we have to share". These rate increases cost additional money but it ensures the water supply and wastewater system are top notch in terms of sustainability.

Mr. Hagekhalil said most of the money comes from local residents and it is becoming difficult for them to afford more, especially in areas like Los Angeles. The average household income is high, but there are communities with very low household income which needs to be taken into account. He said they are not pushing on many areas. There are things that are good to have that have a benefit. Instead of investing billions in something, that money can be taken and put somewhere else to provide a lot more benefit and resiliency. He said that is a possibility he keeps bringing up. He said they gave tax benefits to homeowners for energy, and suggested they also

do water. He suggested incentivizing people to invest in managing water on their own, capturing it on site and doing things with it by giving them a tax credit. He said he thinks they can change how they do a lot of things to help people and benefit the community. He said he hoped the NIAC will come up with some ideas in their report.

Mr. Krantz said his members are pushing them in a direction that he has not seen previously. Funding is a core interest of his association. However, the members are starting to ask questions. For example the Lockheed Energy Assistance Program brings in about $4 million per year for low income people to make sure they have heat. The question has become what the Federal government can do to help and why they cannot do something similar. The reason is the low income rates that the members charge, when there are state constitutional requirements that do not allow them to charge different rates, they have to charge one rate. He said if the Federal government could come in and help deal with the subsidies programming and the low income portion of their obligations, which will allow them to raise rates for those who can afford it and may be willing to pay more. This would be a much more functional solution. The problem is they do not have the wherewithal to change a State constitutional requirement. There are some states that do not have that, and to stay in those states valuable rates are starting to be charged, and people are being left out of the rate structure. People who are on Social Security might get treated differently as a separate class from everyone else. That type of program is targeted to free the utility up to charge higher rates because they do not have to worry about the lowest percent of the population which would be very helpful.

Mr. Hagekhalil said that in terms of partnership funding, if private funding comes in, they pay it back. Someone has to pay, it is not free money. The reason they can keep costs low is through bonds. If they take some of this tax exemption away it may make the private funding equal, but it would create harm to the community and the rate payer will pay, and less will be done with the amount. It is something to watch for and keep in mind.

Mr. Murren asked what percentage of water usage in LA is residential. Mr. Hagekhalil said it was 60%. Mr. Murren said it was a leading question because he completely agrees with both presenters. However, he said educating and changing residential and consumer behavior is a challenge as the majority of the water being consumed is out of the residence in his home state of Nevada. He said there are a number of ways to do that. One is rebates such as the “Turf Terminators”. Las Vegas also does that. There are also rebates in terms of funding. The plumbing fixtures that are in most homes are very inefficient and wasteful. New homes are now being built with water smart funding which in many cases is difficult to believe. Incentivizing builders and homeowners to be more thoughtful in their plumbing and landscaping would be a great effort. Education and outreach is very critical for the sector. It is the key in trying to motivate behavior. From a standpoint of wetlands, it is very critical. It is a natural filter for water. There is an environmental aspect to this that he feels needs to be addressed in terms of water quality and security. He said that he would love to learn more about using waste material for energy. Water can be a great source of energy, through the generation of power.

Ms. Lau then asked Mr. Hagekhalil to elaborate on the collaborations that he has found to be the most valuable. Mr. Hagekhalil said it is about the local and regional level. They have

collaborated between the agencies within the city. Waste water, storm water, transportation, all have to break the silos and collaborate, which is a great thing. Then they open the door to the community, local businesses, philanthropists, etc. want to be part of the effort because everyone wants to feel that this is their program, idea and commitment. Water is a member of the Chamber of Commerce since they are a business. They partner with everyone in the business community. If he does not do his job and give them water and take away wastewater, the business cannot function. They are now seen not only as a partner, but also a business because they employ people. In addition they have to talk to the watershed because they cannot function and manage water independently of neighbors in the watershed. Then it is open to the region, state, and country as wholes. Collaboration is essential to reach common ground and share ideas. He thinks that private businesses will do great in trying to open dialogue. He said they are going to a private water summit in Denver where they will have a public-private partnership discussion. There are a lot of ideas and innovation across the country such as bio-cells being converted to methane and energy being used in the grid. In Providence, RI there are wind turbines to create energy for treatment plants. In Chicago, they are generating a type of algae that can be converted into energy. He said collaboration has multiple things but what he keeps saying is that they need to make the tent bigger and have more people under the tent. His tent is the *One Water* tent.

Mr. Krantz said from a national perspective, they are working with the EPA, the U.S. Department of Agriculture, and the Department of Transportation, which have entered into a memorandum of understanding to make sure their respective programs take water impacts into account. Highways systems across the country have a huge impact on water quality and runoff. The agriculture side is becoming very aware that they may not be able to stay out of the regulatory regime forever in terms of nutrient loadings so they want to be at the table. These very new discussions have started to take place. EPA is at the center of it, bringing in all the other interests. They are starting to see small changes in legislation given this collaboration with associations that represent some interests of each sector (agricultural, for example). They are coming together and seeing small changes that govern each other's lives. The Farm Bill for the first time specifically addressed partnerships between wastewater treatment plants and agricultural interests. They get together and do projects that can benefit nutrients. For example, they signed with milk producers to buy digestives for energy issues so they have accomplished two things. The first is the creation of energy; the other is a much more effective way of managing nutrients. As they deal with the majority of the burden of pelletized product, it can be used anywhere, it does not have to be in the U.S, it can be an international product. They are starting to see many really interesting partnerships take place. It is beginning to be discussed at the Federal level, but much more work needs to be done. Ms. Lau asked if the memorandum of understanding (MOU) was with NACWA. He said that they are only used with NACWA. He said they also have another one with Docks Unlimited to get to the wetlands point where members have the money to help to create those acres. They try to find mutual interests that have not been thought of in the past. The members have the capacity to spend some money and do the right thing. If they can make the case for multiple benefit projects it is easier. They are seeing these things happen, but they are not necessarily everywhere. Ms. Lau asked if they are working with any of the other Sector Coordinating Councils (SCCs). He said at this time NACWA is only working with the Water Sector Coordinating Council (W-SCC). At that granular infrastructure level, they have not been invited to other sector discussions. Ms. Lau said she was curious

because when he talked about energy from the digesters as opposed to energy from the Electricity Sector. Mr. Krantz said that is true, that they are seeing their members co-locating with energy producers and nuclear energy producers. For example in Miami they are no longer allowed to discharge into the ocean. They are seeing a lot of innovative, creative and helpful public-private partnerships right now. However, they do not address the infrastructure resilience funding gap. They are very helpful in saving money and sometimes bring in revenue to the utility.

At this point, Ms. Lau requested that the meeting move on to Working Group presentation and turned the meeting over to Mr. Baylis.

VII. WATER SECTOR RESILIENCE WORKING GROUP PRESENTATION: SCOPE, PROPOSED APPROACH, AND SCHEDULE

Jack Baylis, Working Group Chair

Mr. Baylis said they are very excited about the launch of a new study on security and resilience in the Water Sector. He thanked the members of the Working Group: General Edmonds and Ms. Grayson. He said they have already had teleconferences to move this study forward. Ms. Lau informed the Council Members that membership is still open for those who want to join the Working Group. Mr. Murren volunteered to join.

Mr. Baylis said he would start his presentation with the agenda, a background of Council studies leading up to this study, some of the basic information about the Water Sector and its resilience. He said he will also present the study charge which is very important because the Council will have to vote in order to push the study forward. They will also propose an approach and a schedule. They will be finishing the study by June 3, 2016. He acknowledged that is an ambitious schedule. Ms. Lau said it would allow the Council to go to Los Angeles for the summer Quarterly Business Meeting.

Mr. Baylis said the Water Security and Resilience Study follows four previous studies addressing critical infrastructure, including regional resilience and resilience in the Electricity and Transportation Sectors. Two of the lifeline sectors have been completed and the Water Sector is a logical next step. He said when they talk about water, it is important to understand that the business is disaggregated. The Water Sector has four general categories: water resources (surface water and ground water), water supply and treatment (agencies that take water from the resources, treat it and supply it to people and businesses), wastewater treatment, and storm water management. Each category has its own operational means, assets, risks, costs and unique approaches. It is important to understand each of the four categories. He said Mr. Hagekhalil talked about *One Water* as bringing the segments together, but in order to assess the risks, they need to be able to understand how a wastewater plant is different from a storm water facility.

The next slide is a complex graphic that describes how many interdependencies they have in the Water Sector. Power plants and the nuclear industry need water. Water and wastewater plants need power. They typically have backup generators, but those run on fuel and fuel can run out. The issues from a risk perspective are that when the backup generators run out of fuel there will be a concerned public that may already be without power for a few days, and all of a sudden the water is not coming down the faucet and they cannot flush the toilet. That can significantly exacerbate the problem. Another example is the chemicals that are needed. Some plants use chlorine gas and other dangerous elements. There is not a lot of knowledge at the Federal level of events that could happen. There needs to be awareness of what is going on at the plants.

On the West Coast there is significant drought, while on the East Coast there is a significant flood issue. He said in their examination of the Water Sector, it will be important to realize the different resources, assets and risks per region across the US. The charge for the study is to apply the NIAC recommended framework for establishing resilience goals developed in the 2010 study, to the Water Sector. In particular, the Council has been asked to test and validate the usefulness of that framework in another lifeline sector. In the transportation study, they had to slightly modify the framework. In addition they are charged with uncovering key resilience and security issues and identify potential opportunities to address them. In particular, they want to understand some of the key interdependencies between water and other sectors and how it affects national resilience and security. The framework was developed by Mr. Wallace in the study he led on the Electricity and Nuclear Sectors. The same approach will be used for the Water Sector. By using this framework model, they hope to accomplish three things: validate the framework; get the baseline of the current security and resilience practices in the Water Sector; and address the gaps and seams that may exist in existing water security and resilience and recommend steps to address them.

The study will be guided by a series of seven framing questions. The first three are current strategies and practices that promote resilience and security in the Water Sector, common practices for each region or subsector and cascading effects that result from interdependencies. They want to understand these three elements. They also want to understand the gaps and seams that exist in the Water Sector. They want to identify and understand the unique factors within the sector that influence risk mitigation. They want to understand the proper roles and responsibilities of the private sector compared to the government. They want to understand new policies and strategies that may be needed to improve security and resilience for the sector.

The Working Group will task a Study Group made up of non-NIAC members to conduct research, interview subject matter experts, and assess sector resilience using a high-impact event. The NIAC staff has asked Mr. Hagekhalil if he will chair the Study Group and he has agreed. The Study Group will leverage a variety of information.

The timeline is an ambitious schedule. The schedule is to have a final report by the June 3, 2016 quarterly business meeting. The next 4-5 months will be intensive. The next step is to refine the study approach and schedule, identify resources, develop additional questions and taskings for the Study Group and start conducting interviews and briefings to collect the data.

Mr. Baylis said he would like to thank Ms. Lau and the Council and see if there are any questions. Ms. Lau commented that they had already given a lot of input earlier, which was great. She asked if there were any additional comments now that Mr. Baylis has presented the scope document. There were no additional comments. Ms. Lau took a motion to approve the scope and charge to the Working Group. General Edmonds moved. Ms. Grayson seconded. Ms. Lau asked all in favor to say "aye". All said "aye". None were opposed. Ms. Lau informed Mr. Baylis that he has his charge and timeline.

VIII. CLOSING REMARKS

Constance H. Lau, NIAC Chair

Caitlin Durkovich, Assistant Secretary for Infrastructure Protection, DHS

Ms. Lau said they are now at the time for closing remarks and invited Ms. Durkovich to speak. Ms. Durkovich thanked Ms. Lau, Mr. Hagekhalil, Mr. Krantz, Mr. Baylis and the Working Group. She said this has been a very informative meeting. She is ecstatic about the focus on the Water Sector in this particular study. She commended the Council for continuing to look at security and resilience in the lifeline functions, as well as think about the increasing interdependent and interconnected nature of these systems. She thanked everyone for their great work. She said she is fully supportive of a meeting in Los Angeles. She said many sectors have done meetings around the country. Getting out of the "beltway" offers an opportunity to see what the critical infrastructure partners are doing. She again thanked everyone for their hard work and concluded by saying that today is a reminder of why they all gather on a regular basis. She is incredibly grateful for the commitment that the members have given to ensure the nation's infrastructure is secure and resilient. She said she knows the entire leadership of DHS and the country is grateful as well.

Ms. Lau said before she adjourned the meeting she wanted to call out Mr. Glenn Gerstell who was a former member of the NIAC. Between the last meeting and this one he has been appointed as General Counsel of the National Security Administration, therefor he has had to step down from the NIAC. Ms. Lau said that the Council wished him well and he has done a wonderful job on several of the Working Groups and was active in the studies that were published in the past year. She then asked if there was any more business to be brought before the Council. There were no further comments. Ms. Lau thanked the members again and adjourned the meeting.