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LETTER TO COMMISSION

TO: Mayor Matti H. Bower and Members of the City Commission

FROM: Jorge M. Gonzalez, City Manager

DATE: April 8, 2011

SUBJECT: **Wastewater Force Main Break – Harding Avenue and 71st Street**

On April 6, 2011 at approximately 10:30 AM Public Works Operations Division received notification of flooding and pavement displacement at the intersection of Harding Avenue and 71st Street. The responding Utility crew confirmed that a major transmission force main that carries wastewater from the North Beach area and three communities north of the City and one community west of the City had ruptured underground. Immediately, City crews began the process of isolating the break and securing the intersection to prevent further discharge of untreated wastewater to the City's storm water collection system, and to protect public safety, welfare and private property.

The break occurred on a seventy-four (74) year old section of cast iron pipe used to transfer wastewater from these northern communities to the County's treatment facility on Virginia Key. The communities affected included Bal Harbour, Surfside, Bay Harbor Islands and North Bay Village, as well as portions of North Beach north of 72nd Street.

The magnitude of the break was significant, causing extensive damage to the intersection. Traffic had to be re-routed through implementation of a certified Maintenance of Traffic Plan (MOT) and with the assistance of the Police Department. All regulatory agencies were notified of the pipe failure in a timely manner, and the Public Works Department established a command and control emergency response team and a single point of contact for regulatory issues and for coordination with the contributing municipalities so that the integrity of information provided regulators could be insured, and communication between the City and the four (4) contributing municipalities would be clear and concise. An estimated 160,000 gallons of untreated wastewater was discharged into Biscayne Bay before tributary flows in this complex collection system could be isolated and shut down.

The Public Works Department contracted with D Mancini and Sons, Incorporated (DMSI), a licensed underground utility contractor currently employed by the City for other public works projects, under an emergency declaration to expedite mobilization and repair efforts. The intersection affected by the force main break also contained water, storm water, electrical, telephone and gas utilities. Fortunately, none of the other utility lines were compromised by the break. To insure public health and safety, the Public Works Department initiated extensive area wide water sampling program to confirm the safety of the potable water system and rule out the possibility of cross contamination. At no time during the emergency was the water supply system of the city compromised, and franchise utility services (telephone, gas and electric) remained unaffected.

Public Works and DMSI crews worked throughout the night to repair the break, which was complicated by the age of the pipe and conflicts with a Florida Department of Transportation (FDOT) storm drain line. The location of the break was directly above a crossing with a 24 inch diameter storm drain line. The design of the force main had been altered during construction (in 1937) due to this conflict. Working conditions were difficult because of the number and location of other utilities relative to the break, and due to operational needs of the contributing communities. In order to insure that residents of all communities did not lose sewer service, the City coordinated with the

County and several private hauling firms to mobilize a fleet of eleven (11) tanker trucks which were used to pump down pump station wet wells at wastewater pump stations in the satellite communities. Wastewater was hauled to locations that allowed discharge into working portions of the collection system for conveyance to the County Treatment Facility on Virginia Key. The pipe repair had to be performed in a wet (un-dewatered) trench, as tidal ground water levels could not be completely controlled, and pumped wastewater from some of the satellite communities continued to inundate the break site. Temporary repairs to the pipe were completed by 4:00 PM on April 7, 2011, however during the process of bringing the collection system back on line, a 36 inch diameter isolation valve was found to be broken in a closed position, and a second break occurred on a 20 inch diameter force main in the 72nd Street Parking Lot. Both the damaged valve and the second main break were part of the same 74 year old underground infrastructure system.

For a second night in a row, Public Works and DMSI crews worked through the night to rebuild the failed isolation valve in place, and repair the second force main break. The isolation valve was re-opened by 4:00 AM on Friday April 8th, and permanent repairs to the 20 inch diameter force main were completed by 5:00 AM. Our second attempt to place the repaired collection system into service was successful and as of 10:00 AM on April 8th, normal operations in all communities with the exception of North Bay Village were restored. North Bay Village determined that they have a ruptured wastewater force main at a subaqueous crossing. North Bay Village will be making repairs to their system over the course of the day Friday (April 8th) and they anticipate a return to normal operations shortly thereafter.

The repairs to the ruptured force main are temporary because special fittings are required to restore the damaged pipe to its original design condition. These fittings are special order (no longer manufactured). Therefore, the Public Works Department is in the process of evaluating cost effective alternatives to restoration of the line, which includes the options to bypass the damaged section of force main using directional drilling, line stops and wet taps or redesigning the original force main alignment to deflect the line under the existing FDOT storm drain that is in the way. Final repairs to the force main will take three (3) to four (4) weeks to design, permit and construct. In the interim, traffic flow will be restored through the intersection by restoration of the pavement where possible, and the use of steel plating over the repair location (to facilitate easy access when the permanent repairs are made). The intersection east to west flow of traffic was reopened on Friday, April 8 before rush hour and the north – south flow of traffic is anticipated to be restored by 8:00PM.

The City owns and maintains an ocean outfall line at 74th Street that is permitted to accept raw wastewater for ocean discharge. The outfall may only be used in the case of emergencies and prior permission must be obtained from the Florida Department of Environmental Protection (FDEP) and DERM on a case by case basis. The City is required to develop an event specific discharge plan certified by a Florida registered professional engineer, which includes a disinfection plan to partially treat any wastewater prior to discharge to the ocean. The ocean outfall is a disposal method of last resort. Had it been necessary to discharge raw wastewater through the outfall, it likely would have resulted in the closing of many public beaches along the South Florida coastline for days or even weeks. The resulting impact on the aquatic environment and the economic impact of closing beaches make this disposal option highly undesirable. The spill management plan developed by the City for this incident included a provision to execute ocean discharge of wastewater. Fortunately, through the effective management of the situation and use of tanker trucks to haul wastewater, the City did not need to activate the emergency discharge plan.

In summary, a catastrophic failure of the City's 36 inch diameter force main occurred on April 6, 2011 at the intersection of Harding Avenue and 71st Street at approximately 10:30 AM. The City effectively and efficiently developed a spill management plan and repair plan approved by the regulatory authorities that are charged with such oversight. Through the combined efforts of City and contracted forces the damaged wastewater force main and subsequent damage to the City's wastewater collection system was repaired and the system was placed back in service by 10:00 AM

on Friday April 8, 2011. The City complied with all rules, laws and regulations governing this type of incident.

The cause of the pipe failure has yet to be determined; however the damaged pipe section was recovered and will be shipped to an engineering materials laboratory for forensic analysis. The information gained by this analysis will be incorporated into the City's Capital Improvement Program governing infrastructure replacement and renewal in an attempt to predict and proactively address potential weaknesses in the City's wastewater collection system. The City had already engaged our Consulting Civil Engineers, CDM with the task of performing a condition assessment of wastewater force mains throughout the service area. The lessons learned from this event will assist in this endeavor which will drive recommendations on future capital improvement priorities. Another lesson learned involves our relationship with our satellite communities. The present collection system configuration does not allow Public Works Operations to monitor via remote sensors the operations of each contributing satellite communities' wastewater flow. We will seek to have supervisory control systems installed in satellite community lift stations that will allow us to monitor individual flows from our Utilities Control Room.

The City recognizes and appreciates the close cooperation we received from the four communities served by this portion of our collection system. Through the collective efforts of City staff regulatory authorities, and the close cooperation of contributory communities, a potential major negative environmental situation was averted, and a major wastewater transmission force main was repaired and returned to service in a timely manner. Costs for this operation have yet to be determined, but the Commission will be apprised as soon as all costs are compiled and confirmed.

DRB/FHB/HDC

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