

Agenda Item: 13.

MEMORANDUM

TO: Programs, Projects and Operations Subcommittee

FROM: Zach Nelson, Project Manager

SUBJECT: Review and recommendation on the Pigeon Creek Levee Emergency Repair

DATE: July 3, 2014

During the month of June, Dakota County experienced a tremendous amount of rainfall. On June 15, 2014 a high water event caused the Pigeon Creek Levee to overtop in various locations and breach in a location $\frac{3}{4}$ of a mile downstream of the South Bluff Road Bridge on the left bank. Over the following days, repair work was performed. On June 30, 2014 a breach occurred in the same location as previously in the month. Attached is a detailed summary of the description of events. Emergency repair work is estimated to total between \$50,000 and \$100,000.

Staff recommends that the subcommittee recommends to the Board that the General Manager be authorized to use the Informal Competitive Bidding procedures provided by District Policy 15.6.B for the acquisition of the emergency services of engineers, contractors and vendors of other property or services, as the General Manager determines necessary, to repair the Pigeon Creek Levee breach that occurred in the Elk/Pigeon Creek Improvement Area in Dakota County and take necessary steps to effect those repairs.

MEMORANDUM

TO: Board of Directors

FROM: Zach Nelson, Project Manager

SUBJECT: Review and recommendation on the Pigeon/Jones Creek Levee Repair

DATE: July 3, 2014

At approximately 9:30 am Sunday morning on June 15, 2014, PMRNRD Field Representative Lowell Roeber inspected the Pigeon Creek Levee and identified a breach $\frac{3}{4}$ of a mile downstream of the South Bluff Road Bridge on the left bank (north side) of the creek. (*see attached map*) The breach hole was approximately 50 feet wide and left a bench roughly three feet above the creek's normal water level. (*see pictures 1-5*) Throughout Saturday night and Sunday morning the surrounding watershed received over 5 inches of rainfall. The fields directly north of the breach were flooded. In addition to the levee breach there were numerous areas along the right bank (south side) of the levee where water overtopped the structure "as designed" and flowed into District owned land to the south of the levee. (*see picture 6*) The District purchased the land directly south of the levee for the offline water storage area and "wetland mitigation bank" in 2012. The high water event also caused trees and debris to pile up at the 200th Street Bridge over the Pigeon Creek. (*see picture 7*) After identifying the breach, District management was notified and an inspection was scheduled for June 16, 2016.

The levee breach was inspected by Marlin Petermann, Martin Cleveland, Lowell Roeber, Lance Olerich and Zach Nelson on June 16, 2016. After assessing the damage, a plan was established to contact local contractors and repair the levee the following day.

At 8:00pm on June 16, 2014 District Water Supply Superintendent Lance Olerich inspected the breached area and did not notice a change from the erosion that was observed earlier in the day. That night the surrounding area received 3" of rainfall.

At 7:30 am on June 17, 2014, District staff Lowell Roeber and Lance Olerich inspected the Pigeon Creek Levee and identified that the area of the breach had eroded further and that 100% of the water from the creek was flowing into the adjacent farm ground. (*see pictures 8 and 9*) District Management was notified immediately. Two local contractors were called immediately to begin emergency repair work. Leeber Construction, who was performing work for the District at Kramper Lake, mobilized an excavator and dozer to the levee to begin repairs. Oban Construction, who had also performed work for the District in the past, mobilized a long reach excavator and regular excavator to the 200th Street Bridge to remove debris from the creek channel. (*see picture 10*)

At noon, Zach Nelson arrived onsite. By that time both contractors had their equipment onsite and were ready to begin work. Leeber was instructed to push dirt in from both sides of the breach hole to prevent water from flowing into the field to the north. Oban was instructed to remove logs from the channel and place them on outer slope of the levee to be removed at a later time.

At 2:30 pm, Marlin Petermann and Chuck Leinen with the NRCS arrived onsite to inspect the repairs. At that time it was determined to cut a relief outlet on the right bank of the levee, which would allow water to flow into the offline water storage area on the south side of the levee during a high water event. Staff surveyed the levee and determined that an area $\frac{1}{4}$ of a mile downstream of the South Bluff Road Bridge on the right bank of the levee was the best location to cut a relief outlet. The area of the levee that was chosen to cut the relief outlet had experienced significant erosion on the back slope as a result of water overtopping it during the last high water event. Oban Construction was instructed to mobilize a third excavator onsite to open the relief outlet. The relief opening was cut 50 feet wide at an elevation roughly

three feet above the normal water line. This would allow for normal water levels to continue to flow in the creek channel, but flow into the offline storage area during a high water event. *(see picture 11)*

At 6:00 pm Leeber finished moving dirt at the area on the left bank where the breach had occurred. The repair work left the levee elevation approx. four feet lower than the right bank. *(see pictures 12 and 13)* At the same time, Oban had completed the excavation of the relief opening on the left bank and had removed most of the large debris from under the 200th Street Bridge, allowing for normal creek flow.

On 6.18.2014 Leeber used a dozer to clear topsoil piles around the breach area and created wind rows to dry the soil. Leeber completed work by 11:00 am. Oban continued to remove and haul off debris piles near the 200th Street Bridge for the remainder of the day.

On 6.19.2014 District staff placed a plastic liner on the channel face of the breached area in an attempt to reduce erosion caused from rainfall runoff. *(See picture 14)*

At 9:00 am on 6.22.2014 Lance Olerich and Lowell Roeber inspected the Pigeon Creek Levee following a rain event that resulted in 1"-2" of rainfall in the surrounding area. They confirmed that the repaired breach area on the left bank was not damaged and that water had flowed thru the relief outlet that was excavated on the right bank. *(See picture 15)*

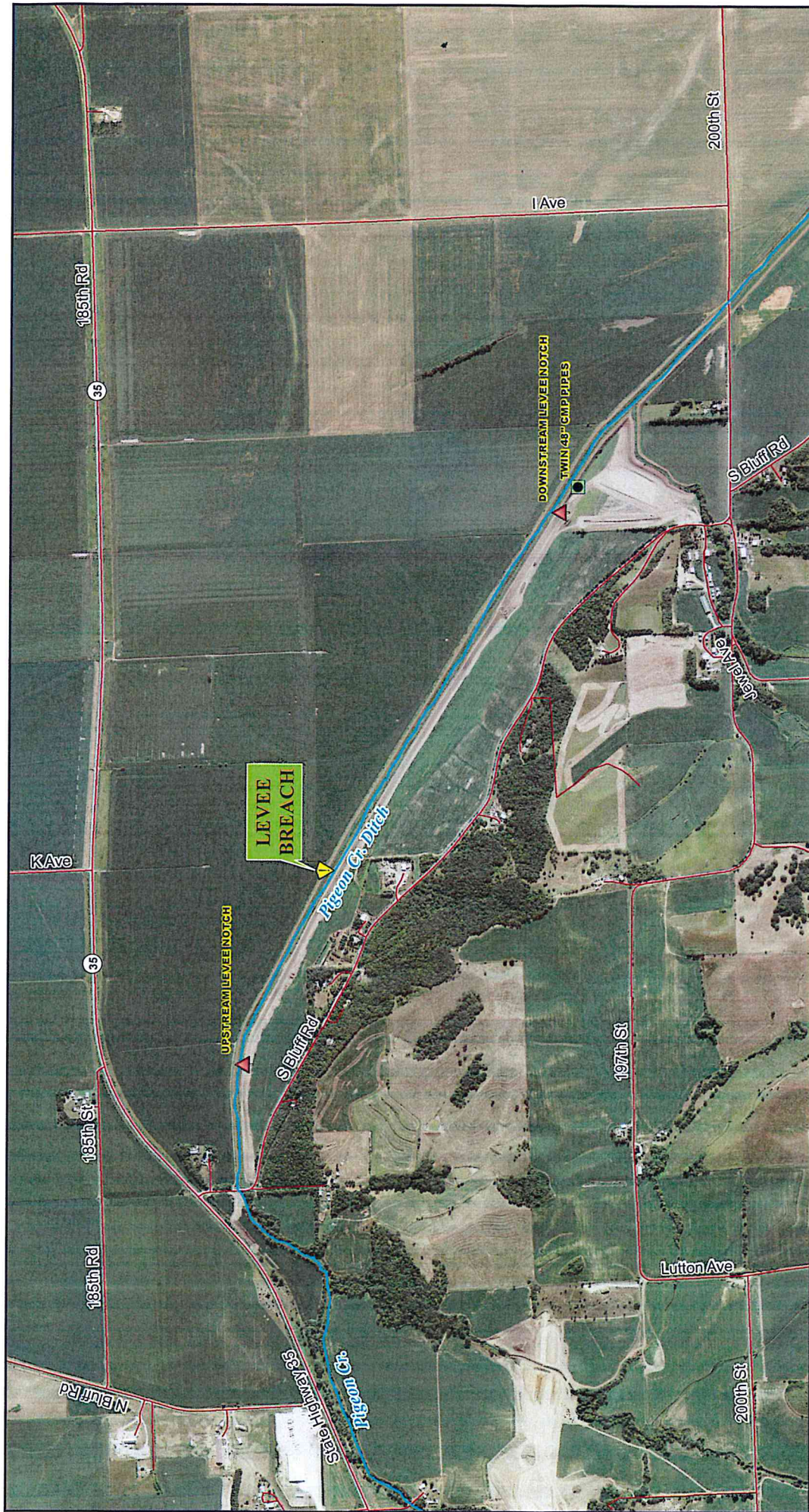
On 6.26.2014 a District survey crew visited the site of the breached area and took GPS coordinates that could be used by District engineers to calculate the quantity of material needed to make final repairs on the levee.

At 7:30 am on 6.30.2014 District staff inspected the levee following 1-2" of rainfall in the area. Water was flowing into the offline storage area and the repaired breach area was intact. The same observation was made at 11:00 am that morning. Over the noon hour, the area received 2-3" of rainfall. Water levels in the creek rose quickly. Water flowed into the offline storage area; however it began to overtop the repaired breach area. By 3:00 pm, the repaired breach area had completely eroded and 100% of water was flowing into the farmland to the north. District management was notified immediately. *(See picture 16)*

On 7.1.2014, Zach Nelson, Lance Olerich, Lowell Roeber, and NRCS Engineer, Chuck Leinen, inspected the area to assess the damage. It was determined that creek flow would need to be diverted 100% into the offline storage area and back into the creek channel downstream, which would allow the breached area to dry out. A temporary dam would be built across the creek channel near the outlet into the offline storage area, which would divert creek flow. Downstream of the breached area, there are two 48" dia culverts that allow water to drain from the offline storage area back into the creek channel. In order to accommodate the increased amount of water flowing into the offline storage area, a 25' wide outlet would be cut into the levee to allow for water to drain more rapidly.

On 7.2.2014, a number of local contractors were contacted about their availability to perform emergency repairs. Steve Harris Construction of Homer, NE was selected due to their ability and willingness to mobilize equipment quickly. At 11:00 am Martin Cleveland and Zach Nelson met with Steve Harris to outline the scope of work and establish hourly rates. At 1:00 pm Martin Cleveland and Zach Nelson met with all four members of the Elk/Pigeon Creek Advisory Board. They were provided with a summary of events and maps of the affected area. They acknowledged that there was a need for PMRNRD staff to make emergency repairs and that a plan for final repairs and financial funding was still pending. By 2:00 pm, Steve Harris Construction had an excavator mobilized and began excavating the outlet to drain the offline storage area downstream of the breached area.

On 7.3.2014, Steve Harris Construction completed the outlet that allowed the offline storage area to drain back into the creek channel downstream of the breach. Crews began work to move dirt in place to create a dam across the creek upstream and force 100% creek flow into the offline storage area. This work is anticipated to take two days. Plans have been made for District staff to inspect the repair work on July 6 and plan to make final repairs for the breached area.



Pigeon Creek Levee Breach, Dakota County

June 15 and June 30, 2014



#1 - 6.15.2014 - breached area looking west



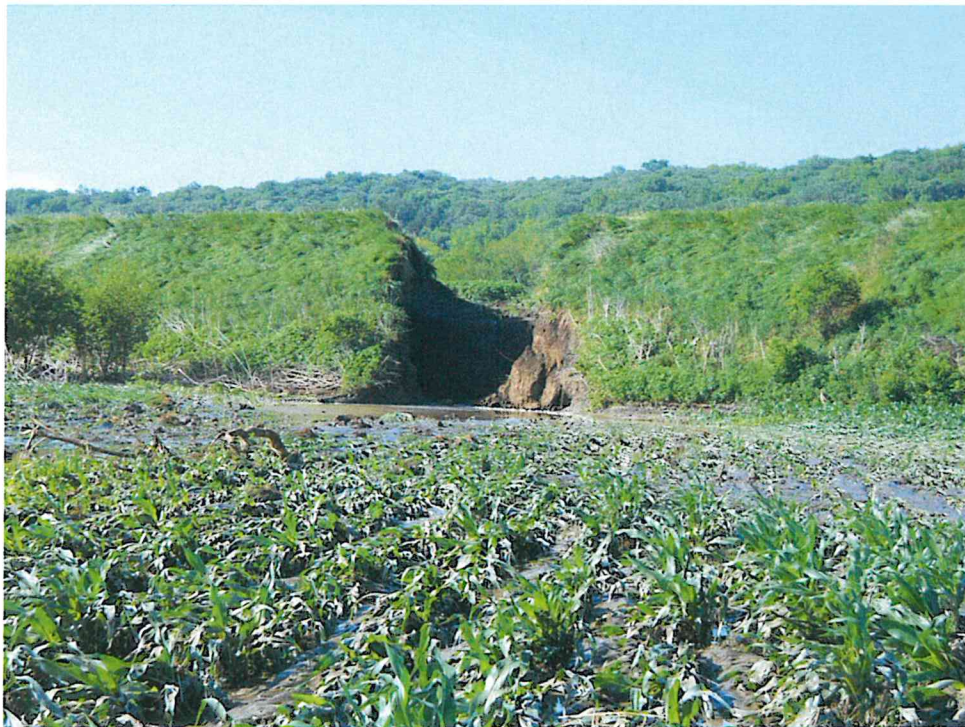
#2 - 6.15.2014 – Breached area where bench was formed



#3 - 6.15.2014 – looking south towards breached area



#4 - 6.15.2014 – looking south towards breached area



#5 - 6.15.2014 – Farmland directly north of breached area



#6 - 6.15.2014 – Offline storage area south of Pigeon Creek



#7 – 6.16.2014 – Debris at 200th Street Bridge



#8 – 6.17.2014 – Area of breach looking upstream



#9 – 6.17.2014 – Area of breach looking north



#10 - 6.17.2014 – Debris removal at 200th Street Bridge



11 – 6.17.2016 – Existing erosion before relief outlet was cut into left (south) bank



#12 – 6.17.2014 – Breached area repairs in progress



#13 – 6.17.2014 – Breached area repairs nearing completion for the day



#14 - 6.19.2014 – Crews put plastic over breached area to reduce rainfall erosion



#15 – 6.22.2014 – View of relief opening in south bank following a 2” rainfall



#16 6.30.2014 – View of creek overtopping breached area

