

MEMO

To:
Beth Vens, District Supervisor
EGLE - SE Michigan District Office
27700 Donald Court
Warren, Michigan 48092-2793

VENSB@michigan.gov

Copies:
Mr. Paul Owens, EGLE
Mr. Brandon Alger, EGLE
Mr. Todd Walton, Ford

Arcadis of Michigan, LLC
28550 Cabot Drive
Suite 500
Novi
Michigan 48377
Tel 248 994 2240
Fax 248 994 2241

From:
Kris Hinskey
Joseph Quinnan

Date:
June 14, 2019

Arcadis Project No.:
MI001454.0007

Subject:
Livonia Transmission Plant
Memo Regarding Email received on 5/26/2019
36200 Plymouth Road, Livonia, Wayne County, Michigan
EGLE Site ID No. 82002970

On behalf of Ford Motor Company (Ford), this memo has been prepared by Arcadis of Michigan, LLC for the Livonia Transmission Plant (LTP) site (the site). In response to the May 26, 2019 email from the Michigan Department of Environmental, Great Lakes, and Energy (EGLE), requesting an update regarding the current water levels with the crawl spaces of homes that reside in Alden Village Subdivision. Below is an update to the memo submitted to EGLE on May 10, 2019.

During the week of April 22, 2019, the Livonia area received approximately 1.22 inches of rain, which likely saturated the ground. During the week of April 29, 2019, the Livonia area received an additional 3.9 inches of rain, with 3.28 inches in a 24-hr period on April 30th and May 1st, which resulted in area wide flooding and road closures (AccuWeather, 2019). Governor Whitmer declared a state of emergency in nearby Wayne County, where 3,000 homes were flooded and the Southfield Freeway was closed (Associated Press, 2019). The precipitation totals from the months of April, May, and June combined has been 10.49 inches.

MEMO

Since the initial flooding response, Arcadis has been routinely surveying and responding to flooding associated with the above average rainfall that occurred in April, May, and June. Efforts have included water removal, liner inspections, and liner repairs. The work was conducted during high water levels and as water levels have subsided in affected homes within the Alden Village Subdivision.

Arcadis continues to assess the homes within the crawl spaces when more than 1 inch of rain falls within 24 hours. The following table summarizes the visitations and repairs of the liners, as of June 14, 2019.

Date	Property Address	Observations
April 26, 2019	34450 Beacon	Arcadis immediately responded to email regarding flooding under the crawl space. Air purifier provided to property owner. Arcadis completed visual inspection of crawl space and liner. 50 gallons of water removed and placed in a 55-gallon drum for disposal. Pumping did not affect water level. The three green drains were capped with a 3-inch expansion cap.
April 27, 2019	34450 Beacon (2 nd Visit)	Arcadis completed visual inspection of crawl space and liner. 170 gallons of water removed and placed in a 250-gallon tote. Pumping did not affect water level. Compromised seal observed in liner. Appears hydrostatic pressure of water split the liner at a seam. Liner to be assessed once water level subsides.
April 29, 2019	34450 Beacon (3 rd Visit)	Verified that water was still present within crawl space. No increase of water observed.
April 30, 2019	34450 Beacon (4 th Visit)	Attempted to remove water via a shop vacuum. Water level did not subside.
	12070 Boston Post	Water was observed infiltrating around the perimeter of the basement. Water was observed to be draining through the green drain that was placed in the floor drain. Sump pump was on and working. Crawl space was dry. Air purifier in operation. Interim pre-emptive mitigation system is in operation.
	34682 Beacon	Water was observed on the crawl space liner. Estimated volume was 3 to 4 gallons. Water could be felt under the liner. Interim pre-emptive mitigation system is in operation.
May 1 and 2, 2019	12066 Boston Post	Water was observed on the liner near the location where a green drain was present. Green drain was submerged. Interim pre-emptive mitigation system is in operation.
	34920 Beacon	No water present. Interim pre-emptive mitigation system is in operation.
	34940 Beacon	Basement with sump. No water present. Interim pre-emptive mitigation system is in operation.
	34990 Beacon	No water present. Interim pre-emptive mitigation system is in operation.
	34950 Beacon	No water present. Interim pre-emptive mitigation system is in operation.
	34380 Beacon	Localized water observed on the liner and appeared to be coming through a seam on the northern portion of the crawl space. Southern

Date	Property Address	Observations
		half of the crawl space appears dry. Interim pre-emptive mitigation system is in operation.
May 1 and 2, 2019	34424 Beacon	No water present. Homeowner indicated that sump has been operating continuously. Interim pre-emptive mitigation system is in operation.
	12088 Brewster	Water on liner near suction point located in the northern portion of the crawl space. Interim pre-emptive mitigation system is in operation.
	12075 Brewster	Homeowner not home, could not assess. Interim pre-emptive mitigation system is in operation. No alarms received indicating the system was offline.
	12091 Brewster	No water present. Interim pre-emptive mitigation system is in operation.
	34401 Capital	Water present on the liner. Interim pre-emptive mitigation system in operation. Interim pre-emptive mitigation system is in operation.
	12017 Brewster	No water present. Interim pre-emptive mitigation system is in operation.
	34591 Beacon	Water is present on the liner and accumulated in the low spots of the crawl space. Interim pre-emptive mitigation system is in operation.
	12100 Beacon	No water present. Interim pre-emptive mitigation system is in operation.
	12131 Boston Post	Water infiltrating through the basement floor and walls near the base of the basement. Interim pre-emptive mitigation system in operation. Air purifier is present and on.
	12141 Boston Post	No water present. Interim pre-emptive mitigation system is in operation.
	12089 Boston Post	Property owner contacted Arcadis on May 1, 2019, indicating that there appears to be water in the suction lines of the mitigation system. Property owner turned off the interim pre-emptive mitigation system until Arcadis could assess. Arcadis offered an air purifier to the property owner on May 1, 2019, but the property owner declined. Arcadis received notice on May 2, 2019 that the interim pre-emptive mitigation system was turned on.
May 3, 2019	34401 Capital (2 nd Visit)	Completed a visual inspection to determine if water was still present in crawl space or if water on top of the liner had increased. No evidence was observed an increase in volume.
	34450 Beacon (5 th Visit)	Completed a visual inspection of flooding conditions at the property. Discussed with property owner that the water will be removed as soon as the water level subsides.
May 6, 2019	34682 Beacon (2 nd Visit)	Completed a visual inspection to determine if water was still present in crawl space or if water on top of the liner had increased. Based on the visual inspection, it appeared that water on the liner had increased from the Initial May 1 and 2, 2019 inspection.
	34450 Beacon (6 th Visit)	Completed a visual inspection of the flooding conditions at the property. Discussed with property owner that the water will be removed as soon as the water on the property went down. Property owner indicated that when he was younger, that he used to pump the water from under the

Date	Property Address	Observations
		crawl space to the ditch when the flooding accumulated in the crawl space.
May 6, 2019	12088 Brewster (2 nd Visit)	Completed a visual inspection to determine if water was still present in crawl space or if water on top of the liner had increased. No evidence was observed an increase in volume.
May 7, 2019	34450 Beacon (7 th Visit)	Completed visual inspection of flooding conditions at the property.
	34380 Beacon (2 nd Visit)	Crawl space inspected and minimal water present on the liner. Interim preemptive mitigation system is in operation.
	34450 Beacon (8 th Visit)	Completed visual inspection of flooding conditions at the property. Property is still flooded.
	34401 Capital (3 rd Visit)	Pumped approximately 25 gallons of water from the crawl space. 4 seams in the liner were compromised. Three seams were able to be repaired, but the fourth seam could not because water remained under the liner. Green drains were plugged. Property owner was offered an air purifier, until the fourth seam could be repaired. The air purifier was accepted and is currently in operation. Interim pre-emptive mitigation system was in operation. Arcadis also observed two potable water lines that are leaking and will need repair.
May 9, 2019	34591 Beacon (2 nd Visit)	Pumped approximately 40 gallons of water from the crawl space. Liner appears to be intact and no compromised seams.
	12066 Boston Post (2 nd Visit)	Pumped approximately 20 gallons of water from the crawl space. Liner appears to be intact and no compromised seams. Green drains were sealed.
	34682 Beacon (3 rd Visit)	Inspected crawl space to determine if water was present. Water was identified in the crawl space similar to the observations detail on May 1 and 2, 2019. No additional water was identified. Currently working with property owner to schedule dewatering.
	12088 Brewster (3 rd Visit)	Currently scheduled to assess the liner and perform dewatering, if necessary, on May 10, 2019.
	34401 Capitol (4 th Visit)	Water was evacuated from the liner, which reveal 4 compromised seams. Green drains were sealed and 3 of the 4 compromised seams were resealed. The 4 compromised seal could not be repaired due to the water being present and infiltrating due to high water level.
May 10, 2019	12075 Brewster (2 nd Visit)	Property owners are on vacation. Crawl space entrance is located in the house. Unable to inspect the liner and verify if water is present.
	34682 Beacon (4 th Visit)	Water was identified on top of the liner. Minimal amount of water was removed. Multiple seams were identified to be compromised. The compromised seals were sealed and repaired.
	12088 Brewster (4 th Visit)	Water was observed on the liner and was removed, and the green drains were sealed. Multiple liner seams were compromised and fixed.

MEMO

Date	Property Address	Observations
	34591 Beacon (3rd Visit)	No water observed on the liner after repairs were conducted on May 9, 2019.
	34450 Beacon (9th Visit)	Water level is still elevated with water present in the yard. Visual inspected identified one seam that will need to be repaired.
May 14, 2019	34450 Beacon (10th Visit)	Water still present on the liner and repairs are needed once the water level resides.
	34401 Capitol (5th Visit)	Water still present on the liner and repairs are needed once the water level resides.
	34591 Beacon (4th Visit)	Water is present and liner continues to be assessed.
	12066 Boston Post (3rd Visit)	Water is present and liner continues to be assessed.
	12100 Boston Post	Small amount of water was observed on the liner.
May 17, 2019	34401 Capitol (6th Visit)	No water was observed on the liner. Additional liner repairs were conducted to seal compromised seams.
	12075 Brewster (3rd Visit)	Property owners returned from vacation and the liner was inspected. Small amount of water was present, no seams were identified to be compromised.
	34380 Beacon (3rd Visit)	Small amount of water was observed on the liner.
May 21, 2019	34450 Beacon (10th Visit)	Water observed on the liner. Removed approximately 40 gallons of water to evaluate if water levels had subsided to assess and repair water. Water continued to infiltrate.
May 22, 2019	34401 Capitol (7th Visit)	Water was observed on the liner, removed approximately 5 gallons of water.
	34380 Beacon (4th Visit)	Observed water on the liner, approximately 10 gallons of water was removed. Sealed 2 of the 3 green drains in order to eliminate water infiltration.
	12066 Boston Post (4th Visit)	Water was observed on the liner an approximately 10 gallons of water was removed.
	34591 Beacon (5th Visit)	Water was observed on the liner an approximately 10 gallons of water was removed.
	34450 Beacon (11th Visit)	Water was observed on the liner an approximately 5 gallons of water was removed.
June 8, 2019	34401 Capitol (8th Visit)	No water was observed on the liner. Liner inspected and remaining seams were repaired. No additional work is expected at this location.
	12075 Brewster (4th Visit)	Liner was inspected and water was observed on the liner. Water observed on the liner was determined to be coming from a potable

Date	Property Address	Observations
		water leak. The potable water leak was repaired and water on the liner was evacuated.
June 11, 2019	34450 Beacon (12 th Visit)	Remaining water on liner removed now that water levels have resided. All compromised seams were repaired and sealed. All green seals were sealed.
	12100 Boston Post (2 nd Site Visit)	No water was present, and no seams were compromised.
June 12, 2019	34380 Beacon (5 th Visit)	Very small amount of water was removed from the liner. Compromised liner seams were repaired and sealed. The remaining green seal was also sealed.
June 13, 2019	34380 Beacon (6 th Visit)	The liner was inspected after seam repair and any additional seams not identified on June 12, 2019 were repaired.
June 14, 2019	12066 Boston Post (5 th Visit)	Water was observed on the liner. The water is attributed to the rain fall that occurred on June 13-14, 2019 leaking through or between gaps in the crawl space exterior door. The water was removed and a permanent solution to eliminate rainwater from entering the crawl space is currently being determined.

When rain falls are heavy and exceed over an inch of rain within a 24-hour period, Arcadis will complete inspections at properties that have previously showed signs of water infiltration within the crawl spaces.

Finally, Arcadis and Ford are reviewing administrative and technical measures that can be defined now so that we can proactively address future flooding events in the neighborhood.

References

AccuWeather, 2019. <https://www.accuweather.com/en/us/livonia-mi/48150/may-weather/338728?monyr=5/1/2019&view=table>

Associated press, 2019. <https://www.usnews.com/news/best-states/michigan/articles/2019-05-02/southeastern-michigan-braces-for-more-rain-after-flooding>.