



**Conservation Plan for Bigeye Chub (*Hybopsis amblops*)
Incidental Take Authorization Application**



**Applicant: Marathon Petroleum Company LP
Robinson Refinery--Crawford County, Illinois**

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(Project No. 1604001, P2)**

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Introduction and Background

The Marathon Petroleum Company LP (MPC) Robinson Refinery is located in Robinson, Illinois, in Crawford County (Figure 1). The refinery was built in 1906 by Lincoln Oil Company and purchased in 1924 by MPC (then The Ohio Oil Company). Operations include crude distillation, catalytic cracking, hydrocracking, hydrotreating, coking, reforming, alkylation, aromatics extraction, isomerization, and sulfur recovery. Robinson Refinery has a refining capacity of 270,200 barrels/day of sweet and sour crude oil to produce gasoline, distillates, jet fuel, liquefied petroleum gas (LPG), petroleum coke, aromatics, sulfur, and slurry that are distributed by pipeline, transport truck, and rail. The facility employs approximately 365 full-time workers, 22 part-time workers, and 470 contractor personnel.

Robinson Refinery has one process wastewater outfall (MPC 001) that discharges into Robinson Creek (National Pollutant Discharge Elimination System (NPDES) Permit #IL0004073) at river-mile (RM) 5.00, about 0.50 miles downstream of the confluence of Quail Creek and Robinson Creek (Figure 2).¹ Plant operation results in a historical average discharge of 2.65 million gallons/day (MGD) of wastewater treatment effluent (including treated process wastewater and stormwater runoff) from MPC 001, with a peak flow of 4.32 MGD. Stripped sour water, desalter water, cooling tower blowdown, boiler blowdown, and coker sluiceway purge are the main contributors to the thermal loading from the MPC 001 outfall. Source water is obtained from MPC-owned wells and surface impoundments and supplemented with purchased water from the Robinson-Palestine Water Commission.

The City of Robinson operates a publicly owned treatment works that also discharges to Robinson Creek approximately 1.5 River Miles upstream of the Refinery's Outfall MPC 001 with an average permitted flow of 2.5 MGD. Variability of ambient temperatures and upstream flows, including the City of Robinson's discharges, along with the stream's physical characteristics (e.g., intermittent vegetative cover), make Robinson Creek susceptible to anthropomorphic temperature changes.

316(a) Demonstration/Alternative Thermal Effluent Standards Case (PCB 2018-049)

On December 15, 2017, MPC filed a petition requesting that the Illinois Pollution Control Board (IPCB or Board) grant an alternative thermal effluent limitation (ATEL) for discharges from its Crawford County petroleum refinery into Robinson Creek through Outfall MPC 001 under Subpart K of the Board's procedural rules at 35 Ill. Adm. Code 106.1100 – 106.1180).

¹ The Refinery also has eight additional NPDES permitted outfalls that go either directly or indirectly to Robinson Creek or Marathon Creek, but these do not have a thermal component and remain fully compliant with all other permit limitations.

MPC requested that its proposed alternative limitations apply instead of those included in its NPDES Permit, which are based on the Board's General Use water quality standards for temperature (35 Ill. Adm. Code 302.211). MPC also requested relief from the mixing zone regulations in 35 Ill. Adm. Code 302.102(b)(8) to allow for the use of 100% of Robinson Creek for mixing with no zone of passage. This ATEL request was made in order to allow MPC to ensure continuing thermal compliance for its existing thermal discharge and **not** for an increase in the temperature or peak flow volume of its thermal effluent.

Based on the extensive record of information provided in the MPC 316(a) Demonstration, the Board found that MPC had successfully demonstrated that the thermal effluent limitations based on the Board's temperature water quality standards under Sections 302.211(d) and (e), and the mixing zone requirement under Section 302.102(b)(8), as applicable to the MPC 001 discharge, were more stringent than required by EPA standards to assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on Robinson Creek.²

Within the context of the ATEL Demonstration process, the Illinois Department of Natural Resources (IDNR) recommended that MPC seek an Incidental Take Authorization (ITA) for the state-threatened Bigeye Chub (*Hybopsis amblops*) to cover potential impacts which could occur under certain circumstances. This recommendation was included as a requirement in the Board Order granting the ATELS (April 7, 2022, Order, p. 71, No. 4)³ and was subsequently incorporated as Special Condition 8D in MPC's NPDES permit (IL0004073 issued 8/30/2022).

Therefore, this Conservation Plan has been prepared for an ITA from the IDNR for potential unavoidable impacts to the state-threatened Bigeye Chub (*Hybopsis amblops*) as the result of normal business operations at the MPC Robinson Refinery, including discharge of thermal effluent from the refinery and monitoring of thermal conditions in Robinson Creek. Title 17, Chapter 1 (c), Section 1080 of the Illinois Administrative Code (Incidental Taking of Endangered or Threatened Species) grants IDNR the authority to permit the incidental taking of endangered or threatened species with an approved Conservation Plan. **MPC requests that this ITA be approved and issued for a period covering ten (10) years.**

² Please see the Board Opinion and Order in IPCB 2018-049 (dated April 7, 2022) for complete information on the 316(a) Demonstration components and the Board's rationale for granting MPC's request for alternative thermal effluent standards (Link to case file included in this ITA submittal under Exhibit 1).

³ Op. cit.

1. Description of Affected Area

1A. Project Location / Estimated Area of Impact

MPC's Robinson Refinery is located at 400 S. Marathon Avenue, Robinson, Illinois. The Refinery is bound by E. Main St. to the north, S. Eaton St. to the west, E. 950th Ave. to the south, and N. 1300th St. to the east. Outfall MPC 001 is located about 1.50 miles to the northeast on Robinson Creek (Figure 2; Photolog).

Robinson Creek, a tributary of Sugar Creek, is approximately 8.5-miles long and begins about 1.0-mile upstream of Washington Park's Deer Run Golf Course. Robinson Creek flows easterly for approximately 3.0-miles to the confluence with Quail Creek, and another 5.5-miles to Sugar Creek. Sugar Creek drains into the Wabash River, which forms the Illinois and Indiana border about 5.0-miles downstream of the Robinson Creek-Sugar Creek confluence. Lamotte Creek is a tributary to Sugar Creek located south and west of Palestine, IL. The primary tributary to upper Robinson Creek is Quail Creek, which is a 3.0-mile-long tributary that flows through the Quail Creek Country Club and Resort and drains into Robinson Creek at about RM 5.50 (0.50-miles upstream of MPC 001). Additional upper Robinson Creek tributaries include Marathon Creek (RM 4.95) and two unnamed tributaries (RM 4.77 and RM 3.70) that receive permitted stormwater runoff from the Robinson Refinery. Both Quail Creek and the upstream portion of Robinson Creek are located within the City of Robinson, whereas the downstream portion of Robinson Creek flows through agriculturally-dominated lands. Upper Robinson Creek is impacted mostly by urban development that includes both municipal and industrial point source discharges and riparian encroachment, while lower Robinson Creek receives water and runoff from unnamed tributaries, short-lived stream channels, and ditches on agricultural lands (MBI 2017a). Robinson Refinery's Outfall MPC 001 discharges into Robinson Creek at RM 5.00 at the following GPS coordinates: 39.01301, -87.70779 (Figure 2).

Area of Potential Impact:

The total estimated area of Robinson Creek from the MPC 001 Outfall to the IL Route 1 Bridge is **between 5.5 and 6 acres**. This represents a bank-to-bank measurement and worst-case estimate of the potential area of impact, since there is no detailed information available on the amount of preferred habitat for the Bigeye Chub within this broad area. This estimate does not account for the fact that thermal conditions in the stream may only result in take during certain limited periods of time, depending upon weather, flow, and facility operations. This area also encompasses the location of the temperature monitoring installation. The estimated area of

temporary disturbance in the stream required for the monitor installation is approximately **0.002 acres**.⁴

1B. Biological Data

Bigeye Chub

The Bigeye Chub (*Hybopsis amblops*) (Family Leuciscidae) is listed as a threatened species in Illinois (IESPB 2020).⁵ It is a slender-bodied minnow that attains a length of about three-inches with a maximum total length of four-inches. The Bigeye Chub has a small, horizontal, overhanging mouth with barbels at each corner, blunt snout, prominent black lateral stripe that extends from the tip of the snout to the caudal peduncle, and a large eye with a diameter slightly greater than the length of snout (Etnier and Starnes 1993; Pflieger 1997; Smith 1979; Boschung and Mayden 2004). Breeding males do not have bright colors, but they develop small tubercles on the top and posterior sides of the head as well as on the outer pectoral fin rays. The front edge of the dorsal fin is about midway between tip of snout and caudal fin base (Pflieger 1997).



Source: IDNR

Bigeye Chub occurs in the southern Great Lakes Basin, Mississippi River Basin from the Illinois River throughout the state of Ohio, the Cumberland and Tennessee river drainages, and west of the Mississippi River from Central Arkansas River northeast to the Meramec River (Etnier and Starnes 1993; Fishbase 2019). The Bigeye Chub is considered an imperiled species showing more recent evidence of recovery in Illinois, as reflected by its recent change in listing status. It was formerly widespread across southern and eastern Illinois and could be found in rocky, free-flowing areas, often near vegetation in small to medium rivers (Smith 1979; Page and Retzer 2002; Sherwood and Wylie 2015). However, *H. amblops* declined in abundance and range due to water quality degradation and habitat alterations in Illinois, and thus likely became

⁴ GIS shapefiles defining the affected areas have been provided to IDNR separately

⁵ This species was formerly listed as state-endangered, but its status was changed to threatened during the 2020 Revision of the Illinois List of Endangered and Threatened Species. (Confirmed at the 184th meeting of the Illinois Endangered Species Protection Board (IESPB) on 15 November 2019).

https://www2.illinois.gov/dnr/ESPB/Pages/Illinois_Endangered_Threatened_Species_List_Review_2020.aspx

extirpated by the 1970s (Smith 1971; Smith 1979; Warren and Burr 1988).

States that have assigned conservation status to the Bigeye Chub include Alabama (vulnerable), Arkansas (apparently secure), Georgia (vulnerable), Illinois (critically impaired), Indiana (apparently secure), Kentucky (apparently secure), Michigan (possibly extirpated), Missouri (under review), North Carolina (vulnerable), New York (critically extirpated), Ohio (apparently secure), Oklahoma (vulnerable), Pennsylvania (apparently secure), Tennessee (secure), Virginia (vulnerable), and West Virginia (apparently secure) (NSE 2022).

Bigeye Chub are typically found in small-to-medium waterways and avoid large rivers and headwaters (Etnier and Starnes 1993). They inhabit permanent flowing pools of little to moderate current with silt-free sand, fine-gravel substrates, rubble, and/or bedrock. The pools tend to be clear and well-vegetated with beds of emergent aquatic plants (Smith 1979; Page and Burr 2011). The Bigeye Chub has few external taste buds and large eyes that suggests it feeds mostly by sight (Pflieger 1997; IDNR and NHD 2019). Etnier and Starnes (1993) reported that in addition to the expected midge larvae found in the gut contents of collected Bigeye Chub, approximately equal numbers of large mayfly and stonefly nymphs and a single caddisfly larva were also present, which implies they feed in coarser substrates than what is typical of their described habitat.

In 1992, *H. amblops* was rediscovered from the Little Vermilion River (Burr et al. 1996), and populations have since rebounded in Illinois, likely because of improved physicochemical conditions of streams, concurrent with the availability of suitable habitat. The minnow now occurs throughout the Wabash River drainage basin and a small portion of the Kankakee River drainage basin (Burr et al. 1996; Page and Retzer 2002; Tiemann et al. 2004; Sherwood and Wylie 2015). This distributional expansion and increase in abundance in Illinois resulted in downlisting the fish's conservation status from state-endangered (IESPB 2015) to state-threatened (IESPB 2000).

The Midwest Biodiversity Institute (MBI) collected the state-listed Bigeye Chub (*Hybopsis amblops*) during 2016 surveys of Robinson Creek that were conducted to support the MPC ATEL Demonstration (MBI 2017a). Four Bigeye Chub specimens were collected among three locations in close proximity to MPC 001 in Robinson Creek (one upstream and three downstream), with a total of eight (8) collected over the entire study area, which included Lamotte Creek (outside of any thermal influence of MPC 001) (Figure 3). These unexpected collections represented new distribution records since Robinson Creek was assumed to be outside of the normal range of this species at that time. No other state or federally listed species were collected. There were no occurrences of deformities, erosions, lesions, and tumors in the eight individuals collected (MBI 2018).

The 2016 study of the waterways in the vicinity of the Robinson Refinery yielded a total of 56 fish species and one hybrid. Nine (9) species made up approximately 83% of the total catch, by number: Silverjaw Minnow (23.27%), Creek Chub (21.31%), Bluegill (10.31%), Green Sunfish (7.44%), Bluntnose Minnow (5.45%), White Sucker (4.85%), Central Stoneroller (4.11%), Emerald Shiner (3.58%), and Longear Sunfish (2.43%). Largemouth Bass, Gizzard Shad, Common Carp, Johnny Darter, Mississippi Silvery Minnow, Spotfin Shiner, and Yellow Bullhead were found in small numbers and collectively represented approximately 10% of the total number (9860) collected. The relative abundance of 39 of the 56 species collected were individually less than one percent of the total and collectively represented 6.7% of the total catch for the entire study area. Bigeye Chub represented only 0.08% of the total (MBI 2017a-App. B-2).

The existing literature regarding the decline and resurgence of Bigeye Chub in Illinois and similar results in Ohio show that this species is rapidly reoccupying its former range where sufficient habitat and water quality exists. In large part, this resurgence is apparently due to the lessening of nonpoint source impacts that historically degraded habitat quality and specifically bottom substrates (Smith 1979; Trautman 1981; IESPB 2006). The occurrence of Bigeye Chub in Robinson Creek, albeit represented by only four fish in the mainstem, demonstrates their ability to move into and through the documented thermal and non-thermal pollution zones as has been demonstrated elsewhere (Yoder et al. 2018). Their documented presence in 2016 may be part of the range-wide expansion in the upper Wabash basin, as previous fish surveys conducted during 2013 did not report Bigeye Chub in Robinson Creek, Sugar Creek, or the Wabash River Drainage (MBI 2019). Although there are no comprehensive monitoring programs for Bigeye Chub in the Robinson Creek area, more recent data obtained from IDNR since 2016 shows that Bigeye Chub abundance has generally increased in the Vermillion River and its tributaries. The data also indicates that only two Bigeye Chub were identified in Lamotte Creek in Crawford County in 2021, but no Bigeye Chub were identified in Robinson Creek. (Tara Kieninger, IDNR personal communication, 18 July 2022). Recent sampling in Robinson Creek in October 2022 from another MPC study yielded a total of six (6) adult Bigeye Chub collected by electrofishing; all found well downstream of the IL Route 1 Bridge (EA personal communication, 10 January 2023).

Spawning season for Bigeye Chub has been thought to generally occur in the late spring to early summer. Pflieger (1997) collected breeding adults in Missouri in June, which is supported by collections made in Tennessee, Illinois, and Alabama (Etnier and Starnes 1993; Smith 1979; Boschung 2004). Based on a recent study on the Salt Fork of the Vermillion River in Illinois, published in 2022, Bigeye Chub were found to spawn in moderate water velocity over sandy gravel substrates when water temperatures are between 18-22 °C (64.4-71.6 °F), which helps further define the spawning season between mid-May and mid-June in Illinois waters (Tiemann,

et al. 2022). Bigeye Chub are highly vulnerable to siltation and intolerant of reservoirs, so they are generally indicators of excellent water quality (Smith 1979; Boschung 2004). Increasing turbidity and waterway impoundments have played a large role in the extirpation of the Bigeye Chub (Smith 1979; Page and Burr 2011). The fact that Bigeye Chub have been found near MPC 001 suggests that the overall physical and chemical habitat of Robinson Creek is favorable for this species, despite the current municipal and industrial inputs.

1C. Activities That May Affect Bigeye Chub

The on-going thermal discharge from MPC's Robinson Refinery (Outfall MPC 001), as the result of normal facility operations, is the primary activity that may potentially affect Bigeye Chub in Robinson Creek under certain conditions. The NPDES-required installation of water temperature monitoring equipment by MPC in Robinson Creek represents a temporary (one-time) activity that may also affect Bigeye Chub in Robinson Creek due to a potential and temporary increase in disturbance and/or siltation.

Background Information—Thermal Discharge

Outfall MPC 001, which is authorized by NPDES Permit #IL0004073, discharges into Robinson Creek approximately 0.50 miles downstream of the Quail Creek-Robinson Creek confluence. MPC 001 has a Board-approved 1.7-mile mixing-zone, which starts at the outfall and ends at the IL Route 1 Bridge (compliance point).⁶

The General Use thermal water quality standards apply to Robinson Creek in the absence of an approved site-specific 316(a) Demonstration. These effluent limitations for temperature were set forth in Special Condition 8 of the prior MPC NPDES Permit, as follows:

For Outfall 001, discharge of wastewater from this facility must not alone or in combination with other sources cause the receiving stream to violate the following thermal limitations at the edge of the mixing zone, which is defined by Section 302.211, Illinois Administration (sic) Code, Title 35, Chapter 1, Subtitle C, as amended:

- A. Maximum temperature rise above natural temperature must not exceed 5°F (2.8°C).
- B. Water temperature at representative locations in the main river shall not exceed the maximum limits in the following table during more than one (1) percent of the hours in the

⁶ According to EPA's Technical Support Document for Water Quality-based Toxics Control (TSD) (USEPA, 1991), "a mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented." (Water quality criteria must be met at the edge of a mixing zone.)

12-month period ending with any month. Moreover, at no time shall the water temperature at such locations exceed the maximum limits in the following table by more than 3°F (1.7°C). (Main river temperatures are temperatures of those portions of the river essentially similar to and following the same thermal regimes as the temperature of the main flow of the river.)

	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
°F	60	60	60	90	90	90	90	90	90	90	90	60
°C	16	16	16	32	32	32	32	32	32	32	32	16

Alternative Thermal Effluent Limitations

In accordance with the Board Order granting site-specific ATEs to MPC in PCB 2018-049 (April 7, 2022, Order—Exhibit 1), the following thermal standards now apply to the MPC 001 outfall under the new NPDES Permit that was issued on August 30, 2022, with an effective date of October 1, 2022. The provisions of these ATEs are outlined below (from Board Order dated April 7, 2022, p. 71—Exhibit 1) and are reflected in Special Condition 8 of the new NPDES Permit:

1. Temperature

- a. Instead of thermal effluent limitations based on the temperature water quality standards in 35 Ill. Adm. Code 302.211(e), the following daily maximum temperature effluent limitations apply:

Month	Daily Maximum Temperature (°F)	Daily Maximum Temperature (°C)
January	65	18.3
February	65	18.3
March	74	23.3
April	82	27.8
May	88	31.1
June	90	32.2
July	90	32.2
August	90	32.2
September	90	32.2
October	87	30.6
November	85	29.4
December	74	23.2

- b. Instead of the water temperature requirements of 35 Ill. Adm. Code 302.211(d) and (e), the effluent temperatures must not exceed the daily maximum temperature limitations in paragraph (1)(a) during more than 1% of the hours (87.6 hours) in the 12-month period ending with any month. Moreover, the effluent temperature must never exceed the daily maximum limitations in paragraph 1(a) by more than 3°F (1.7°C).
 - c. The average water temperature for the period starting from June 16 and ending on September 15 must not exceed 87°F (30.6°C).
 - d. For purposes of paragraph (1), Robinson Creek temperatures are temperatures of those portions of the creek essentially similar to and the same thermal regimes as the temperature of the main flow of the creek
2. **Mixing Zone.** The alternative thermal effluent limitations in paragraphs (1)(a), (1)(b), and (1)(c) apply at the edge of the mixing zone that extends from Marathon Outfall 001 to monitoring location located at a point instream either at the IL Route 1 bridge or upstream and near the IL Route 1 bridge.
 3. **Zone of Passage.** Instead of 35 Ill. Adm. Code 302.102(b)(8), the mixing zone identified in paragraph (2) may include the entire cross-sectional area and volume of flow of the Robinson Creek.

1D. Anticipated Adverse Effects on Bigeye Chub

Basis for Potential Adverse Effects: Bigeye Chub Thermal Response Study

In 2018, at the request of IDNR, Dr. Suski and Qihong Dai of the University of Illinois at Urbana-Champaign (Suski Lab) conducted a thermal bioassay using Bigeye Chub and Sand Shiner collected from the Middle Fork Vermilion River at Kennekuk Cove County Park near Danville, IL (IDNR 2018a, 2018b; Suski and Dai 2018). The Suski Lab found that Bigeye Chubs (n = 20) acclimated to 69.8 °F (21 °C) exhibited avoidance behaviors at between 83.5 °F and 88.2 °F (29.9 °C +/- Standard Deviation (SD) of 1.3 °C) and lost equilibrium at between 90.3 °F and 91.8 °F (32.8 °C +/- SD of 0.4 °C), whereas Bigeye Chub (n = 20) acclimated to 78.8 °F (26 °C) exhibited avoidance behaviors at between 89.4 °F and 94.5 °F (33.3 °C +/- SD of 1.4 °C) and lost equilibrium at between 95.9 °F and 99.1 °F (36.4 °C +/- SD of 0.9 °C) (Suski and Dai 2018). It should be noted that the study was conducted in a controlled environment and may or may not represent the species temperature tolerance in the field. The higher acclimation temperature data is likely more reflective of actual conditions encountered in Robinson Creek during the warmer parts of the year. At the higher acclimation temperature, the mean avoidance and loss of equilibrium temperatures (91.4 °F and 96.8 °F, respectively) are both higher than

what the MPC ATELS allow at the compliance monitoring point, but it is possible that these temperatures could be exceeded within the mixing zone and could result in take (in the form of avoidance) of Bigeye Chub.

No Anticipated Effects on Early Life Stages

Since the highest expected temperatures from the MPC thermal discharge and throughout the mixing zone would occur during the months of July and August, early life stages (eggs and fry) would not be expected to be present at this time and would therefore not be negatively impacted.

Temperatures Within Regulatory Mixing Zone and Possible Take

Water temperatures downstream of the MPC 001 discharge and upstream of the compliance point (IL Route 1 Bridge) will, periodically, be higher than the corresponding temperatures outlined in the ATELS; however, the MPC thermal discharge is allowed a mixing zone within which water temperatures may be higher than the final compliance limit, as long as there are not any acutely toxic conditions. There will be a continuum of decreasing temperature from the outfall point to the compliance point at all times; additionally, there are documented fluctuations in temperature that can provide additional thermal relief within the mixing zone area, which are detailed in the IPCB Case record (Exhibits 4 and 6 of the Case Record, as well as summary in Board Order dated 4/7/2022, p. 45.) (Location RC05 is immediately downstream of the thermal discharge point in Robinson Creek):

The analysis of the 2016 HOBO results (RC05) indicated a total of eight thermal stress periods of 1.5 to 14.5 hours in duration for a total of 74.4 hours over the summer. Id. at 19. Each stress period was followed by one or two stress recovery periods of 1.5 to 302 hours duration for a total of 773.9 hours. Id., Table 14. MBI notes that the first and last thermal stress periods occurred on July 24 (9.5 hrs.) and August 30 (9.5 hours), respectively. The highest maximum temperature of 92.3°F occurred on August 28. The longest thermal stress period of 14.5 hours occurred on August 10 and was followed by 12.2 hours on August 11, 5.5 hours on August 12, and 1.5 hours on August 13. While there was no significant recovery between August 10 and 13, a stress recovery period initiated on August 13 lasted for 302 hours (until August 26). Id., Table 14.

For the summer period studied, the ratio of recovery to stress hours was 10.5:1 for the 2016 HOBO results and is sufficient to rule out any long-term adverse effects to the fish assemblage and the balance of the aquatic biota in Robinson Creek under that thermal regime (MBI Report-Exhibit 4 of Board Case Record, p. 20).

Possible Take Associated with On-Going Thermal Discharge

For adult Bigeye Chub, the most probable adverse impact of the MPC 001 thermal discharge would be in the form of avoidance of areas outside of its normal tolerance—this could include either portions of or the entire mixing zone area, at times. As a worst-case assumption, MPC has estimated the area of potential impact under critical conditions, which would take the form of temporary avoidance, as the full extent of the regulatory mixing zone (i.e., 1.7 miles, or 5.5-6 acres). The actual area of potential impact at any given time is dependent upon environmental factors which are outside of Marathon’s control (e.g., weather, river flow conditions). Based on available data on Bigeye Chub occurrences in Robinson Creek within the area of expected MPC thermal influence, take (in the form of avoidance) would be up to three (3) individuals per year for the duration of the requested ITA duration.

Anticipated Impact of Excursion Hours Provision of ATELS

Provision 1b of the ATELS (outlined on pages 8-9 of this document) is designed to handle limited situations under which system upsets and/or extremely critical weather conditions result in the exceedance of the maximum thermal limits, despite best control efforts by the permittee. As such, the duration of the allowed excursion period (1% of the hours in any 12-month period), as well as magnitude of the allowed excursion (up to 3°F) is extremely limited. Under those circumstances, the ambient temperatures of Robinson Creek would already be elevated to the point that Bigeye Chub would have left the area to avoid temperatures that exceed their preferred range. This infrequent occurrence is factored into the high end of the take estimate range (i.e., up to 3 individuals/year) over the requested duration of the ITA (10 years).

MPC’s Thermal Discharge Effects and How They Relate to the Illinois Endangered Species Protection Act’s Definition of Take

The Illinois Endangered Species Protection Act (520 ILCS 10), enacted in 1972, prohibits take of any animal species listed as either endangered or threatened within the State of Illinois.

“Take” (in reference to animals and animal products) is defined by the Act as any action that will “harm, hunt, shoot, pursue, lure, wound, kill, destroy, harass, gig, spear, ensnare, trap, capture, collect [an endangered or threatened species], or an attempt to engage in such conduct” (520 ILCS 10/2).

As discussed above, take of Bigeye Chub as the result of the normal, on-going, and permitted operation of the Marathon Robinson Refinery would be in the form of “harassment” as manifested by conditions which would require Bigeye Chub to temporarily avoid areas of the

stream outside of their preferred temperature range. Temperatures discharged by the Marathon Robinson Refinery are not high enough to cause acute Bigeye Chub mortality, especially given the fact that such increased temperatures would occur over a sufficiently long period of time to allow Bigeye Chub to move into available thermal refugia either upstream or downstream of the immediate discharge and/or outside of the mixing zone area.

Bigeye Chub avoidance of Robinson Refinery's Outfall MPC 001 thermal discharge is possible but would not be permanent due to the inherent sensitivity of all fish species to changes in water temperature and ability to move to other areas with their preferred temperature range. The MPC 001 discharge temperature varies both temporally and seasonally, as discussed in the Marathon 316(a) Demonstration, which will serve to minimize both the magnitude and duration of any potential avoidance impacts/take.

Estimated Take Associated with Normal On-Going Operation of the MPC Robinson Refinery

In 2016, MBI collected three Bigeye Chub from Robinson Creek in the area between the MPC 001 discharge and confluence with Sugar Creek (Figure 3) (MBI 2017a). A fourth specimen was collected upstream of the MPC 001 outfall. Four additional specimens were found in Lamotte Creek but were outside of the expected area of thermal influence of the MPC 001 discharge.

Although there are no comprehensive monitoring programs for Bigeye Chub in the area, data records obtained from IDNR show that while Bigeye Chub abundance has generally increased in the Vermillion River and its tributaries, numbers remain small in Robinson, Raccoon, and Lamotte Creeks in Crawford County. This fact is supported by data IDNR has collected in Robinson Creek and connected watersheds since 2016. The most recent IDNR monitoring record for Robinson Creek was for July 12, 2019. Sampling was conducted, but no Bigeye Chub were found. Sampling in Raccoon Creek, conducted on June 7, 2021, yielded four Bigeye Chub, while sampling in Lamotte Creek on June 23, 2021, yielded two specimens. By comparison, locations on the Vermillion River and its tributaries sampled in 2020-2021 yielded from zero to 49 individual Bigeye Chub (occurrence records obtained from Tara Kieninger, IDNR, 18 July 2022).

In addition, a total of six (6) adult Bigeye Chub specimens were found during recent (October 2022) sampling conducted in Robinson Creek by MPC for another study—all of these were found well outside of the area of MPC's thermal discharge, approximately 3.9 miles downstream of Outfall 001 (occurrence records to be supplied to IDNR upon study completion).

Based on these observations, it is conservatively estimated that take associated with the MPC 001 thermal discharge could be up to three (3) Bigeye Chub, on an annual basis.

This estimated take would likely be in the form of intermittent disturbance or potential avoidance of areas in closer proximity to the MPC 001 discharge, including within the regulatory mixing zone that ends at the IL Route 1 Bridge.

Installation of Water Temperature Monitoring Equipment

As a requirement of the new NPDES Permit for the Robinson Refinery (Special Condition 8F), IEPA has granted a 16-month implementation schedule in order to install infrastructure for a continuous temperature recorder either at or upstream and near the IL Route 1 Bridge compliance point located approximately 1.7 miles downstream of MPC 001. MPC currently estimates that this monitoring station will be installed in Robinson Creek between Fall 2023 and Spring of 2024. (Figure 2; photolog). Although the majority of construction activity will be conducted on land, adjacent to Robinson Creek, two piles will be installed in the creek bed to anchor sensors and support an access platform for maintaining equipment. The creek installation footprint will be approximately 10 square feet or less, and it is anticipated that the in-stream portion of the work will take 4-5 days to complete. Other construction work taking place above the streambank and in the floodplain, such as installing the platform, monitoring equipment, power connections, walkways, and parking areas, could take up to three months to complete but would not include any in-stream work. As such, the period of physical disruption to Robinson Creek and Bigeye Chub is expected to be very brief and minimal. The activity may result in the temporary disturbance of creek bottom sediments and may result in the temporary avoidance of the areas by Bigeye Chub while the installation is being completed. **The total estimated area of disturbance is 0.002 acres.** A map providing the monitoring location and design information on the planned monitor installation is included as Exhibit 2 to this submittal. MPC had also initiated an EcoCAT consultation regarding this installation on November 21, 2022 (IDNR Project Number 2306849) and received a response dated January 3, 2023, concluding that adverse effects are unlikely (See Exhibit 3 to this submittal).

Estimated Take for Temperature Recorder Installation

Based on the number of Bigeye Chub observed in Robinson Creek from available studies (reviewed on page 12 above), the small area of activity associated with the water temperature monitoring station, and the brief period of disturbance, it is conservatively estimated that the installation of the water temperature monitoring equipment could result in the **take of up to one (1) Bigeye Chub**. This take would be in the form of temporary displacement or avoidance and not mortality, as discussed previously. This is expected to be a one-time occurrence during the installation process.

Estimated Take from On-Going Temperature Monitor Maintenance Activities

MPC expects that a majority of maintenance will occur from the shoreline or pier area. However, should there be a need to access Robinson Creek, MPC believes that the potential take from this activity is adequately covered under the prior take estimate for the initial installation (i.e., up to one (1) Bigeye Chub per year), with short-term avoidance being the form of take which would occur. All proper precautions and BMPs will be followed for any maintenance activities which will require creek access. It is not anticipated that any heavy equipment would be required to perform such maintenance. The installation is on an inside bend of the creek and is therefore not subject to excessive siltation or debris build-up.

2. Avoidance, Minimization, and Mitigation Measures

2A. Avoidance and Minimization

Temperature Monitor Installation

The area of Robinson Creek potentially affected by the installation of the temperature monitor will be kept as small as reasonably possible in order to minimize any temporary impacts to the stream habitat or inhabitants. MPC intends to conduct the temperature monitoring installation during stable low-flow periods to minimize disturbance. Further, although it is unknown if Bigeye Chub spawns in Robinson Creek, MPC will conduct the installation outside of May - June to avoid the spawning season for Bigeye Chub in Illinois. To minimize the area affected by the project, a minimal footprint in the stream and along the shoreline will be maintained during the installation activity. (Maximum area of disturbance: 0.002 acres). The stream location will be visually inspected prior to entry of personnel or equipment to ensure that no aquatic life is in the immediate vicinity. The stream bank will be stabilized, as necessary, to protect the area from possible erosion. Once the installation is complete, on-going operation of the temperature monitor is not expected to have any impact on the aquatic life in Robinson Creek. Any required future maintenance activities (e.g., debris removal or sensor location adjustment, calibration, or replacement) are expected to be conducted from the shoreline or access platform to the extent possible. Any required instream work will implement the same BMPs as the original installation process.

On-Going Thermal Discharge

While the thermal tolerance information provided above, along with the existing MPC 001 temperature data record does not indicate any type of chronic impact, MPC acknowledges that discharge temperatures associated with the MPC 001 outfall may affect conditions that result in

Bigeye Chub avoiding a portion of Robinson Creek within the thermal mixing zone for part of the year, particularly if flow and/or weather conditions are more adverse. MPC will monitor the downstream compliance temperatures closely to ensure that all criteria required by the ATELS continue to be met.

Based on existing temperature records, the MPC 001 discharge will be below potential avoidance temperatures identified by Dai and Suski (2019) much of the time. Data collected to support the calibration and validation of the thermal model used in the 316(a) predictive analysis showed that the 95th percentile temperatures within the mixing zone remained below Bigeye Chub avoidance levels (TetraTech 2017—Tables 4.2 and 4.3). Therefore, potential adverse effects/take would most likely be limited to the warmest periods of the year. Based on the information provided in the MPC 316(a) Demonstration, discharge temperatures that may result in Bigeye Chub avoidance behavior are most likely to occur in July and August, outside the typical late spring and early summer spawning season.⁷ **Therefore, MPC does not believe that there would be any adverse impacts to Bigeye Chub eggs or fry.**

Any thermal effects will be limited to the mixing zone, but within this area, a gradient of water temperatures will also exist at any given time. Exposure to avoidance temperatures may have adverse effects on fish species only if exposure occurs long-term, i.e., weeks or months. However, the data provided in the ATEL case showed that any exposure to avoidance temperature will be short-term (hours or days). Results provided in the 316(a) Demonstration show that the maximum number of consecutive hours within the mixing zone at RC05 (0.1 miles downstream of Outfall 001) that exceeded the maximum stress threshold of 90.7°F without a recovery period was only 14.5 hours based on the 2016 HOBO results, and only 7.0 hours based on the Environmental Fluid Dynamics Code (EFDC) modeling. (Recovery periods are those times when the water temperature is less than 87.1°F). The maximum summer temperature for any location downstream of MPC 001, including RC05, from the modeling effort was 94.7°F, which is below the Bigeye Chub loss of equilibrium temperature (Exhibit 4 of Board Case).

To summarize, MBI found “[t]he duration and severity of thermal stress periods greater than the 90.7°F Representative Important Species (RIS) short-term survival (or maximum criterion) and stress recovery periods less than the 87.1°F RIS long term survival (or summer average criterion) in hours were determined... There were a total of eight thermal stress periods of 1.5 to 14.5 hours in duration for a total of 74.4 hours over the summer or 3.4% of the time. Each was followed by one or two stress recovery periods for a total of 779.3 hours or 36.1% of the time for a summer period recovery to stress ratio of 10.5:1... The longest thermal stress period

⁷ Discussed in IPCB Order, 4/7/2022, p. 45

of 14.5 hours occurred on August 10 and was followed by a 12.2-hour stress period on August 12, and a shorter period on August 13 (1.5 hrs.).” Exh. 4 at 18-19. MBI concluded, “[e]xceedances of the FTMS short-term threshold of 90.7°F are brief and sufficiently offset by lower temperatures that provide for adequate recovery periods.” Exh. 4 at 3.

In summary, recovery periods in between periods of higher discharge temperatures will continue to exist and will serve to limit overall take. Since water temperatures within the mixing zone would increase gradually, loss of equilibrium temperatures should have little adverse effect because Bigeye Chub would already have moved from the area of higher temperature.

MPC is committed to ensuring continuing thermal compliance by making efforts to limit the thermal discharge to the smallest spatial extent possible, maintaining its thermal discharge at or below the maximum temperature at the compliance point, and ensuring an average compliance temperature of 87°F for the summer period. All of these measures should ensure that there are sufficient recovery periods within the thermal mixing zone to limit potential take.

2B. Management

The proposed design and installation of the water temperature monitoring station in Robinson Creek has been developed in part to minimize activity and potential disturbance within the waterway. To further manage potential effects on Robinson Creek and Bigeye Chub, Best Management Practices (BMP) will be employed with upland/terrestrial staging and installation activities adjacent to Robinson Creek. MPC is developing a spill and emergency response plan for both the construction and on-going maintenance of the temperature equipment site. This plan will be provided to the contractors prior to construction and will be required to be followed to avoid any unanticipated releases of oil from excavation/earth moving equipment.

The thermal discharge from MPC 001 as the result of normal refinery operations will continue to be closely monitored by MPC personnel to ensure compliance with the ATELS, as well as all other applicable NPDES permit requirements, thereby assuring that limited take will occur as the result of the on-going legal operation of the facility.

For both the one-time temperature monitoring equipment installation, as well as the normal on-going operation of the MPC Robinson Refinery, the information provided within the ATEL Demonstration and summarized in this submittal demonstrates that any potential take associated with these two MPC activities **will not reduce the likelihood of Bigeye Chub survival in Illinois, the biotic community of which Bigeye Chub is a part, or the habitat essential to the Bigeye Chub’s existence in the state.**

2C. Mitigation

MPC will implement Best Management Practices (BMPs) to ensure minimal disturbance to Robinson Creek habitat and aquatic life during the installation of required temperature monitoring equipment.

In order to mitigate against any potentially adverse impacts of the thermal discharge, which is part of normal refinery operations, MPC will continue to uphold its commitment to abide by all the requirements of the facility NPDES Permit, including adherence to the ATEs, taking actions, as necessary, to assure that maximum temperatures are not exceeded and that the aquatic life in Robinson Creek, including but not limited to Bigeye Chub, continues to be adequately protected.

MPC will provide a one-time contribution (not to exceed \$20,800.00) to the IDNR Wildlife Conservation Fund, or similar cause that will further promote the protection of Bigeye Chub, and/or enhance habitat conditions for this species, as well as other species with similar habitat and water quality preferences.

2D. Monitoring

MPC will install a water temperature monitoring station in Robinson Creek as required by the new NPDES Permit and described above. These data will be used to demonstrate continuing compliance of Outfall MPC 001 with the ATEL limits as part of the Robinson Refinery NPDES permit commitments. Since the in-stream portion of the installation will take only approximately 4-5 days to complete, any potential impact to the aquatic life in Robinson Creek is expected to be minimal. Standard Best Management Practices (BMPs) will be employed by the installation contractor to ensure minimal disturbance of the stream and adjacent shoreline. The area will be checked immediately before and after work has been completed to ensure biological organisms are not present and that siltation and other disturbances will be kept to a minimum.

Regarding the normal on-going operation of the Robinson Refinery, as shown in the approved 316(a) Demonstration and discussed above, adherence to the ATEs should result in adequate protection of the balanced indigenous community of Robinson Creek, including the Bigeye Chub. Therefore, no additional biological monitoring has been required as part of the new NPDES Permit.

However, in order to provide additional data during the ITA's duration, MPC will conduct a fisheries stream survey during the summer period in years 2, 5, and 7 of the ITA duration.

Electrofishing and seining will be performed at three monitoring locations within the MPC thermal mixing zone during July or August (See Figures 4a-4c). Sampling will include the same two locations at which Bigeye Chub were found near MPC 001 during the 2016 monitoring effort, as well as a downstream location. These locations were selected because they all have similar available habitat. Ancillary measurements of water temperature, dissolved oxygen and conductivity will be performed at each location immediately before each sampling event. A qualitative habitat assessment will also be performed concurrent with the fisheries survey. In-stream continuous water temperature monitoring will also be conducted at one location within the thermal mixing zone concurrent with the fisheries survey period. The cost of this effort shall not exceed \$28,000 per sampling year. The results of this survey will provide further information on the presence of Bigeye Chub and other species in the vicinity of the MPC thermal discharge under the approved ATELS. Results will be summarized in a letter report that will be provided to IDNR within 90 days after the field work is completed.

2E. Adaptive Management

The temperature monitor installation will be overseen by MPC Environmental personnel to ensure that all work is done in a manner to avoid potential stream impacts. Any inadequacies will be immediately handled by the implementation of additional controls to prevent siltation or other physical disturbances to the stream and/or shoreline, with work stoppage until such controls are in place. A spill prevention and control procedure is being developed by MPC for contractor use to limit unanticipated releases of oil from heavy equipment. Flooding impacts are not anticipated but will be pro-actively managed through MPC's on-going surveillance and maintenance of the temperature monitoring site. No materials will be stored on-site that could have any negative impacts on the creek.

The take estimates in this Conservation Plan were developed based on available data and with the knowledge that adherence to the ATELS should remain protective of the Bigeye Chub in Robinson Creek. MPC will maintain continuous temperature monitoring of Robinson Creek to ensure that all temperature limits are met. MPC is committed to maintaining compliance with all of its NPDES permit requirements and will take appropriate actions to ensure that operating conditions will meet its compliance objectives. Potential temperature exceedances, although not expected, will be immediately addressed through the implementation of appropriate measures depending on the specific situation. Any chronic exceedances of the applicable thermal limits will result in the need to re-evaluate the ATELS as part of the next NPDES renewal cycle.

2F. Funding Verification

Operations at the Robinson Refinery are funded by MPC. As such, MPC will fully incorporate the commitments discussed in this Conservation Plan into its operation activities and has the necessary funds to do so. As described below, the Robinson Refinery has been in operation for many years, has strong ties to the community, and is committed to permit compliance and the minimization of environmental impacts.

3. Alternative Actions

3A. Discontinue Existing Discharge / Shut Down of Plant Operations

One alternative consists of discontinuing the current MPC 001 discharge. This is not the preferred alternative for several important reasons. Discontinuing the current discharge and shutting down the facility would result in the loss of important social and economic benefits for the community. MPC contributes valuable jobs for community members from Robinson and the surrounding areas. It has been a part of the community for over a century and supplies quality transportation fuels and associated products from approximately 270,200 barrels/day. MPC Robinson Refinery employs approximately 387 full-time and part-time staff and about 470 contractors. The Robinson Refinery is the primary taxpayer in the City of Robinson. Additional benefits provided to the surrounding community include participation in the following local organizations and causes:

- Chambers of Commerce
- Community Advisory Panel
- Community Electronics Takeback Day
- Community Household Hazardous Waste Day
- Education programs at Certified Wildlife Habitat sites in Crawford County
- Emergency response drills with local emergency responders
- Harmony Park
- Leadership Crawford County
- Mutual aid for fire and other emergencies
- Nutrition on Weekends
- United Way of Crawford County
- University of Illinois Conservation Day

MPC is committed to our community. The Robinson Refinery maintains 169 acres of certified wildlife habitat sites at four separate locations. Improvements are continually made to these habitats to promote wildlife and community use. These sites have received various recognitions

for enhancements to the native habitats, including the 2019 and 2015 Monarch Sustainer of the Year Award from the Pollinator Partnership and the 2018 Wildlife Habitat Council Grasslands Project Award. Each year the Robinson Refinery hosts nature days for community schools at our wildlife habitats, where hundreds of school children visit various educational and fun stations to learn about the nature around them. The Robinson Refinery also focuses on environmental stewardship for the community. MPC hosts Household Hazardous Waste and Electronics Take Back Day for the community of Robinson. The community turns out in huge numbers for these events, with traffic for the event often stretching several blocks. Tons of hazardous waste and hundreds of electronics are responsibly disposed of through these events.

MPC is also committed to environmental stewardship through innovation and efficiency that results in conservation. For example, an audit of the crude oil and ultraformer units helped quantify the benefits of a healthy insulation program. Insulation improvements reduced energy consumption by nearly 100 billion BTU per year, reducing CO₂ emissions by over 5,000 metric tons per year. In 2021, the Robinson Refinery was awarded the EPA's Energy Star Certification for the fourth consecutive year and seventh year overall.

If the MPC 001 discharge is discontinued, the facility could no longer operate and therefore MPC would not be able to provide the fuels and associated products that help move this country, contribute to area needs, or provide other social and economic benefits. The total amount of flow in Robinson Creek would also be decreased, which could have detrimental impacts during low flow times of the year.⁸ As such, this is not the preferred alternative, nor should it be necessary to continue to ensure the adequate protection of the aquatic life in Robinson Creek based on the 316(a) Demonstration outcome.

3B. Move Existing Outfall to Wabash River

The existing outfall travels approximately 1.1 miles in an underground conduit in order to reach the current MPC 001 outfall point. While relocation of this existing discharge to a larger waterway would result in more rapid mixing and therefore less overall thermal influence, this is not a practical or feasible alternative from several perspectives. The amount of land disturbance necessary to install an extended (7 miles or more, depending on route) buried pipeline from the Robinson Refinery, through various private and publicly-owned properties, as well as the overall costs and time for design, permitting, and implementation, are wholly disproportionate to off-set the minimal level of potential non-lethal take (i.e., avoidance) associated with the current thermal discharge configuration and location. This is therefore not a preferred alternative.

⁸ The Robinson Refinery discharges to Robinson Creek at a point where 1.4 cfs of flow exists upstream of the outfall during critical 7Q10 low-flow conditions. The 7Q10 flow is 0 cfs in Robinson Creek upstream of the Robinson POTW. Robinson Creek also receives water from ephemeral stream channels and ditches from the agricultural lands (IPCB 18-49 Board Order dated April 7, 2022—p. 10).

3C. On-going Long-Term Evaluation of Existing Discharge

Specific alternative actions for decreases in thermal load from the Robinson Refinery at MPC 001 have not been evaluated, particularly in light of the approval of the ATEs under existing operating conditions. However, MPC remains committed to environmental stewardship and continuous improvement in all of its endeavors and will continue to assess its operations to ensure that they remain as efficient and environmentally benign as possible. MPC is committed to remaining in compliance with applicable thermal discharge limitations, as determined by its NPDES Permit. Further, 35 Ill. Adm. Code; Section 106, Subpart K requires that alternative thermal effluent limits be re-evaluated with each NPDES permit renewal. As such, MPC is obligated to re-examine the effects of their alternative thermal effluent approximately every five (5) years.

Option 3C is therefore MPC's preferred alternative.⁹

4. Continued Species Viability

In Illinois, previous records for the Bigeye Chub are known from the upper reaches of Wabash River tributaries, i.e., Little Wabash, Embarras, and Vermilion rivers (Warren and Burr 1988). Prior to 1960, the Bigeye Chub was widespread and collected at 40 sites across six drainages throughout South Central and Eastern Illinois (Sherwood and Wylie 2015). The last collection of Bigeye Chub from the Salt Fork, a tributary of the Vermilion River, was in 1961 (Smith 1979).

The decline of the Bigeye Chub in the 1970s and 1980s was drastic and the species was thought to be extirpated from Illinois (Smith 1979). Smith (1979) cited increasing turbidity and waterway impoundments as significant factors contributing to the extirpation of the Bigeye Chub in Illinois and others have arrived at a similar conclusion (Page and Burr 2011). A single Bigeye Chub was recorded from the Wabash River, along the Indiana-Illinois border adjacent to Clark County, Illinois in 1977 (Warren and Brooks 1988; Sherwood and Wylie 2015). During the summers of 1986 and 1987, Warren and Burr (1988) were unable to locate viable populations of the Bigeye Chub at or near 20 historical sites in the Wabash River drainage, with concentrated efforts in the Vermilion River system and one site in the Kaskaskia River. In 1992, stream biologists from the Illinois Department of Conservation recorded a single, adult

⁹ With regard to the in-stream temperature monitoring installation, since this is an NPDES permit requirement, and there are no viable options that will allow for accurate year-round application at the specified location, consideration of other alternatives have not been considered here.

Bigeye Chub from the Little Vermilion River, which represented the first collection of the species from an Illinois waterbody in over 30 years (Burr et al. 1996). The next reported collection of Bigeye Chub in Illinois was 2004 when Tiemann et al. (2004) collected one specimen from Little Beaver Creek, Kankakee County, Illinois on 2 May 2004, which represented a range expansion into a new river drainage. The collection site on Little Beaver Creek had clear, shallow, still water with a firm, sandy bottom under an enclosed canopy surrounded by agricultural fields and intermixed forests (Tiemann et al. 2004). Tiemann et al. (2004) suggested the Bigeye Chub range expansion might have occurred during high water periods from either the Tippecanoe River or Wabash River drainages, which are a part of the same drainage.

The first evidence of a considerable resurgence of Bigeye Chub in Illinois was documented by Sherwood and Wylie (2015). In 2011, an intensive survey of the Vermilion River collected a healthy population of 315 Bigeye Chub individuals, of multiple year classes, from six sites in the Vermilion River basin (Sherwood and Wylie 2015). In addition, Sherwood and Wylie (2015) created a historic Bigeye Chub distribution model for Illinois that confirmed the locations of past collections from northern parts of the Kaskaskia, Embarras, and Little Wabash River basins, plus the entire Vermilion, Little Vermilion, and Broilers Creek basins. Robinson Creek is located immediately adjacent to the area modeled by Sherwood and Wylie (2015).

The 2016 collection of specimens from Robinson Creek was likely due to the continued expansion of Bigeye Chub into the Wabash River drainage via the mainstem of the Wabash River (Sherwood and Wylie 2015; MBI 2018). Sherwood and Wylie (2015) also suggest that in addition to Bigeye Chub dispersing to smaller streams through the Wabash River, small populations of individuals remained within Illinois basins where Bigeye Chub has reappeared. In order to obtain test organisms for the IDNR-sponsored thermal bioassay discussed previously, a total of 40 Bigeye Chub were collected in the Middle Fork of the Vermilion River from two separate sampling efforts in October 2018 (Dai and Suski 2019). This many specimens found with a limited effort shows that Bigeye Chub are in fact more common in Illinois waters than previously thought.

While there have been no comprehensive monitoring efforts to document the presence of Bigeye Chub in the area near the MPC Robinson Refinery over the years, available records obtained from IDNR for Bigeye Chub in Crawford and surrounding counties in the southeastern part of the state show that higher numbers of species have been found in recent years, particularly in streams with more favorable habitat characteristics, such as the Vermilion River and its tributaries. The most recent documented monitoring efforts in 2020 and 2021 have yielded up to 25 fish at a single location in the Vermilion River. While the Bigeye Chub continues to be found in Robinson, Raccoon, and Lamotte Creeks in Crawford County, its

numbers remain low (0-6 fish), depending upon location (Tara Kieninger, IDNR personal communication, 18 July 2022, and EA personal communication, 9 January 2023).

The present literature about and recent collections of Bigeye Chub in Illinois suggests that adequate habitat and water quality are available for the species to recover in its former range and expand (Tiemann 2004; MBI 2018). The recent increase in Bigeye Chub presence in Illinois is an indicator that conditions of Illinois waterways have much improved since the 1960s, and their occurrence in Robinson Creek confirms their resilience.

Therefore, the continued operation of the MPC Robinson Refinery will not reduce the likelihood of the survival of the Bigeye Chub in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois.

5. Implementing Agreement

In order to ensure compliance with the conditions described in the Incidental Take Authorization for Bigeye Chub, MPC agrees to implement the measures described in the Conservation Plan. Such measures include:


- Implementation of Best Management Practices (BMPs) to ensure minimal disturbance to Robinson Creek habitat and aquatic life during the installation of required temperature monitoring equipment, as well as its on-going maintenance.
- A continued commitment by MPC to abide by all the requirements of the facility NPDES Permit, including adherence to the ATELS, taking actions, as necessary, to assure that maximum temperatures are not exceeded and the aquatic life in Robinson Creek, including but not limited to Bigeye Chub, continues to be adequately protected.
- MPC will conduct a stream fisheries survey during years 2, 5, and 7 of the ITA term. Electrofishing and seining will be performed at three monitoring locations in Robinson Creek during July or August. Electrofishing and seining will be conducted at the 2016 locations RC04, RC05, and RC09 (Figure 3), which are the same as the three locations surveyed in 2022 (Figures 4a, 4b, and 4c). As such, sampling will include the same locations where Bigeye Chub were found near MPC 001 during the 2016 and 2022 surveys. Ancillary measurements of water temperature, dissolved oxygen and conductivity will be performed at each location immediately before each sampling event. A qualitative habitat assessment will also be performed concurrent with the fisheries survey. In-stream continuous water temperature monitoring will also be

conducted at one location within the thermal mixing zone concurrent with each fisheries survey period. The cost of this effort shall not exceed \$28,000 per sampling year. The results of this survey will provide further information on the presence of Bigeye Chub and other species in the vicinity of the MPC thermal discharge under the approved ATELS. Results will be summarized in a letter report that will be provided to IDNR within 90 days after the field work is completed.

- MPC will provide a one-time contribution (not to exceed \$20,800.00) during the term of the ITA to the IDNR Wildlife Conservation Fund, or similar cause that will further promote the protection of Bigeye Chub and/or enhance habitat conditions for this species, as well as other species with similar habitat and water quality preferences.

The participant hereby certifies that they have the legal authority to carry out obligations and responsibilities of the Conservation Plan.

Marathon Petroleum Company LP

Signed:  _____
Darin J. Barber

Dated: 3/7/2023

Robinson Refinery Environmental, Safety & Security Manager

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- Yoder, C. 2008. Challenges with modernizing a temperature criteria derivation methodology: The fish temperature modeling system. In Robert Goldstein and Christine Lewis, eds. *Proceedings of the Second Thermal Ecology and Regulation Workshop* (pp. 1-1 to 1-19). Electric Power Research Institute. Palo Alto, California.

FIGURES

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Figure 1. Location of MPC Robinson Refinery

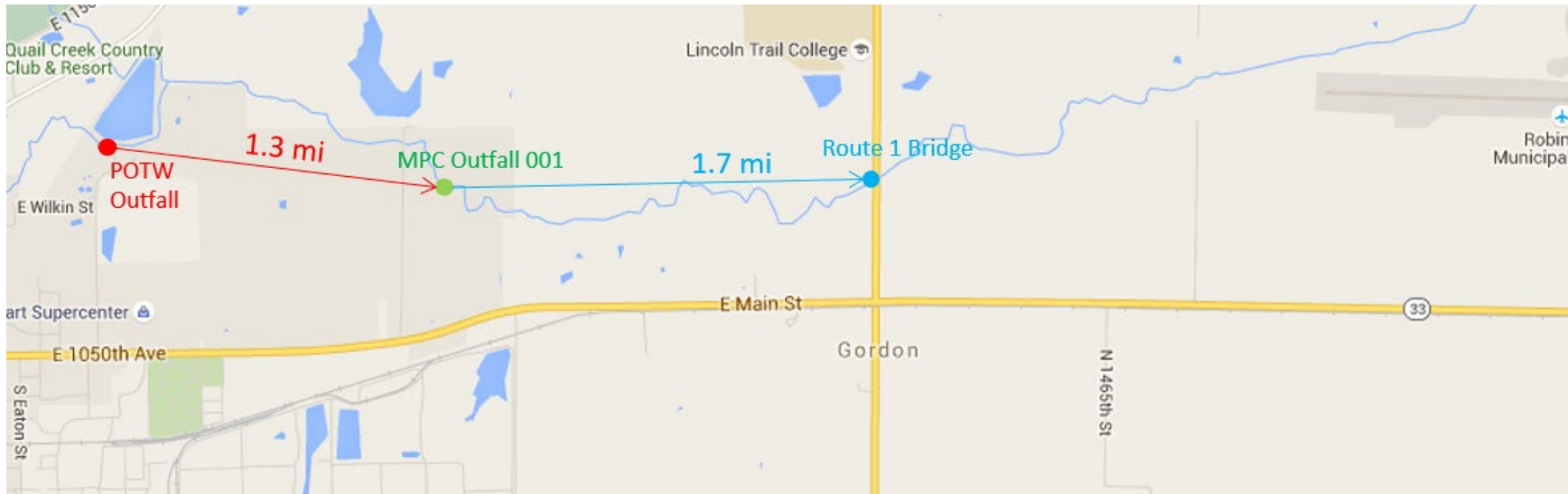


Figure 2. Location of MPC Outfall 001 in Relation to Compliance Monitoring Point at Route 1 Bridge

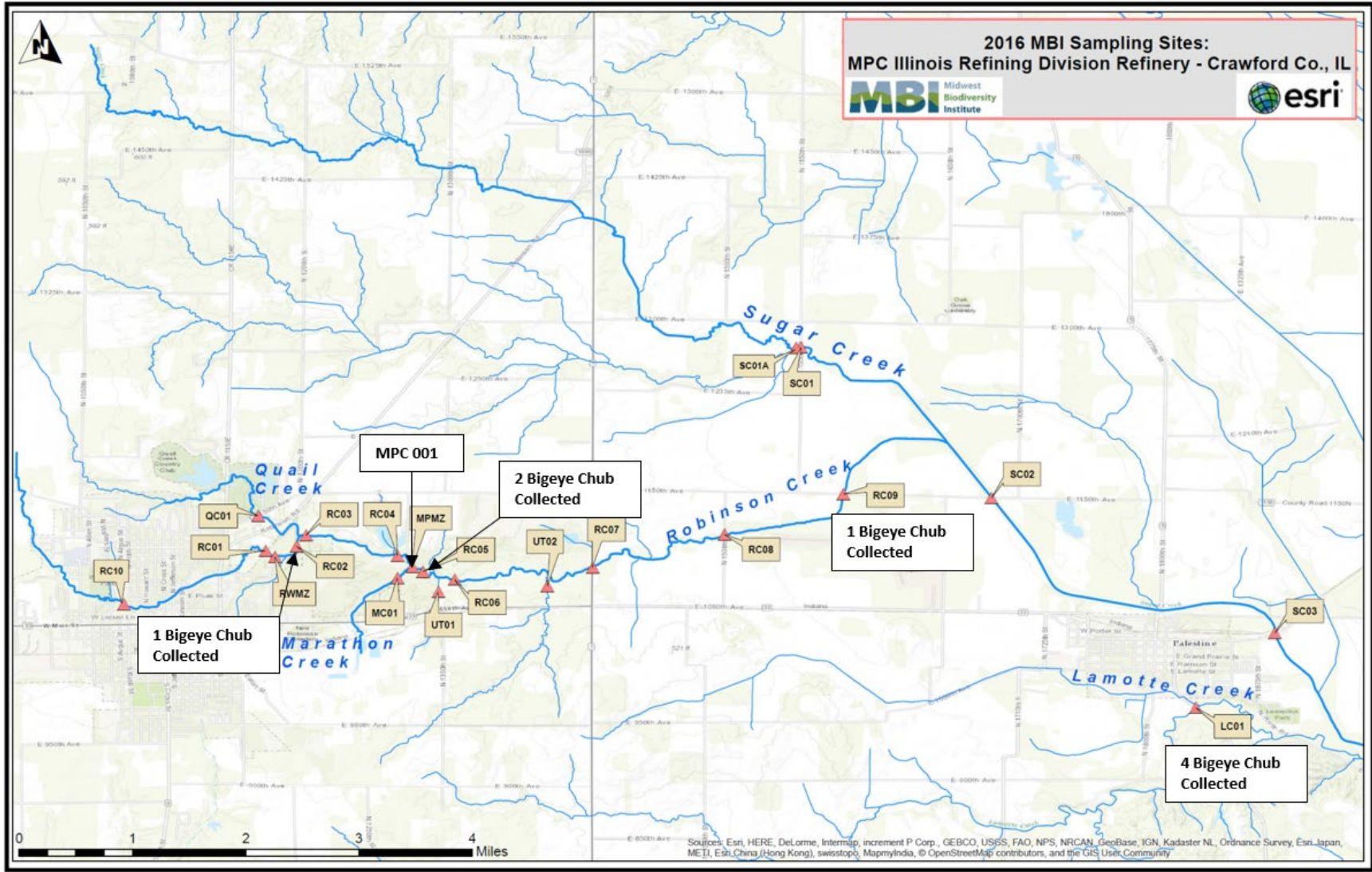


Figure 3. Locations Where Bigeye Chub Were Found in 2016 (from MBI 2017a)



Figure 4a. Fish Monitoring Locations for ITA

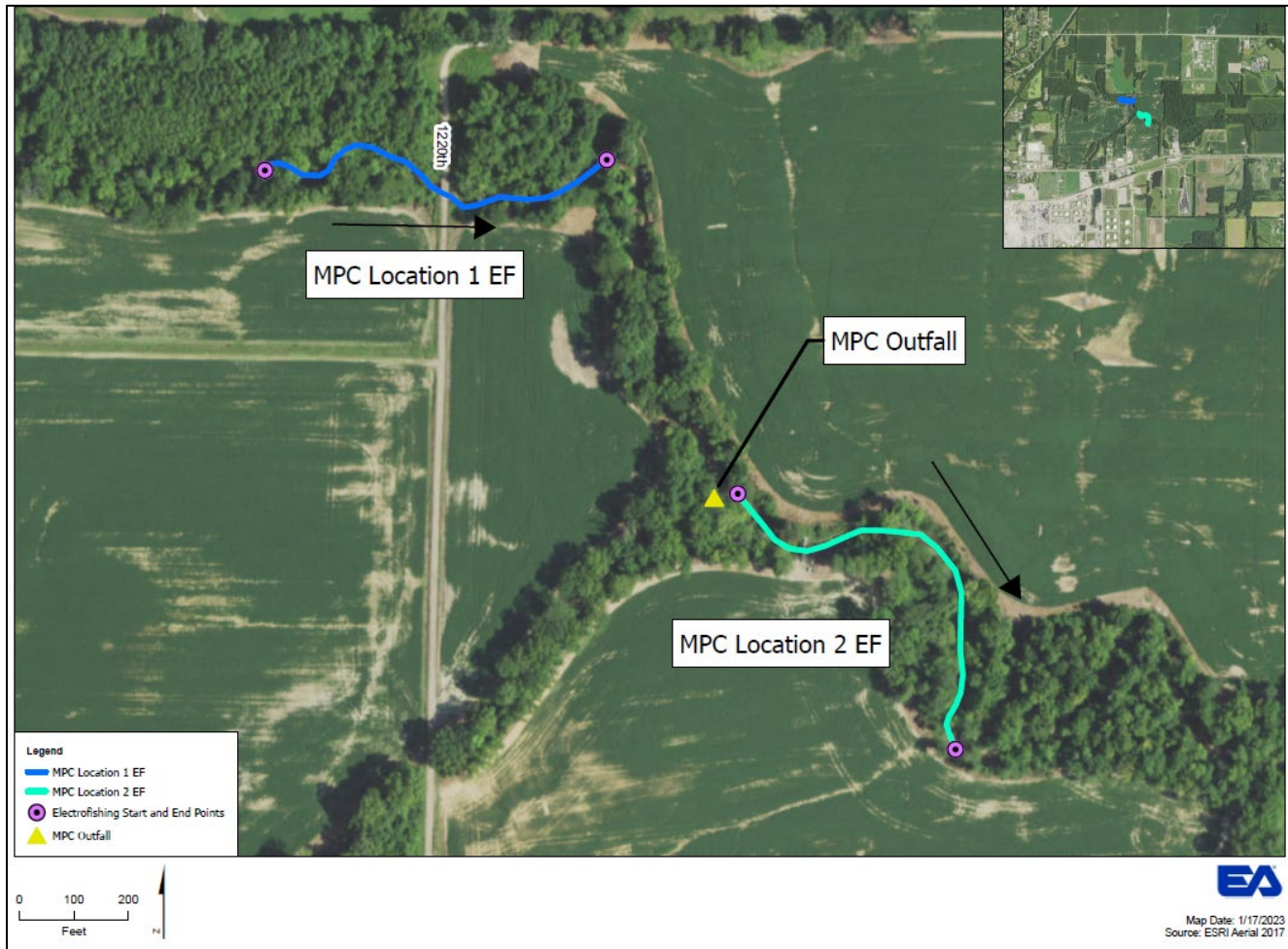


Figure 4b. Sample Locations 1 and 2—Robinson Creek

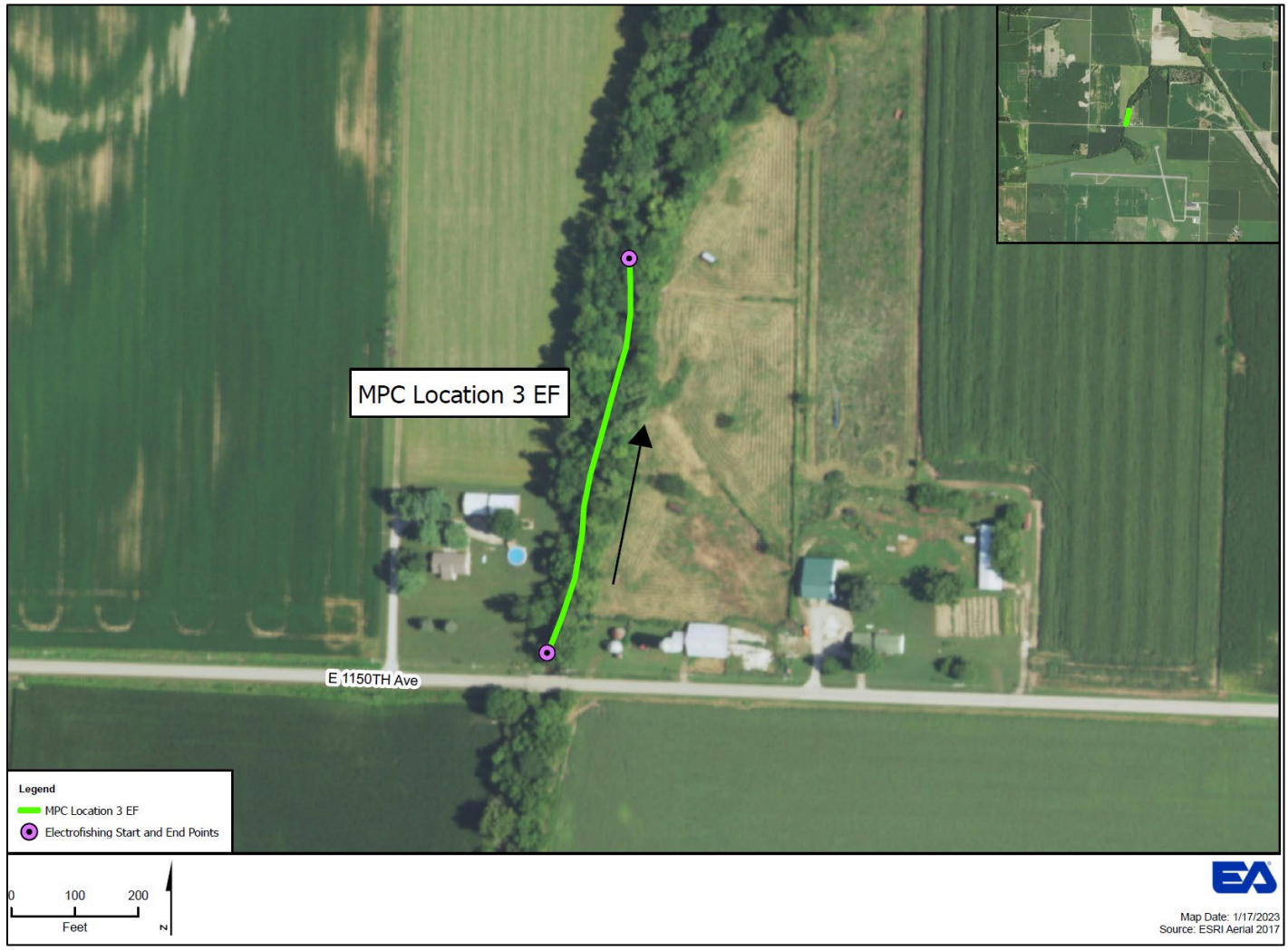


Figure 4c. Sample Location 3—Robinson Creek

PHOTOLOG

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MPC Outfall 001—Robinson Creek



Directly downstream from MPC 001—looking upstream



Upstream of Robinson WWTP Discharge—looking upstream



Upstream of MPC Outfall 001—looking upstream



Temperature Monitoring Location at Route 1 Bridge—looking upstream



Temperature Monitoring Location at Route 1 Bridge—looking upstream

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Exhibit 1

**7 April 2022 Board Order in PCB 2018-049
Marathon 316(a) Demonstration**

Found at the following link:

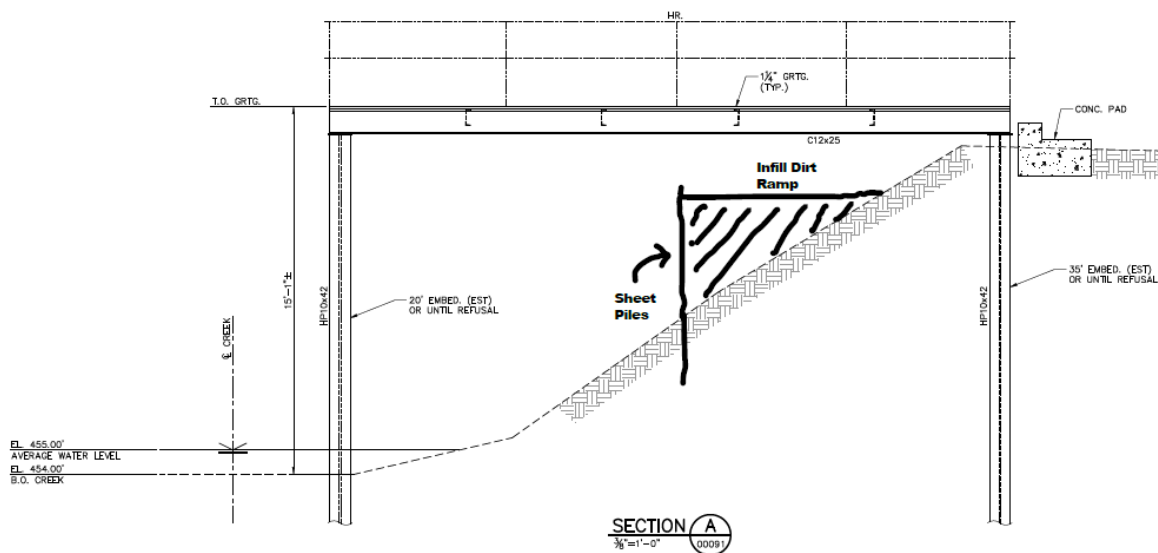
<https://pcb.illinois.gov/Cases/GetCaseDetailsById?caseId=15530>

Exhibit 2
Water Temperature Monitoring Equipment
Installation

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**Temperature Monitor to be installed at/near Route 1 Bridge over
Robinson Creek in Robinson, Illinois**

- The installation will include four steel 12-inch x 12-inch H-piles (two in the creek bed and two on the bank) and a platform that extends out from the streambank over Robinson Creek. The platform will provide protection for the temperature sensors as well as safe access to the water surface for manual measurements, if needed.
- Driving the piles will be the only disturbance of creek bed sediments under the current plan (estimated total depth of 25 ft); total estimated zone of stream disturbance: 10 sq. ft.
- The driving of the H-piles will require the construction of a temporary dirt ramp on the streambank for pile-driving equipment access. The in-stream disturbance duration will be approximately 4-5 days (three or four days to install sheet piling and dirt and drive the two H-piles; one day to remove dirt and sheet piling).
- The temporary dirt ramp on the streambank will require approximately 55 cu yards of fill. It will be roughly 7 feet deep (deepest part of slope), 14 feet long and 10 feet wide. The 14 feet will be from edge of bank to the sheet piling. None of this is expected to enter or affect the stream itself.



- Three months is the total installation time estimate for the platform and all the equipment, but once piles are drilled, there should be no more stream bed disturbance.
- The area around the temporary ramp installation will be visually inspected before and during construction to ensure no fish or other organisms are present or will be impacted.

- The streambank will be stabilized and returned to its pre-disturbance condition after the piles are driven.
- Shoreline will be lined with riprap in immediate vicinity of installation under platform structure.
- BMPs will be implemented to ensure minimal disturbance to the waterway before, during and after installation.

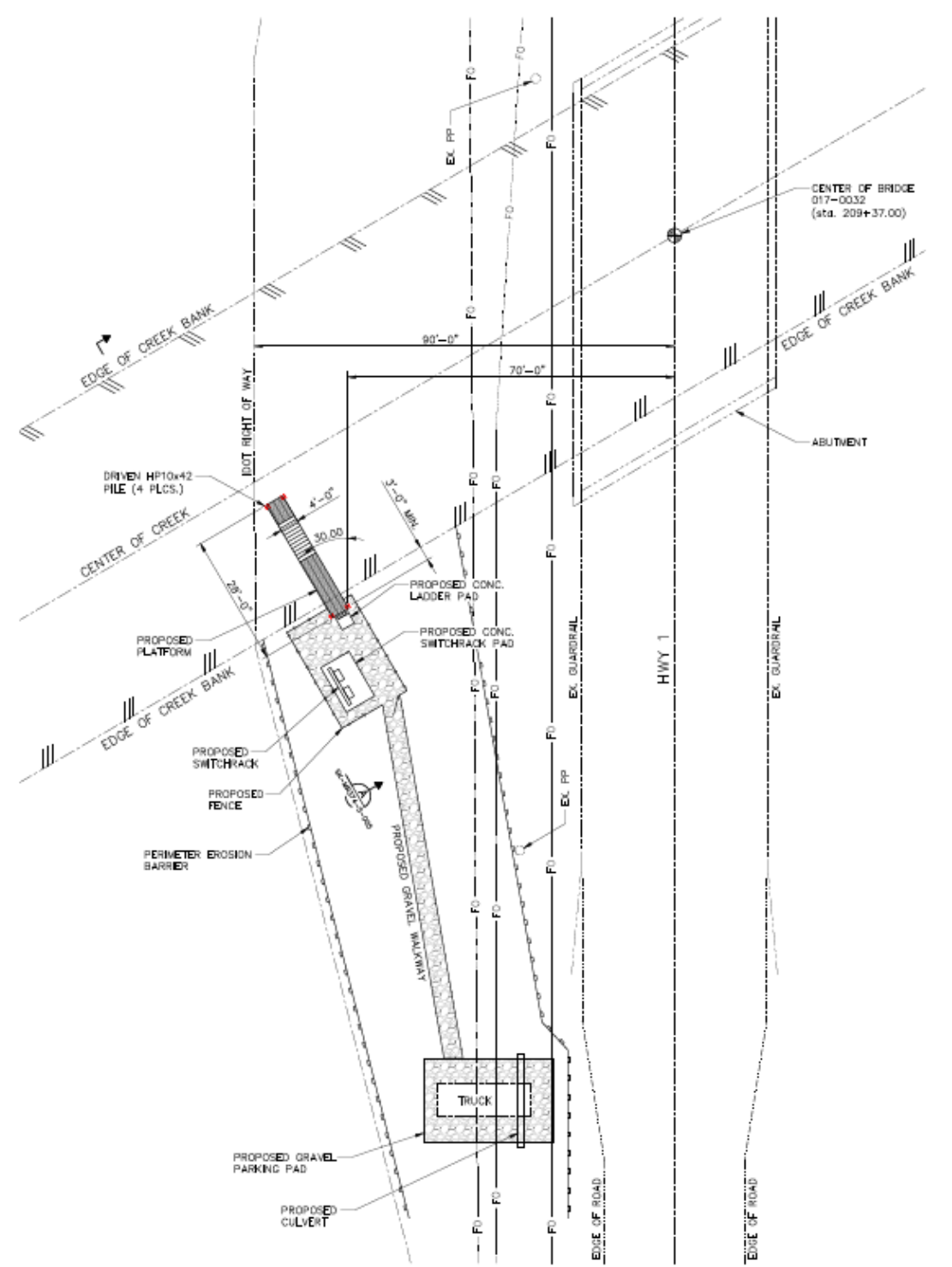
Location of Temperature Monitoring Installation:



Rough Visual of Planned Final Installation:



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SITE PLAN
3/21/23

GENERAL NOTES

- CONSTRUCTION PLAN**
1. INSTALL PERIMETER EROSION BARRIER.
 2. INSTALL FOUR (4) DRIVEN H-PILES.
 3. ATTACH STRUCTURAL STEEL PLATFORM TO H-PILES.
 4. EXCAVATE, FORM AND POUR CONCRETE FOR LADDER PAD AND SWITCHRACK PAD. BACKFILL AS NEEDED.
 5. EXCAVATE AND INSTALL CULVERT AT PARKING PAD. BACKFILL AS NEEDED.
 6. INSTALL GRAVEL PARKING PAD AND WALKWAY.
 7. INSTALL PERIMETER FENCING.
 8. REMOVE PERIMETER EROSION BARRIER.

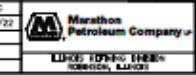
KEY PLAN



IN PROGRESS
DO NOT USE FOR
CONSTRUCTION
LAST SAVE: 08/19/23 10:07pm
By: daniel clowers

NO.	DATE	REVISIONS	ISSUED BY	DATE	NO.	DATE	REVISIONS	ISSUED BY	DATE	NO.	DATE	REVISIONS	ISSUED BY	DATE	NO.	DATE	REVISIONS	ISSUED BY	DATE
1	08/19/23	ISSUE FOR CONSTRUCTION	DL	08/19/23	1	08/19/23	ISSUE FOR CONSTRUCTION	DL	08/19/23	1	08/19/23	ISSUE FOR CONSTRUCTION	DL	08/19/23	1	08/19/23	ISSUE FOR CONSTRUCTION	DL	08/19/23

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
08/19/23	DL	ISSUE FOR CONSTRUCTION			



CREEK TEMPERATURE MONITORING
TEMPERATURE SENSOR SWITCHRACK
LOCATION & SITE PLAN
DRAWING NUMBER: SK-MR374-S-004

Exhibit 3

EcoCAT Correspondence Regarding Water Temperature Monitoring Equipment Installation

Applicant: Marathon Petroleum Company LP
Contact: Julie Holscher
Address: 100 Marathon Avenue
 Robinson, IL 62454

IDNR Project Number: 2306849
Date: 11/21/2022

Project: Creek Temperature Monitoring Equipment
Address: 100 Marathon Avenue, Robinson

Description: The Marathon Petroleum Company LP (MPC) Robinson Refinery will be installing continuous temperature monitoring equipment in Robinson Creek upstream and near the Route 1 Bridge to comply with new NPDES permit requirements. The installation will include four steel 12-inch x 12-inch H-piles (two in the creek bed and two on the bank) and a platform that extends out from the streambank over Robinson Creek. The platform will provide protection for the temperature sensors as well as safe access to the water surface for manual measurements, if needed. The driving of the H-piles will require the construction of a temporary dirt ramp on the streambank for pile-driving equipment access. The in-stream disturbance duration will be approximately 4-5 days. Best management practices will be implemented to minimize disturbance to the waterway before, during, and after installation. The area around the temporary ramp installation will be visually inspected before and during construction to ensure no fish or other organisms are present or will be impacted. The streambank will be stabilized and returned to its pre-disturbance condition after the piles are driven. An Incidental Take Authorization (ITA) is being pursued for the project, as well as joint permitting with USACE, IDNR, and IEPA. The project will take place within the Route 1 right-of-way, which also requires permitting with IDOT.

Natural Resource Review Results

Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Bigeye Chub (*Hybopsis amblops*)

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Crawford

Township, Range, Section:
 7N, 11W, 31



IL Department of Natural Resources Contact
 Bradley Hayes
 217-785-5500
 Division of Ecosystems & Environment

Government Jurisdiction
 IL Department of Natural Resources
 Unknown
 One Natural Resources Way
 Springfield, Illinois 62702

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

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1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.
2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.
3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

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Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

JB Pritzker, Governor
Colleen Callahan, Director

January 03, 2023

Julie Holscher
Marathon Petroleum Company LP
100 Marathon Avenue
Robinson, IL 62454

RE: Creek Temperature Monitoring Equipment
Project Number(s): 2306849
County: Crawford

Dear Applicant:

This letter is in reference to the project you recently submitted for consultation. The natural resource review provided by EcoCAT identified protected resources that may be in the vicinity of the proposed action. The Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation under 17 Ill. Adm. Code Part 1075 is terminated.

However, the applicant must follow the commitments finalized in pending ITA #254. Work should not begin before the ITA is finalized.

This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Bradley Hayes
Division of Ecosystems and Environment
217-785-5500