BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the Matter Of:	)	
	)	
MARATHON PETROLEUM COMPANY LP,	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB No. _____
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

TO: Don Brown
Clerk of the Board
Illinois Pollution Control Board
100 W. Randolph Street, Suite 11-500
Chicago, Illinois 60601
(VIA ELECTRONIC MAIL)

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the **APPEARANCE FOR KATHERINE D. HODGE, APPEARANCE FOR JOSHUA J. HOUSER, and PETITION TO APPROVE ALTERNATIVE THERMAL EFFLUENT LIMITATIONS,** a copy of which are herewith served upon you.

Respectfully submitted,

MARATHON PETROLEUM COMPANY LP,

Dated: December 15, 2017

By: /s/ Joshua J. Houser
One of Its Attorneys

Katherine D. Hodge
Joshua J. Houser
HEPLERBROOM, LLC
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Springfield, Illinois 62711
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CERTIFICATE OF SERVICE

I, Joshua J. Houser, the undersigned, on oath state the following:

That I have served the attached **APPEARANCE FOR KATHERINE D. HODGE, APPEARANCE FOR JOSHUA J. HOUSER, and PETITION TO APPROVE ALTERNATIVE THERMAL EFFLUENT LIMITATIONS,** via electronic mail upon:

Don Brown
Clerk of the Board
Illinois Pollution Control Board
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That my email address is Joshua.Houser@heplerbroom.com.

That the number of pages in the email transmission is 1,453.

That the email transmission took place before 5:00 p.m. on the date of December 15, 2017.

/s/ Joshua J. Houser
Joshua J. Houser

Date: December 15, 2017

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v.	)	PCB No. _____
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

APPEARANCE

I, Katherine D. Hodge, hereby file my appearance in this proceeding on behalf of the Petitioner, Marathon Petroleum Company LP.

Respectfully submitted,

Dated: December 15, 2017

By: /s/ Katherine D. Hodge
Katherine D. Hodge

Katherine D. Hodge
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Petitioner,	)	
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	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

APPEARANCE

I, Joshua J. Houser, hereby file my appearance in this proceeding on behalf of the Petitioner, Marathon Petroleum Company LP.

Respectfully submitted,

Dated: December 15, 2017

By: /s/ Joshua J. Houser
Joshua J. Houser

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	)	
Respondent.	)	

PETITION TO APPROVE
ALTERNATIVE THERMAL EFFLUENT LIMITATIONS

Pursuant to 35 Ill. Admin. Code § 304.141(c), Section 316(a) of the Clean Water Act ("Section 316(a)"), and 35 Ill. Admin. Code Part 106, Subpart K, Marathon Petroleum Company LP ("Marathon") requests that the Illinois Pollution Control Board ("Board") approve and apply the alternative thermal effluent limitations set forth in this petition to discharges from Marathon's refinery in Robinson, Illinois, instead of effluent limits derived from 35 Ill. Admin. Code § 302.211(d) and (e).

I. INTRODUCTION

Marathon owns and operates an integrated petroleum refinery located at 100 Marathon Avenue, Robinson, Crawford County, Illinois ("Refinery"). The Refinery generates wastewater from its petroleum refining processes, cooling tower and boiler blowdown, hydrostatic testing, stormwater runoff, off-facility wastewater and hydrostatic test water from terminals and pipelines, fire and utility water usage, and sanitary wastewater. The Refinery discharges wastewater and stormwater via nine outfalls to Robinson Creek, Marathon Creek, and an unnamed creek, drainage tile, and ditches pursuant to its National Pollutant Discharge

Elimination System ("NPDES") Permit. *See* NPDES Permit No. IL0004073 (modified Sept. 19, 2013) ("NPDES Permit"), at Exhibit 1.

Specifically, the Refinery treats wastewater in its wastewater treatment plant ("WWTP") and discharges the treated wastewater to Robinson Creek from Outfall 001. The Refinery discharges treatment plant bypass wastewater and east impoundment basin wastewater to Marathon Creek via Outfalls 002 and 003, respectively. The Refinery also discharges stormwater to Robinson Creek, Marathon Creek, an unnamed creek, an unnamed creek drainage tile, and unnamed ditches via Outfalls 005, 006, 007, 008, 009, and 010.

The Refinery discharges treated industrial process wastewater from Outfall 001 with an average proposed discharge of 2.666 MGD and peak average flow of 3.434 MGD, and intermittent discharges from the other outfalls. The City of Robinson operates a publicly owned treatment works that discharges to Robinson Creek upstream of the Refinery's Outfall 001. Variability of ambient temperatures and upstream flows, including the City of Robinson's discharges, make Robinson Creek susceptible to temperature changes.

The Refinery's discharges from Outfall 001 to Robinson Creek are subject to thermal effluent limitations in the Refinery's NPDES Permit that are based on the temperature standards in 35 Ill. Admin. Code § 302.211(d) and (e) and allowed mixing requirements in 35 Ill. Admin. Code 302.102. Specifically, the existing limitations for Outfall 001 are described in Special Condition 8 of the NPDES Permit, as follows:

> Special Condition 8. 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 Administrative 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 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 regime as the temperatures of the main flow of the river.)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
°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

However, as demonstrated in this petition, the above thermal effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in Robinson Creek (the receiving waters of the Refinery's discharge from Outfall 001). Thus, pursuant to 35 Ill. Admin. Code § 304.141(c), Section 316(a) of the Clean Water Act ("CWA"), and 35 Ill. Admin. Code Part 106, Subpart K, Marathon's alternative thermal effluent limitations requested in this petition are reasonable and appropriate.

II. LEGAL STANDARDS APPLICABLE TO SECTION 316(a) RELIEF

Section 316(a) of the CWA grants a discharger of heated effluent the right to obtain specific effluent limits for its discharge that differ from generally applicable limits that would otherwise govern. Specifically, Section 316(a) provides:

> With respect to any point source otherwise subject to the provisions of Section 301 or Section 306 of the [Clean Water] Act, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from any such source will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such section on such plant, with respect to the

> thermal component of such discharge (taking into account the interaction with other pollutants), that will assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on that body of water.

33 U.S.C. § 1326(a).

In Illinois, Section 316(a) is implemented through 35 Ill. Admin. Code § 304.141(c) and 35 Ill. Admin. Code Part 106, Subpart K. Section 304.141(c) authorizes the Board to determine that specific thermal standards should apply to a particular discharger instead of those imposed by the Board's generally applicable rules. Specifically, Section 304.141(c) provides:

> The standards of this Chapter shall apply to thermal discharges unless, after public notice and opportunity for public hearing, in accordance with section 316 of the CWA, applicable federal regulations, and procedures in 35 Ill. Adm. Code 106, Subpart K, the Board has determined that different standards shall apply to a particular thermal discharge.

35 Ill. Admin. Code § 304.141(c).

Part 106, Subpart K sets forth the procedural rules for the Board's review and issuance of alternative thermal effluent limitations under Section 316(a). Prior to filing a petition seeking alternative limitations, the petitioner must submit early screening information and a detailed plan of study to the Illinois Environmental Protection Agency ("Illinois EPA"), describing the proposed alternative limits, how the petitioner will make the required demonstration, and types of data the petitioner intends to submit. *See* 35 Ill. Admin. Code §§ 106.1115, 106.1120. The petitioner must then consult with Illinois EPA to discuss the early screening information and seek Illinois EPA's recommendations regarding the detailed plan of study. *See id.* The petitioners must then complete the plan of study prior to filing a petition with the Board. *See* 35 Ill. Admin. Code § 106.1120(g).

The burden of proof is on the petitioner to demonstrate "that the otherwise applicable effluent limitations . . . are more stringent than necessary to assure the protection and

propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge is made." 35 Ill. Admin. Code § 106.1160(a), (b). The petitioner must also "show that the alternative thermal effluent limitation desired by the petitioner, considering the cumulative impact of its thermal discharge, together with all other significant impacts on the species affected, will assure the protection and propagation of a balanced indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made." 35 Ill. Admin. Code § 106.1160(c).[1]

In addition to showing that proposed alternative limits are protective of the balanced indigenous community, the regulations implementing Section 316(a) recognize that an existing discharger may support alternative thermal effluent limitations based on predictive studies. 35 Ill. Admin. Code § 106.1160(d); 40 C.F.R. § 125.73(c)(1).

In 1977, the United States Environmental Protection Agency ("USEPA") issued draft guidance on Section 316(a) demonstrations in "Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT)" dated May 1, 1977 ("316(a) Manual"). The 316(a) Manual provides that it "is intended to be used as a general guidance and as a starting point for discussions," and that delegated state agencies "are not rigidly bound by the contents of this document." 316(a) Manual, at 8-9. In recent decisions by the Board on petitions for alternative thermal effluent limitations under Section 316(a), the Board has used the 316(a) Manual decision criteria in its analysis of whether the petitioner has met the requirements for obtaining relief under Section 316(a). *See* Board Opinion and Order, *Exelon Generation LLC v. Illinois Environmental Protection Agency*, PCB No. 14-123 (Ill.Pol.Control.Bd. Sept. 18, 2014); Board Opinion and

[1] The term "balanced, indigenous community" in 35 Ill. Admin. Code Part 106 Subpart K is defined to be synonymous with the term "balanced, indigenous population" in the CWA. *See* 35 Ill. Admin. Code § 106.1110.

Order, *Exelon Generation LLC (Dresden Nuclear Generating Station) v. Illinois Environmental Protection Agency*, PCB No. 15-204 (Ill.Pol.Control.Bd. Mar. 3, 2016).

As discussed below, Marathon's Section 316(a) demonstration ("Section 316(a) Demonstration") provides sufficient evidence that the thermal effluent limitations for Marathon's Refinery Outfall 001 are more stringent than necessary to protect the balanced indigenous community and should be superseded and replaced by the alternative thermal effluent limitations requested in this petition.

III. PETITION

35 Ill. Admin. Code § 106.1130(a) requires a petition contain a general plant description, including certain specific information as applicable. Marathon submits the following general plant description for the Refinery and the Section 316(a) Demonstration, including information listed in Section 106.1130(a), where applicable.

A. General Plant Description

The Refinery is a complex, integrated petroleum refinery that produces petroleum-based fuel products to meet consumer demands in this region. The Refinery produces numerous products including gasoline, distillates, propane, anode-grade coke, aromatics, fuel-grade coke, and slurry. The Refinery is in continuous operation, operating 24 hours per day, 7 days per week, 365 days per year. Periodically, various process units will be shut down for both planned and emergency maintenance activities. The Refinery has the capacity to process 245,000 barrels of crude oil per day. Additional information is provided in Exhibit 2, Marathon Robinson Refinery Fact Sheet.

1. Generating Capacity

Section 106.1130(a)(1) requests information regarding a power plant's capacity to generate electricity. This information is not applicable to the Refinery.

2. Type of Fuel Used

Section 106.1130(a)(2) requests information regarding the type of fuel used by a power generating facility. The following information describes how the refining process works and the fuels used to power the refinery processes. The Refinery uses crude oil as its major raw material. The crude is delivered by pipeline and by tanker trucks to the Refinery. The crude oil is first heated and fractionated in distillation columns to separate it into its various natural petroleum fraction or products. Some of these fractionation products can be marketed after this first step; however, more useful products can be manufactured by further processing in other Refinery process units. Hydrocarbon molecules that are too large (i.e., long-chain hydrocarbons) to be used as high-value fuels are further processed in cracking or conversion units such as the Cokers, Fluid Catalytic Cracking Unit, or Unicracker. Molecules that are too small can be used in the Refinery's heaters as a fuel gas or can be recombined with other molecules to make liquid fuels in units such as the HF Alkylation Unit. Other process units at the Refinery perform functions such as removing contaminants from intermediate or product streams, increasing fuel octane value, or blending products to customer specification. The various process units at the Refinery are "fueled" by either natural gas or refinery fuel gas. Additional energy is provided from steam produced by the Refinery and electricity purchased off the grid.

3. Operating Characteristics of the Condenser Cooling System

The information requested in Section 106.1130(a)(3) is not applicable to the Refinery; however, see the discussion in Section III.B.1 below regarding the types of cooling systems used at the Refinery.

4. History of the Load Factor for the Past Five Years

The information requested in Section 106.1130(a)(4) is not applicable to the Refinery because the "load factor" applies to power plants.

5. Projected Load Factors for the Next Five Years

The information requested in Section 106.1130(a)(5) is not applicable to the Refinery because the "load factor" applies to power plants.

6. Estimated Dates of Unit Retirement and Plans for Additional Units

Marathon currently does not have any plans to permanently shut down any process units at the Refinery, nor does Marathon have any plans for additional units.

7. History of Plant Shutdowns for the Last Five Years

The Refinery is never entirely shut down.

8. Planned and Emergency Shutdowns with Frequency and Duration for the Last Five Years

The Refinery is never entirely shut down.

9. Planned and Projected Shutdowns with Frequency and Duration for the Next Five Years

The Refinery is never entirely shut down.

B. Description of Method for Heat Dissipation

1. Type of System Used

The Refinery operates a wet surface air cooler ("WSAC") to cool the crude desalter effluent stream, which is the warmest wastewater stream, before it feeds into the Refinery's WWTP. The desalter effluent leaves the 2nd stage desalter through the 2nd stage desalter level control valve and then to a series of cooling water rundown coolers. It is then sent to two air coolers in series and thereafter leaves the Crude Unit boundary limits and sent to the WWTP. The WSAC is operated year round except during maintenance. The flow is either routed directly to the Main Lift Station or diverted to WWTP front end tanks. Marathon installed and began operating the WSAC in April 2016 as part of the Crude Unit Light Crude Upgrade Project. The WSAC is designed to remove approximately 5.6 mmBtu/hr. The crude desalter effluent stream constitutes approximately seventeen percent of the wastewater treated by the WWTP.

The Refinery also operates three cooling towers to cool various process streams via closed loops. The three cooling towers have average duties of 246 mmBtu/hr, 465 mmBtu/hr, and 128 mmBtu/hr, respectively, for a total of 839 mmBtu/hr. These cooling towers have a combined blow down of approximately 300 gallons per minute to the WWTP, which constitutes approximately fourteen percent of the flow to the WWTP.

2. Summary Information on Temperature of Discharge to Receiving Waters

Discharge temperature data from 2002 – 2016 are provided in Exhibit 3. Discharge temperatures are also discussed in the accompanying Technical Support Documentation for Alternative Thermal Effluent Limitations under Section 316(a) of the Clean Water Act and 35 Ill. Adm. Code 304.141(c) for the Marathon Petroleum Company LP Refinery located in Robinson, Illinois, prepared by Midwest Biodiversity Institute (Dec. 15, 2017) (hereafter

"Section 316(a) TSD"). *See* Exhibit 4, at 8-10. Under Special Condition 8 of Marathon's NPDES Permit, the "winter" months are December – March and the "summer" months are April – November.

C. Summary of Compliance or Non-Compliance with Thermal Requirements at the Facility in the Past Five Years

During the past five years, Marathon has exceeded a temperature effluent limitation on only a handful of occasions. In particular, downstream temperature readings exceeded the applicable temperature limitation seven times. The limitation restricting temperature increase in the receiving stream by no more than 5°F above natural temperatures was exceeded four times. However, as discussed in more detail in Section III.E.1., below, Illinois EPA has proposed to significantly change the monitoring frequency to demonstrate compliance with the temperature effluent limitations, and modeling indicates it will result in an increase in non-compliance with the existing temperature effluent limitations.

D. The Detailed Plan of Study Submitted to the Agency Pursuant to Section 106.1120(a) and the Agency's Written Response Pursuant to Section 106.1120(f)

Marathon submitted the required Early Screening Information, as described in 35 Ill. Admin. Code § 106.1115, to Illinois EPA on March 11, 2016. Marathon received approval from Illinois EPA of the Early Screening Information on March 24, 2016. Pursuant to 35 Ill. Admin. Code § 106.1120, the next step in petitioning for an alternative thermal effluent limitation, Marathon submitted its Detailed Plan of Study to Illinois EPA on April 18, 2016. Illinois EPA approved Marathon's Detailed Plan of Study on May 17, 2016, and the Illinois Department of Natural Resources ("IDNR") issued a letter of no objection to Marathon's Detailed Plan of Study on June 2, 2016. Copies of the Early Screening Information, Detailed Plan of Study, and Illinois EPA and IDNR letters are provided in Exhibit 5.

E. The Results of the Studies Conducted Pursuant to the Detailed Plan of Study Submitted Under Section 106.1120, Including, but not Limited to:

1. Background on the Proposed Alternative Thermal Effluent Limitations

Marathon is authorized to discharge treated effluent from its Refinery to Robinson Creek via Outfall 001 pursuant to its NPDES Permit. Special Condition 8 of the NPDES Permit provides that Marathon must comply with certain effluent limitations, which are based upon water quality standards at 35 Ill. Admin. Code §§ 302.211(d) and (e), as measured at the edge of a mixing zone that is defined by 35 Ill. Admin. Code § 302.211. *See* Exhibit 1, NPDES Permit, at 6-7.

The City of Robinson operates a publicly owned treatment works that discharges to Robinson Creek upstream of the Refinery's Outfall 001. Variability of ambient temperatures and upstream flows, including the volume of City of Robinson's continuous discharge, make Robinson Creek susceptible to temperature changes. Under certain ambient temperature and river flow conditions, Marathon is unable to comply with some of the above-referenced permit limitations. For example, there are periods of time where the ambient (i.e., upstream) temperature of Robinson Creek exceeds the monthly maximum limit, effectively preventing Marathon from complying with the limit. Additionally, Illinois EPA has proposed a new temperature monitoring protocol in Marathon's draft renewal NPDES permit. In order to determine if Marathon could comply with the existing temperature limitations, which are based on the current Illinois temperature water quality standards, under the Illinois EPA's proposed new temperature monitoring protocol, Marathon retained Tetra Tech, Inc. ("TTI") to develop thermal modeling to assess temperature in Robinson Creek upstream and downstream of the Refinery during the past 6 years. *See* Exhibit 6, Tetra Tech, Inc., Final Hydrodynamic and

Temperature Modeling Report for Robinson Creek, Illinois, at 1 (May 9, 2017) (hereafter "TTI Report"). Marathon is hereby seeking alternative thermal effluent limitations under Section 316(a) due to both measured and modeled excursions of certain of the water quality based effluent temperature limitations in Marathon's current and proposed draft renewal permit applicable to the discharge of heat via the Refinery's Outfall 001.

As further discussed below, the studies conducted in connection with Marathon's Section 316(a) Demonstration establish that the existing effluent temperature limitations for the Refinery, which are based on 35 Ill. Admin. Code § 302.211(d) and (e), are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in the receiving waters of the Refinery's discharge from Outfall 001, Robinson Creek. In addition to demonstrating that the 5°F Δ limit based upon 35 Ill. Admin. Code § 302.211(d) is unnecessary to protect the balanced indigenous population, Marathon's Section 316(a) Demonstration supports the following alternative thermal effluent limitations for the Refinery, instead of the limitations based upon 35 Ill. Admin. Code § 302.211(e):

> Water temperature in Robinson Creek downstream from the MPC 001 outfall at a point instream in the vicinity of the IL Route 1 bridge shall not exceed the maximum limits in the following table during more than one (1) percent of the hours in the 12-month period ending with any month. Moreover, at no time shall the water temperature at such location exceed the maximum limits in the following table by more than 3°F (1.7°C). (Robinson Creek temperatures are temperatures of those portions of the creek essentially similar to and following the same thermal regimes as the temperature of the main flow of the creek.) The average water temperature in Robinson Creek downstream from the MPC 001 outfall at a point instream in the vicinity of the IL Route 1 bridge for the period June 16 – September 15 shall not exceed 87°F.

	Jan.	**Feb.**	**Mar.**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
°F	65	65	74	82	88	90	90	90	90	87	85	74
°C	18.3	18.3	23.3	27.8	31.1	32.2	32.2	32.2	32.2	30.6	29.4	23.3

Finally, Marathon's Section 316(a) Demonstration addresses allowed mixing. *See* Exhibit 6, TTI Report, at 16, 23-25.

2. Information on Data Collection Program and Methodologies

Marathon retained Midwest Biodiversity Institute ("MBI") and TTI to assist with conducting biological and water quality assessments, performing thermal modeling, evaluating whether the Refinery's thermal discharges under the alternative thermal effluent limitations proposed herein will be protective of the balanced indigenous community, and preparing the Section 316(a) TSD and supporting information. *See generally* Exhibit 4, Section 316(a) TSD; Exhibit 6, TTI Report. Consistent with the USEPA 316(a) Manual, MBI performed a predictive demonstration because the biota in Robinson Creek are currently impaired by multiple non-thermal stressors both upstream and downstream of Marathon's Outfall 001. *See* Exhibit 4, Section 316(a) TSD, at 2. MBI's predictive demonstration used the Fish Temperature Modeling System ("FTMS") (Yoder 2008) to determine protective "true summer" (June 16 – September 15) maximum and average temperatures for a list of Representative Important Species ("RIS"), and compared the results to the measured and modeled summer temperature regime. *Id*.

The Section 316(a) Demonstration includes a description of the need for alternative thermal effluent limitations, characterization of the measured and modeled temperature regime in Robinson Creek, quantification of measured and modeled exceedances of the current Illinois temperature standard, the rationale for the development of a list of RIS, a description of outputs from the FTMS, and an analysis of the frequency of thermal stress and recovery periods with an evaluation of the significance of intermittent high temperatures as these are offset by stress recovery periods. *Id*. The latter concept is a contemporary concept that challenges a sole reliance on maximum only standards. *Id*. Marathon's current 5°F Δ effluent limitation was

evaluated and it was concluded that the limitation is more stringent than necessary to protect the balanced indigenous community of Robinson Creek. *Id*. This finding is supported by recent scientific literature and consistent with State examples of WQS modernization that emphasize averages and exceedance of maximum thresholds and frequencies in lieu of maximum only standards and °F Δ provisions. *Id*. Lastly, the FTMS results for the summer (June 16 – September 15) and analysis of the ambient and modeled temperature regime were used to develop the alternative thermal effluent limitations for the non-summer months. *Id*.

3. Summaries of Physical, Chemical, Biological and Technical Data Supporting the Demonstration, Along With a Discussion of the Data

a. Biological and Water Quality Assessment

In accordance with the USEPA 316(a) Manual, Marathon's Early Screening assured that only the most relevant aquatic assemblages would be assessed and without collecting data that is either redundant or of little value to Marathon or Illinois EPA. *Id*. at 5. MBI evaluated each biotic category listed in the USEPA 316(a) Manual for applicability in Robinson Creek and determined whether it merited inclusion in the Section 316(a) Demonstration based on the following:

- A search of readily available biological databases and reports for Robinson Creek and nearby Wabash Faunal Region streams;
- Recent knowledge about which biotic categories (i.e., biological assemblages) are routinely used to assess streams and rivers in the Midwestern U.S;
- The likelihood of a biotic category showing adverse impacts due the discharge of heat by the Refinery; and
- The general utility of a biotic category for exhibiting non-thermal responses, which is an important need for separating thermal and non-thermal stressors.

Id. Based on the above, MBI selected macroinvertebrates, shellfish, and fish as the biological assemblages for the 2016 bioassessment. *Id*. at 5-6.

Macroinvertebrates are a mainstay of stream and river biological assessments and include all invertebrate taxa that can be seen by the "unaided" eye, i.e., without magnification aids. *Id*. at 6. While macroinvertebrates are generally regarded as being more thermally tolerant than fish, their inclusion was deemed necessary since they are used by Illinois EPA to determine the status of the General Use for aquatic life for Section 303(d) impaired waters listings. *Id*. Macroinvertebrates are also useful to assess non-thermal causes of impairment. *Id*.

For shellfish in freshwater rivers and streams, this biotic category primarily includes freshwater mussels of the family Unionidae and freshwater snails. *Id*. While some snails and small freshwater clams are collected in the macroinvertebrate assemblage sampling, the larger Unionidae are not included and require a separate sampling effort and assessment method. *Id*. Recent information suggests that certain species of mussels are as thermally sensitive as fish and they are the principal driver of the recently proposed USEPA ammonia criterion. *Id*. Based on this recent information, mussels were included as a biological assemblage due to the potential for adverse effects from thermal enrichment and non-thermal impacts. *Id*.

Fish are widely recognized as having the highest sensitivity to thermal enrichment and are frequently the singular focus of predictive demonstrations and RIS lists. *Id*. Prior assessments of Robinson Creek conducted by Illinois EPA provide the most complete species occurrence database, which is essential to a predictive demonstration. *Id*.

MBI conducted a biological and water quality assessment from June to October 2016 that included field studies of the high potential impact biological assemblages (fish, macroinvertebrates, mussels), habitat, and the chemical water quality of the Sugar Creek watershed, which includes Robinson and Sugar Creeks and their major tributaries

("Bioassessment"). *Id*. at 7. The Bioassessment was designed to produce the quantity and quality of data needed to meet the following objectives:

- Document the current General Use aquatic life status in Robinson, Marathon, and Sugar Creeks and their tributaries;
- Assess the chemical/physical quality of each stream with chemical water column, chemical sediment, physical habitat, and temperature monitoring techniques;
- Determine the major causes and sources of any observed impairments; and
- Document the trajectory of any changes in biological and chemical/physical conditions as compared to available historical data from the Illinois EPA's Facility Related Stream Surveys ("FRSS") and Illinois EPA's/Illinois Department of Natural Resources' Basin Surveys.

Id. The Bioassessment accomplished this by building on prior FRSS conducted by Illinois EPA in Robinson Creek dating to 1992 (1992, 2008, and 2013). *Id*. Given the need to account for a complex array of overlapping impacts from upstream sources, non-thermal chemical stressors, and physical alterations to flow and habitat, MBI used an intensive pollution survey design that included more sites than the prior FRSS efforts. *Id*.

The Bioassessment revealed that biological impairments persisted for the entire length of Robinson Creek both upstream and downstream from the Refinery's Outfall 001 in 2016. *Id*. The data collected were signatures of a response to non-thermal toxicity, which accounts for the majority of the biological impairment observed downstream from Outfall 001 in Robinson Creek. *Id*. These results supported MBI's use of a predictive demonstration to address thermal issues in Robinson Creek under Section 316(a). *Id*. MBI's Bioassessment report describes these findings in more detail. *See* Exhibit 7, Midwest Biodiversity Institute, Biological and Water Quality Assessment of Robinson and Sugar Creeks and Tributaries 2016 (Dec. 15, 2017), at 60-66.

b. Temperature Regimes

In 2016, MBI characterized the ambient temperature regime by deploying Datasonde and HOBO continuous monitors at selected locations upstream and downstream from the Refinery's Outfall 001. *See* Exhibit 4, Section 316(a) TSD, at 8. Datasondes were deployed at five locations for consecutive 3-4 day periods once each month during 2016. *Id*. HOBO recorders were deployed continuously during June 2016 – February 2017 at three locations. *Id*. HOBO data also exists for November 2015 – January 2016 at two locations. *Id*. Together, the Datasonde and HOBO results were used to characterize the ambient temperature regime in Robinson Creek both outside and within the influence of the Refinery's Outfall 001 discharge. *Id*.

The Datasonde and HOBO results are summarized in the Section 316(a) TSD with respect to the existing effluent temperature limitations for the Refinery, which are based on 35 Ill. Admin. Code § 302.211(d) and (e), including the monthly maximum, frequency not to exceed, and the 5°F Δ provisions. *Id*. The frequency of exceedance of the existing effluent temperature limitations and frequency of exceedance allowances were determined for the "summer" (April-November) and "winter" (December-March) periods specified by the Marathon permit. *Id*. Although not part of the permit limitations or underlying Illinois standards, exceedance of an average temperature of 86°F during the true summer period of June 16 – September 15 was used as an initial screen for potential adverse effects on the aquatic biota. *Id*. As further discussed in the Section 316(a) TSD, scientific studies support 86°F serving as a general screening value for potential adverse effects due to heat, with 86°F being used as a summer average to complement the effluent limitation setting a maximum of 90°F. *See id*.

The Datasonde and HOBO results show frequent exceedances of the 5°F Δ effluent limitation using the selected control site as the benchmark of comparison. *See id*. at 9, Tables 2 and 3. Statistics on the frequency of exceedance of the permit maximum limitations and the frequency of exceedance of the maximums by >3°F are also provided. *See id*. Exceedances of the 60°F maximum during the "winter" months of December-March (%max Wi) were the most frequent in December, February, and early March and during the transition from winter to spring and fall to winter. *See id*.

Graphed results of selected Datasonde and field grab sampling results show that the extent of thermal alteration resulting from the Refinery's Outfall 001 effluent in terms of exceedances of the existing effluent temperature limitations were the greatest and most frequent immediately downstream from Outfall 001 and generally dissipate with distance downstream. *Id*. at 9, Figure 4. These results also show that thermal alterations do not extend beyond the mouth of Robinson Creek, which has an approximate 15 square mile catchment. *Id*.

Modeling was also used to characterize the ambient temperature regime for the period 2011 – 2016 using HOBO data collected in 2015 and 2016 by Marathon and Datasonde data collected by MBI in 2016 as the calibration dataset and the Refinery Outfall 001 effluent as the verification dataset. *Id*. at 9. The Environmental Fluid Dynamics Code ("EFDC") hydrodynamic and temperature model was used to quantify the sources (Robinson WWTP, Refinery Outfall 001, tributary inputs, and meteorological inputs) of potential variations on ambient temperatures in Robinson Creek. *See id.*; *see also* Exhibit 6, TTI Report, at 1. It was also used to predict instream temperatures over a broad range of ambient conditions deriving the same monthly and summer period exceedances and durations, as was done with the 2016 ambient temperature data, and for three time periods, 2011 – 2016, 2012 only, and 2016 only.

See Exhibit 4, Section 316(a) TSD, at 9-10, Tables 4, 5, and 6. The 2011 – 2016 period represents a reasonably extended period of time, 2012 represents a critical year with high ambient air temperatures and critically low stream flows, and 2016 represents the time period of the comprehensive water quality and biological assessment. *Id*. at 10.

Modeled temperature exceedances were less frequent than the Datasonde results and more in line with the 2016 HOBO results. *Id*. As with the measured data, exceedances of the 5°F Δ limitations and the winter maximum temperature limitation of 60°F were frequent. *Id*. Exceedances of the true summer (June 16 – September 15) 86°F average screening value and the frequency of exceedances of the maximum summer limitation of 90°F were less frequent. *Id*. The modeled results for 2012 and 2016 at four Robinson Creek locations illustrate the annual seasonal cycles of temperature and when the periods of exceedance of the "winter" limitation of 60°F and the "summer" limitation of 90°F are simulated to occur. *Id*. at 10, Figures 6-7. In 2012, there were a few instances of predicted exceedances of the 3°F allowance above the summer maximum, but none were predicted for 2016. *Id*.

4. Criteria or Methodology Used to Assess Whether a Balanced Indigenous Community of Shellfish, Fish and Wildlife Will Be Maintained in the Receiving Waters and the Protection of Threatened and Endangered Species

As previously discussed, consistent with USEPA's 316(a) Manual, MBI determined that a predictive demonstration was appropriate for this Section 316(a) Demonstration because the biota in Robinson Creek are currently impaired by multiple non-thermal stressors both upstream and downstream of the Refinery's Outfall 001. *Id*. at 2. The primary focus of the Section 316(a) Demonstration's predictive analysis is to determine whether there are any potential adverse effects of the temperature regime downstream from the Refinery's Outfall 001 in Robinson Creek and determine if alternative thermal effluent limitations pursuant to a Section 316(a)

demonstration are warranted. *Id*. at 11. Marathon seeks alternative thermal effluent limitations under Section 316(a) due to both measured and modeled excursions of certain provisions of Marathon's current effluent temperature limitations by the current discharge of heat via the Refinery's Outfall 001. *Id.* MBI's predictive demonstration used the FTMS to determine protective "true summer" (June 16 – September 15) maximum and average temperatures for a list of RIS, and compared the results to the measured and modeled summer temperature regime. *Id*. at 2.

As demonstrated in the Section 316(a) TSD, the FTMS derived summer period maximum of 90.7°F and average of 87.1°F are sufficiently protective to serve as alternatives to the current 90°F maximum and the 5°F Δ limitations. *Id.* Marathon's proposal, however, takes a conservative approach by using the maximum of 90°F, instead of 90.7°F, and the average of 87°F, instead of 87.1°F. *Id*. at 2-3. The 3°F allowance above the maximum and 1% exceedance provisions of the current effluent limitations are sufficient to preclude excessive exceedances of the maximum FTMS threshold. *Id*. at 3. For the non-summer periods, maximum temperature limitations consistent with the thermal regime downstream from the Refinery's Outfall 001 discharge should apply given the absence of any evidence or expectation of adverse effects during these periods. *Id*. Monthly maximums that account for seasonal increases and decreases in temperature during the Spring and Fall periods are also included as an alternative to the abrupt change from 60°F to 90°F in April and 90°F to 60°F in December. *Id.* These alternative thermal effluent limitations are based upon Datasonde data, HOBO data, and modeling projections, and are consistent with the seasonal acclimation requirements of warmwater fish assemblages in Robinson Creek. *Id.*

Based on the determination of true summer season short- and long-term protective thresholds and the analysis of the dynamics of the temperature regime downstream from the Refinery's Outfall 001 in Robinson Creek, the current Outfall 001 thermal discharge should not preclude recovery of the resident biota to meet the Illinois General Use for aquatic life. *Id.* This meets the goal of Section 316(a) in that the current temperature regime "will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water," i.e., Robinson Creek. *Id.* Exceedances of the FTMS short-term threshold of 90.7°F are brief and sufficiently offset by lower temperatures that provide for adequate recovery periods. *Id.* Summer period averages were well below the FTMS long-term survival threshold and virtually 100% of the upper avoidance temperatures of the RIS. *Id.* The Mean Weekly Average Temperature for growth is exceeded for only two recreational species, which is using a liberal interpretation of "recreational" (e.g., including white sucker). *Id.* The analyses and observations in the Section 316(a) Demonstration support the conclusion that the current thermal regime is sufficiently protective of the RIS and the full assemblages by extension. *Id.* As such, this satisfies the demonstration that the requested alternative thermal effluent limitations under Section 316(a) are justified.

F. Any Additional Information or Studies, Including Information or Guidance Published by USEPA, That the Petitioner Judges to Be Appropriate to Support the Alternative Thermal Effluent Limitation Demonstration

There is no additional information or studies beyond what has been discussed above.

G. Requested Relief

Marathon requests that the Board enter an order finding that the existing temperature limitations for discharges from the Refinery's Outfall 001 are more stringent than necessary to

assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in the receiving waters of the Refinery's discharge from Outfall 001.

Marathon requests that, in lieu of the existing temperature limitations in Marathon's NPDES Permit based on 35 Ill. Admin. Code §§ 302.211(d) and (e), the Board approve the following alternative thermal effluent limitations for discharges from the Refinery's Outfall 001:

- Water temperature in Robinson Creek downstream from the MPC 001 outfall at a point instream in the vicinity of the IL Route 1 bridge shall not exceed the maximum limits in the following table during more than one (1) percent of the hours in the 12-month period ending with any month. Moreover, at no time shall the water temperature at such location exceed the maximum limits in the following table by more than 3°F (1.7°C). (Robinson Creek temperatures are temperatures of those portions of the creek essentially similar to and following the same thermal regimes as the temperature of the main flow of the creek.) The average water temperature in Robinson Creek downstream from the MPC 001 outfall at a point instream in the vicinity of the IL Route 1 bridge for the period June 16 – September 15 shall not exceed 87°F.

	Jan.	**Feb.**	**Mar.**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
°F	65	65	74	82	88	90	90	90	90	87	85	74
°C	18.3	18.3	23.3	27.8	31.1	32.2	32.2	32.2	32.2	30.6	29.4	23.3

- In lieu of 35 Ill. Admin. Code § 302.102(b)(8), the following shall apply: the area and volume of mixing shall extend from the MPC 001 Outfall to a point instream in the vicinity of the IL Route 1 bridge.

Also, Marathon proposes that the instream sampling location for monitoring the alternative thermal effluent limitations, i.e. the point of compliance, be located at a point instream in the vicinity of the IL Route 1 bridge.

WHEREFORE, for the foregoing reasons, Marathon respectfully requests that its Petition to Approve Alternative Thermal Effluent Limitations be granted and that the Board provide Marathon the relief requested herein.

<*signature on following page*>

Respectfully submitted,

MARATHON PETROLEUM COMPANY LP

By: /s/ Katherine D. Hodge
One of Its Attorneys

Dated: December 15, 2017

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EXHIBITS

Exhibit 1	NPDES Permit No. IL0004073 (modified Sept. 19, 2013) ("NPDES Permit")
Exhibit 2	Marathon Robinson Refinery Fact Sheet
Exhibit 3	Discharge Temperature Data from 2002 – 2016
Exhibit 4	Midwest Biodiversity Institute, Technical Support Documentation for Alternative Thermal Effluent Limitations under Section 316(a) of the Clean Water Act and 35 Ill. Adm. Code 304.141(c) for the Marathon Petroleum Company LP Refinery located in Robinson, Illinois (Dec. 15, 2017) ("Section 316(a) TSD")
Exhibit 5(a)	Early Screening Information submitted to Illinois EPA on 3/11/2016
Exhibit 5(b)	Illinois EPA Approval Letter for Early Screening Information dated 3/24/2016
Exhibit 5(c)	Detailed Plan of Study submitted to Illinois EPA on 4/18/2016
Exhibit 5(d)	Illinois EPA Approval Letter for Detailed Plan of Study dated 5/17/2016
Exhibit 5(e)	IDNR "No Objection" Letter for Detailed Plan of Study dated 6/2/2016
Exhibit 6	Tetra Tech, Inc., Final Hydrodynamic and Temperature Modeling Report for Robinson Creek, Illinois (May 9, 2017) ("TTI Report")
Exhibit 7	Midwest Biodiversity Institute, Biological and Water Quality Assessment of Robinson and Sugar Creeks and Tributaries 2016 (Dec. 15, 2017)