THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF LOUISIANA
LAFAYETTE DIVISION

UNITED STATES OF AMERICA,	)	
	)	
And,	)	
	)	
THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY,	)	
	)	
Plaintiffs,	)	
v.	)	**Civil Action No: 17-CV-1660**
	)	
ORION ENGINEERED CARBONS, LLC,	)	
	)	
Defendant.	)	
	)	

CONSENT DECREE

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WHEREAS, Plaintiffs, the United States of America ("the United States"), on behalf of the United States Environmental Protection Agency ("EPA"), and the State of Louisiana, through the Louisiana Department of Environmental Quality ("LDEQ"), are concurrently with this Consent Decree filing a complaint ("Complaint") against Orion Engineered Carbons, LLC ("Defendant" or "Orion") pursuant to Sections 113(b) and 167 of the Clean Air Act ("Clean Air Act" or "the Act"), 42 U.S.C. §§ 7413(b) and 7477. The Complaint seeks injunctive relief and the assessment of civil penalties for violations of one or more of the following statutory and regulatory requirements of the Act at Defendant's Belpre, Ivanhoe, Borger, and Orange carbon black facilities: the Prevention of Significant Deterioration ("PSD") provisions of the Act, 42 U.S.C. §§ 7470-7492; the Nonattainment New Source Review ("Nonattainment NSR") provisions of the Act, 42 U.S.C. §§ 7501-7515 (including failure to operate the facilities without installing best available control technology ("BACT")); the federally-approved and enforceable Louisiana, Ohio, and Texas State Implementation Plans ("SIPs"), which incorporate and/or implement the above-listed federal PSD and/or Nonattainment NSR requirements; and Title V of the Act, 42 U.S.C. §§ 7661-7661f and/or Title V's implementing federal and state regulations; and the Texas SIP and federal provisions referenced in the March 22, 2016 Notice of Violation issued to Orion.

WHEREAS, this settlement is part of EPA's national enforcement initiative to control harmful air pollution from the largest sources of emissions, including carbon black manufacturing facilities;

WHEREAS, according to the Complaint, *inter alia*, Defendant failed to obtain the necessary permits and install and Continuously Operate the BACT necessary to reduce sulfur

dioxide ("SO_2"), nitrogen oxides ("NO_x"), carbon monoxide ("CO"), volatile organic compounds ("VOCs"), and particulate matter ("PM"), including without limitation particulate matter with a diameter of ten microns or less ("PM10"), and comply with requirements for monitoring, record-keeping, and reporting, as specified in the Act;

WHEREAS, EPA provided Defendant and the States of Louisiana, Ohio, and Texas with actual notice of the alleged violations, in accordance with Sections 113(a)(1) and (b) of the Clean Air Act, 42 U.S.C. §§ 7413(a)(1);

WHEREAS, Defendant stipulates that it does not contest the adequacy of the notice provided;

WHEREAS, EPA issued Notices of Violations ("NOVs") for the violations alleged herein on June 30, 2010 (to Degussa Engineered Carbons, LP), October 10, 2012 (to Orion Engineered Carbons, LLC), January 11, 2013 (to Orion Engineered Carbons, LLC), February 28, 2013 (to Orion Engineered Carbons, LLC), for alleged violations of PSD requirements concerning in particular the failure to obtain the necessary permits and install and Continuously Operate BACT between approximately 1986 and 2010;

WHEREAS, EPA issued a Notice of Violation to Orion Engineered Carbons, LLC on March 22, 2016, for alleged Clean Air Act violations at the Orange Facility occurring between approximately 1993 and 2016;

WHEREAS, Orion Engineered Carbons, LLC is an indirect subsidiary of Orion Engineered Carbons GmbH (a company incorporated under the laws of the Federal Republic of Germany);

WHEREAS, Orion Engineered Carbons GmbH and Evonik Degussa GmbH (a company

incorporated under the laws of the Federal Republic of Germany and an indirect subsidiary of Evonik Industries AG; altogether including its direct and indirect past and present subsidiaries referred to as "Evonik") have entered into a Share Purchase Agreement regarding the sale of shares in Evonik's worldwide carbon black companies, *inter alia* concerning the sale of the sole membership interest in Evonik Carbon Black LLC a/k/a Degussa Engineered Carbons L.P., to Orion Engineered Carbons USA Holdco LLC as indirect subsidiary of Orion Engineered Carbons GmbH, with effective closing date July 29, 2011.

WHEREAS, the Facilities were not owned or operated by the Defendant as an indirect subsidiary of Orion Engineered Carbons GmbH until approximately end of July 2011, when they were acquired from Evonik;

WHEREAS, Evonik, as predecessor in the ownership of the Defendant, has been informed by Defendant of the terms and obligations contained in this Consent Decree;

WHEREAS, Defendant does not admit any liability to the United States or Plaintiff-State (collectively "Plaintiffs") arising out of the acts or omissions alleged in the Complaint;

WHEREAS, the Parties agree that the actions agreed to by Defendant as set forth in this Consent Decree resolve alleged violations as set forth in Paragraph 97, including allegations stated in the NOVs and Complaint relating to PSD requirements relating to failure to operate facilities without installing BACT;

WHEREAS, the Plaintiffs and Defendant (collectively "the Parties"), have extensively discussed the violations and respective defenses available as well as the terms of this settlement and have *inter alia* entered into several tolling agreements to facilitate their discussions and negotiations. Evonik was represented in such discussions and negotiations between the Parties;

WHEREAS, the Parties view the substantial relief in the Consent Decree to derive from settlement of the violations contained in all of the NOVs except for the March 22, 2016 NOV (related to specific claims at Orange) and the Complaint, and to consist of the following measures: a civil penalty (as stipulated in Section IV), the obligation to pursue certain environmental mitigation projects (as stipulated in Section V), the installation and operation of certain Control Technologies and monitoring equipment to meet certain Emission Limits and other requirements (as stipulated in Sections VI, VII, VIII), and limitations on the use of flares (as stipulated in Section IX), and the Parties view the March 22, 2016 NOV (related to specific claims at Orange) to be settled exclusively by the additional injunctive relief stipulated in Section X (Additional Requirements for the Orange Incinerator);

WHEREAS the Parties have agreed that settlement of this action is in the public interest and will result in air quality improvements, and that entry of this Consent Decree without further litigation is the most appropriate means of resolving this matter in light of the allegations made and the defenses presented; and

WHEREAS, the Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and will avoid litigation between the Parties and that this Consent Decree is fair, reasonable and in the public interest.

NOW, THEREFORE, before the taking of any testimony, without the adjudication or admission of any issue of fact or law except as provided in Section I (Jurisdiction and Venue), below, and with the consent of the Parties, IT IS HEREBY ADJUDGED, ORDERED AND DECREED as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over this action, the subject matter herein, and over the Parties consenting hereto, pursuant to 28 U.S.C. §§ 1331, 1345, 1355, and 1367, and pursuant to Sections 113, 167, and 304 of the Act, 42 U.S.C. §§ 7413, 7477, and 7604.

2. Venue lies in this district pursuant to Section 113(b) of the Act, 42 U.S.C. § 7413(b), and 28 U.S.C. § 1391(b) and (c), because some of the violations alleged in the Complaint are alleged to have occurred in, and Defendant resides in and conducts business in, this district.

3. At least 30 Days prior to the Date of Lodging of this Consent Decree, EPA notified the States of Louisiana, Ohio, and Texas, and Defendant of the violations alleged in the United States' complaint, as required by Section 113(a)(1) of the CAA, 42 U.S.C. § 7413(a)(1).

4. Solely for purposes of this Consent Decree and the underlying Complaint, and any action to enforce this Consent Decree, Defendant consents to this Court's jurisdiction over Defendant and any action to enforce this Consent Decree and to venue in this judicial district. Defendant consents to and shall not challenge entry of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree. Except as expressly provided for herein, this Consent Decree shall not create any rights in or obligations of any Party other than the Parties to this Consent Decree.

5. Except as provided in Section XXVII (Public Participation) of this Consent Decree, the Parties consent to entry of this Consent Decree without further notice.

II. APPLICABILITY

6. Upon the Effective Date, the obligations of this Consent Decree shall apply to,

and be binding upon the Plaintiffs, and upon Defendant and any successors, assigns, or other entities or persons otherwise bound by law.

7. Defendant shall condition any agreement with a Contractor retained to provide services required to comply with the provisions of this Consent Decree upon performance of the services in conformity with the provisions of this Consent Decree. In any action to enforce this Consent Decree, Defendant shall not raise as a defense the failure by any of its officers, directors, employees, agents, or Contractors to take any actions necessary to comply with the provisions of this Consent Decree. Notwithstanding any retention of any such entities to perform any work required under this Consent Decree, Defendant shall ensure that all work is performed in accordance with the requirements of this Consent Decree.

III. DEFINITIONS

8. Terms used in this Consent Decree that are defined in the Act or in regulations promulgated by EPA pursuant to the Act shall have the meanings assigned to them in the Act or such regulations, unless otherwise provided in this Decree. Whenever the terms set forth below are used in this Consent Decree, the following definitions shall apply:

a. "3-hour Average Emissions Limit" shall mean the limit on average hourly emissions specified in Paragraph 33, determined in accordance with Paragraph 33, of this Consent Decree (subject to Section XVII, Affirmative Defenses, below).

b. "7-day Rolling Average Emissions Limit" shall mean the limit on average daily emissions during the preceding seven Operating Days. For purposes of clarity, to calculate the average daily emissions to compare against the

limit, the first complete 7-day average compliance period is seven Operating Days after the Date of Continuous Operation (e.g., if the Date of Continuous Operation is January 1, the first Day in the averaging period is January 1 and the first complete 7-day average compliance period is January 1-7, provided each Day qualifies as an Operating Day), and all emissions that occur during the specified period, including emissions during all periods of Malfunction (subject to Section XVII, Affirmative Defenses, below) within an Operating Day, shall be included in the calculation.

c. "30-day Rolling Average Sulfur Content Weight Percent" shall mean the arithmetic average of weighted daily average sulfur contents in feedstock to all reactors as a weight percent during the preceding 30 Operating Days, shall equal S_{30} and shall be calculated as follows, or an alternative method approved by EPA:

$$S_{30} = \sum_{j=1}^{30} \left[\sum_{i=1}^{n} \left(\frac{100 * M_{S,i,j}}{M_{F,T,j}} \right) \right] / 30$$

Where:

$\sum_{j=1}^{30}$ = Sum from Day 1 through Day 30

n = Number of reactors at the Orange plant

$\sum_{i=1}^{n}$ = Sum for reactors 1 through n

$M_{S,i,j}$ = Mass of sulfur in the feedstock delivered to reactor i in a Day j, in pounds, as measured by a continuous mass flow monitoring system

Where:

$$M_{S,i,j} = (S_{F,i,j} * M_{F,i,j})/100$$

$S_{F,i,j}$ = The average sulfur content of the feed to reactor i in Day j, in weight percent, as derived using the sulfur contents for each feedstock storage tank feeding the reactor by Paragraph 22.a or 22.b

Where:

$$S_{F,i,j} = 100 * \sum_{k=1}^{m}(S_{T,k,j} * M_{T,k,j}) / (100 * M_{F,i,j})$$

m = Number of feedstock storage tanks at the Orange plant

$S_{T,k,j}$ = The sulfur content of the feed delivered from tank k to reactor i in Day j, in weight percent, as derived for each feedstock storage tank feeding the reactor by Paragraph 22.a or 22.b

$M_{T,k,j}$ = Total mass of feedstock delivered from tank k to reactor i in Day j, in pounds, as measured by a continuous mass flow monitoring system

$M_{F,i,j}$ = Total mass of feedstock pounds delivered to reactor i from all tanks in a calendar Day j, in pounds, as measured by a continuous mass flow monitoring system

$M_{F,T,j}$ = Total mass of feedstock delivered to all reactors in a calendar Day j, in pounds, as measured by a continuous mass flow monitoring system

Where:

$$M_{F,T,j} = \sum_{i=1}^{n} M_{F,i,j}$$

For purposes of clarity, the first complete 30-day average compliance period is 30 Operating Days after the Date of Continuous Operation (e.g., if the Date of Continuous Operation is January 1, the first Day in the averaging period is January 1 and the first complete 30-day average

compliance period is January 1 - January 30, provided each Day qualifies as an Operating Day).

d. "365-day Rolling Average Emissions Limit" shall mean the limit on average daily emissions during the preceding 365 Operating Days. For purposes of clarity, to calculate the average daily emissions to compare against the limit, the first complete 365-day average compliance period is 365 Operating Days after the Date of Continuous Operation (e.g., if the Date of Continuous Operation is January 1, the first Day in the averaging period is January 1 and the first complete 365-day average compliance period is January 1 - December 31, provided each Day qualifies as an Operating Day), and all emissions that occur during the specified period, including emissions during all periods of Malfunction within an Operating Day, shall be included in the calculation.

e. "365-day Rolling Average Sulfur Content Weight Percent" shall mean the arithmetic average of weighted daily average sulfur contents in feedstock to all reactors as a weight percent during the preceding 365 Operating Days, shall equal S_{365} and shall be calculated as follows, or an alternative method approved by EPA:

$$S_{365} = \sum_{j=1}^{365} \left[\sum_{i=1}^{n} \left(\frac{100 * M_{S,i,j}}{M_{F,T,j}} \right) \right] / 365$$

Where:

$\sum_{\square=1}^{365}$ = Sum from Day 1 through Day 365

n = Number of reactors at the Orange plant

$\sum_{i=1}^{n}$ = Sum for reactors 1 through n

$M_{S,i,j}$ = Mass of sulfur in the feedstock delivered to reactor i in a calendar Day j, in pounds, as measured by a continuous mass flow monitoring system

Where:

$$M_{S,i,j} = (S_{F,i,j} * M_{F,i,j})/100$$

$S_{F,i,j}$ = The average sulfur content of the feed to reactor i in Day j, in weight percent, as derived using the sulfur contents for each feedstock storage tank feeding the reactor by Paragraph 22.a or 22.b

Where:

$$S_{F,i,j} = 100 * \sum_{k=1}^{m}(S_{T,k,j} * M_{T,k,j}) / (100 * M_{F,i,j})$$

m = Number of feedstock storage tanks at the Orange plant

$S_{T,k,j}$ = The sulfur content of the feed delivered from tank k to reactor i in Day j, in weight percent, as derived for each feedstock storage tank feeding the reactor by Paragraph 22.a or 22.b

$M_{T,k,j}$ = Total mass of feedstock delivered from tank k to reactor i in Day j, in pounds, as measured by a continuous mass flow monitoring system

$M_{F,i,j}$ = Total mass of feedstock pounds delivered to reactor i from all tanks in a Day j, in pounds, as measured by a continuous mass flow monitoring system

$M_{F,T,j}$ = Total mass of feedstock delivered to all reactors in a calendar Day j, in pounds, as measured by a continuous mass flow monitoring system

Where:

$$M_{F,T,j} = \sum_{i=1}^{n} M_{F,i,j}$$

For purposes of clarity, the first complete 365-day average compliance period is 365 Operating Days after the Date of Continuous Operation (e.g., if the Date of Continuous Operation is January 1, the first Day in the averaging period is January 1 and the first complete 365-day average compliance period is January 1 - December 31, provided each Day qualifies as an Operating Day).

f. "365-day Rolling Sum Emissions Limit" shall mean the limit on the sum of daily emissions during the preceding 365 Days. For purposes of clarity, to calculate the sum of daily emissions to compare against the limit, the first complete 365-day compliance period is 365 Days after the Date of Continuous Operation (e.g., if the Date of Continuous Operation is January 1, the first Day in the period is January 1 and the first complete 365-day compliance period is January 1 - December 31, provided each Day qualifies as an Operating Day), and all emissions that occur during the specified period, including emissions during all periods of Malfunction within an Operating Day, shall be included in the calculation.

g. "Alternative Equivalent Pollution Control Technology" shall mean an alternative equivalent pollution control technology installed in accordance with the requirements of Paragraph 18.

h. "Belpre" shall mean Defendant's carbon black facility located at:

11135 State Route 7
Belpre, Ohio 45714-9496

i. "Belpre NO_x Cap" shall mean the cap on NO_x emissions set forth in

Paragraph 29.b. of this Consent Decree.

j. "Belpre SO_2 Cap" shall mean the cap on SO_2 emissions set forth in Paragraph 20.b. of this Consent Decree.

k. "Borger" shall mean Defendant's furnace carbon black operations at the facility located at:

19440 FM 1559, Hwy 136
Borger, Texas 79007

l. "Caps" shall mean the Belpre SO_2 Cap, the Belpre NO_x Cap, the Borger SO_2 Cap, the Borger NO_x Cap, the Ivanhoe SO_2 Cap, the Ivanhoe NO_x Cap, and the Orange NOx Cap.

m. "Borger Dryer Permit Restriction" shall mean a federally enforceable permit restriction to only use natural gas in the dryers at Borger.

n. "Borger Flare(s)" shall mean the Non-Assisted Flare(s) at Borger.

o. "Borger NO_x Cap" shall mean the cap on NO_x emissions set forth in Paragraph 29.a. of this Consent Decree.

p. "Borger SO_2 Cap" shall mean the cap on SO_2 emissions set forth in Paragraph 20.a. of this Consent Decree.

q. "Borger Waste Heat Boiler" shall mean the waste heat boiler at Borger, which combusts Tail Gas supplemented with natural gas to heat water to steam. The Borger Waste Heat Boiler is identified in the Maximum Allowable Emission Rate Table in the air permits for the facility, permits numbered 8780 and PSDTX416M1, as EPN: E-6B.

r. "Business Day" shall mean any Day, except for Saturday, Sunday, and

state and federal holidays.

s. "Calendar Year" shall mean a 12-Month period that begins on January 1 and ends on the subsequent December 31.

t. "CD Emissions Reductions" shall mean any emissions reductions that result from any projects conducted or controls used to comply with this Consent Decree except for Surplus Emission Reductions.

u. "CEMS" or "Continuous Emission Monitoring System" shall mean, for obligations involving NO_x and SO_2 under this Consent Decree, the devices designed, installed, calibrated, maintained, and operated in accordance with 40 C.F.R. § 60.13 and 40 C.F.R. Part 60 Appendices A, B and F.

v. "Clean Air Act" or "Act" shall mean the federal Clean Air Act, 42 U.S.C. §§ 7401-7671q, and its implementing regulations.

w. "Co-Generation System" shall mean a combination of one or more waste heat boilers and turbines which generates electricity from steam at a Facility. This includes the Borger Co-Generation System and the Orange Co-Generation System, as well as any such systems constructed later at Ivanhoe and Belpre. With respect to Borger, the term "Borger Co-Generation System" shall mean, the system of the Borger Waste Heat Boiler and the equipment that is connected to and receives steam from the Borger Waste Heat Boiler, which generates electricity from steam. With respect to Orange, the term "Orange Co-Generation System" shall mean, as of the date of signing this Consent Decree, the system of the Orange

Waste Heat Boiler and the equipment that is connected to and receives steam from the Orange Waste Heat Boiler, which generates electricity from steam, or, after an act to Refurbish the Orange Co-Generation System, the Refurbished Orange Co-Generation System. Only one of the Orange Co-Generation System or the Refurbished Orange Co-Generation System shall operate at Orange at a time, and that system shall be the Orange Co-Generation System for purpose of this Consent Decree.

x. "Consent Decree" or "Decree" shall mean this Decree and the Appendices attached hereto, but in the event of any conflict between the text of this Decree and any Appendix, the text of this Decree shall control.

y. "Continuously Operate" or "Continuous Operation" shall mean that, unless otherwise specified, when a Control Technology or a PM Early Warning System is used pursuant to the terms of this Consent Decree, it shall be operated at all times of Process System Operation, consistent with good engineering and maintenance practices for such Control Technology, PM Early Warning System or the Process System, as applicable, and good air pollution control practices for minimizing emissions in accordance with 40 C.F.R. § 60.11(d).

z. "Contractor" shall mean any person or entity hired by Defendant to perform design or construction services on Control Technology or Environmental Mitigation Projects on Defendant's behalf necessary to comply with the provisions of this Consent Decree.

aa. "Control Technology" shall mean each Selective Catalytic Reduction System, Selective Non Catalytic Reduction System, Wet Gas Scrubber, Dry Gas Scrubber, or Alternative Equivalent Pollution Control Technology, installed pursuant to the terms of this Consent Decree, or the PM control mechanisms identified in Appendix B of this Consent Decree.

bb. "Date of Continuous Operation" shall mean the date by which Defendant shall Continuously Operate a Control Technology on a Process System.

cc. "Date of Lodging of the Consent Decree" or "Date of Lodging" shall mean the date the Consent Decree is filed for lodging with the Clerk of the Court for the United States District Court for the Western District of Louisiana.

dd. "Day" shall mean a calendar day unless expressly stated to be a Business Day.

ee. "Defendant" or "Orion" shall mean Orion Engineered Carbons, LLC.

ff. "Dry Gas Scrubber" or "DGS" shall mean a pollution control device that removes SO_2 from flue gas by injecting a reagent in one or more absorber vessels designed to provide intimate contact and to react with and remove SO_2 from the flue gas stream forming a dry particulate containing reaction products and unreacted reagent which is captured in a particulate control device.

gg. "Dryer" shall mean a dryer fired by natural gas or Tail Gas in which carbon black is dried.

hh. "Dryer Exhaust Bag Filter" shall mean a high-efficiency fabric filtration unit which, during periods of carbon black production, receives water vapor, combusted by-product gases, and carbon black from the carbon black pellet dryer and separates the carbon black from the water vapor and combusted Tail Gases.

ii. "Effective Date" shall have the meaning set forth in Section XXIII (Effective Date).

jj. "Emissions Limit" shall mean the maximum allowable emissions in units as specified in this Consent Decree, measured in accordance with this Consent Decree, met to the number of significant digits in which the limit is expressed. For example, an Emissions Limit of 0.100 is not met if the actual emission is 0.101. The fourth significant digit shall be rounded to the nearest third significant digit, or the third significant digit to the nearest second significant digit, depending upon whether the limit is expressed to three or two significant digits. For example, if an actual emission is 0.1004, that shall be reported as 0.100, and shall be in compliance with an Emissions Limit of 0.100, and if an actual Emissions Limit is 0.1005, that shall be reported as 0.101, and shall not be in compliance with an Emissions Limit of 0.100. The following Emissions Limits are specified in this Consent Decree: 3-hour Average Emissions Limit, 7-day Rolling Average Emissions Limit, 365-day Rolling Average Emissions Limit, 365-day Rolling Sum Emissions Limit, Final 7-day

Rolling Average Emissions Limit, Final 365-day Rolling Average Emissions Limit, Interim 7-day Rolling Average Emissions Limit, Interim 365-day Rolling Average Emissions Limit.

kk. "EPA" shall mean the United States Environmental Protection Agency and any of its successor departments or agencies.

ll. "EPN" shall mean "Emissions Point Number" as that term is used in the Maximum Allowable Emission Rate Table in the air permits for Borger and Orange.

mm. "Environmental Mitigation Project" shall mean a project implemented by Defendant as a remedial measure to mitigate alleged harm to human health or the environment claimed to have been caused by the alleged violations described in the Complaint.

nn. "Facilities" shall mean Belpre, Ivanhoe, Borger, and Orange, the Defendant's facilities used primarily for the manufacture of carbon black, each of which may be referred to as a "Facility."

oo. "Final 7-day Rolling Average Emissions Limit" shall mean the applicable Final 7-day Rolling Average Emissions Limit set forth in the table in Paragraph 16 or Paragraph 26.

pp. "Final 365-day Rolling Average Emissions Limit" shall mean the applicable Final 365-day Rolling Average Emissions Limit set forth in the table in Paragraph 16 or Paragraph 26.

qq. "Flare" shall mean a combustion device that uses an uncontrolled volume

of ambient air to burn Tail Gases.

rr. "gr/dscf" shall mean grains per dry standard cubic foot.

ss. "Heat Load Operation" shall mean the operation of any carbon black reactor at a Facility under any of four conditions: (1) when there is no oil feed but only natural gas (and/or liquefied petroleum gas) and combustion air supplied to the reactor burner, and the reactor is not manufacturing carbon black and generating Tail Gas, including, but not limited to, during periods of Startup and Shutdown, (2) during the periods either prior to or at the conclusion of Process System Operation, each of which shall be as short as practicable and shall not exceed 13 minutes, when transitioning between (A) an operational mode in which oil, natural gas (and/or liquefied petroleum gas), and combustion air are all fed to the reactor burner and the reactor is manufacturing carbon black and generating Tail Gas, and (B) an operational mode, including, but not limited to, during periods of Startup and Shutdown, in which no oil but only natural gas (and/or liquefied petroleum gas) and combustion air are supplied to the reactor, (3) at a boiler, when there is no oil feed to the reactors but only natural gas (and/or liquefied petroleum gas) and combustion air (and not Tail Gas generated by a reactor during Process System Operation) are fed to the boiler, including, but not limited to, periods of Startup and Shutdown, or (4) at a dryer combustor during times other than Process System Operation, when only natural gas (and/or liquefied petroleum gas)

and combustion air (and not Tail Gas generated by a reactor during Process System Operations) are fed to the dryer combustor, including, but not limited to, during periods of Startup and Shutdown.

tt. "Inspection at the Co-Generation System" shall mean an outage at a Facility's Co-Generation System to inspect and maintain the relevant Co-Generation System. For purposes of Section IX (Limitation on Use of Flares) of this Decree, the outage shall not exceed 168 hours in duration and may not be conducted more frequently than once per Calendar Year, but never closer than nine months apart, except that one outage that shall not exceed 744 hours in duration may be conducted not more frequently than once every five Calendar Years, as necessary to comply with American Society for Testing and Materials and insurance requirements.

uu. "Interim 7-day Rolling Average Emissions Limit" shall mean the applicable Interim 7-day Rolling Average Emissions Limit set forth in the table in Paragraph 16 or Paragraph 26.

vv. "Interim 365-day Rolling Average Emissions Limit" shall mean the applicable Interim 365-day Rolling Average Emissions Limit set forth in the table in Paragraph 16 or Paragraph 26.

ww. "Ivanhoe" shall mean Defendant's carbon black facility located at:

7095 Highway 83
Franklin, LA, 70538

xx. "Ivanhoe NO_x Cap" shall mean the cap on NO_x emissions set forth in Paragraph 29.c. of this Consent Decree.

yy. "Ivanhoe SO_2 Cap" shall mean the cap on SO_2 emissions set forth in Paragraph 20.c. of this Consent Decree.

zz. "LDEQ" shall mean the Louisiana Department of Environmental Quality.

aaa. "Main Unit Filter" shall mean a high-efficiency fabric filtration unit, equipped with membrane bag filters or their equivalent, which, during periods of carbon black production, receives a combined stream of carbon black and Tail Gas from the reactor and separates the carbon black from the Tail Gas. Carbon black collected by the Main Unit Filter is conveyed to the Process Filter via a pneumatic conveying system, while the separated Tail Gas is directed to a combustion device.

bbb. "Malfunction" as used in this Consent Decree shall have the same meaning as defined at 40 C.F.R. § 60.2.

ccc. "Method 9" shall mean the methodology in 40 C.F.R. Part 60, Appendix A.

ddd. "Method 9 Trained Observer" shall mean a person who is trained in conducting visual assessments pursuant to Method 9.

eee. "Method for Managing PM Emissions" shall mean the method for managing PM emissions identified in the third column of Appendix B.

fff. "Month" shall mean a calendar month.

ggg. "Notices of Violation" or "NOVs" shall mean the notices of violation issued by the EPA on June 30, 2010 (to Degussa Engineered Carbons L.P.) and on October 10, 2012, January 11, 2013, February 28, 2013, and

March 22, 2016 (to Orion).

hhh. "National Ambient Air Quality Standards" or "NAAQS" shall mean national ambient air quality standards that are promulgated pursuant to Section 109 of the Act, 42 U.S.C. § 7409.

iii. "NO_x" shall mean oxides of nitrogen, measured in accordance with the provisions of this Consent Decree.

jjj. "Non-Assisted Flare" shall mean a Flare that is not assisted by steam or by air.

kkk. "Nonattainment NSR" shall mean the nonattainment area New Source Review program within the meaning of Part D of Subchapter I of the Act, 42 U.S.C. §§ 7501-7515, 40 C.F.R. Part 51, and any applicable State Implementation Plan.

lll. "Operating Day" shall mean any Day of Process System Operation.

mmm. "Orange" shall mean Defendant's carbon black facility located at:

1513 Echo Avenue
Orange, Texas 77632-2059

nnn. "Orange Incinerator" shall mean, as of the date of signing this Consent Decree, the VOC Incinerator at Orange, identified in the Maximum Allowable Emission Rate Table in the air permits numbered 9403B and PSDTX627M2, as EPN 1-INC, or, after an act to Rebuild the Orange Incinerator, the Rebuilt Orange Incinerator. Only one of the Orange Incinerator or the Rebuilt Orange incinerator shall operate at Orange at a time, and that incinerator shall be the Orange Incinerator for purposes of

this Consent Decree. Only the Rebuilt Orange Incinerator shall operate at Orange after an act to Rebuild the Orange Incinerator. Rebuilt Orange Incinerator shall mean the incinerator at Orange that replaces the Orange Incinerator after an act to Rebuild the Orange Incinerator.

ooo. "Orange NOx Cap" shall mean the cap on NO_x emissions set forth in Paragraph 31 of this Consent Decree.

ppp. "Orange Waste Heat Boiler" shall mean the waste heat boiler at Orange, which combusts Tail Gas to heat water to steam that is used in the Orange Co-Generation System.

qqq. "Paragraph" shall mean a portion of this Decree identified by an Arabic numeral.

rrr. "Particulate Emissions Best Management Practices Control Plan" shall mean the plan for identifying sources of particulate emissions and the measures to reduce such emissions that is reflected in Appendix C to this Consent Decree.

sss. "Parties" shall mean the United States, Plaintiff-State, and Defendant.

ttt. "Party" shall mean one of the Parties.

uuu. "Plaintiffs" shall mean the United States and Plaintiff-State.

vvv. "Plaintiff-State" shall mean LDEQ.

www. "PM" shall mean the pollutant filterable particulate matter with a diameter of any size, measured in accordance with Paragraph 34 of this Consent Decree.

xxx. "PM Early Warning System" shall mean a probe electrification-type technology (i.e., a system in which a probe is inserted into the emissions stream and measures the momentum, and/or other relevant property, of the PM flowing through the duct), or a monitoring system designed to achieve an equivalent level of performance to a probe electrification-type technology that has been approved in advance of use by the EPA, that provides early warning detection of excess PM emissions from carbon black production operations by producing a signal that is transmitted to an alarm management system and converted into a numeric readout, over an averaging period of no longer than 15 minutes, as described in Appendix D to this Consent Decree.

yyy. "PM Emissions Equipment" shall mean the PM emissions equipment identified in the first column of Appendix B.

zzz. "PM Monitor Point" shall mean the point at which a probe or other monitoring device of the PM Early Warning System is inserted into the emissions stream and measures the momentum, and/or other relevant property, of the PM flowing through the duct from each of the Main Unit Filters, Process Filters, Purge Filters, and Dryers.

aaaa. "PM Reduction Mechanism" shall mean the PM reduction mechanism identified in the middle column of Appendix B.

bbbb. "ppmvd" means parts per million, volumetric dry.

cccc. "Process Filter" shall mean a high efficiency fabric filtration unit equipped

with a membrane bag filter or its equivalent, which separates carbon black from the conveying stream and routes the carbon black to grinders, pelletizers, or other finishing steps.

dddd. "Process System" shall mean, collectively, all Tail Gas generating and Tail Gas combustion equipment, including, all feedstock heaters, preheaters, reactors, dryers, thermal oxidizers, incinerators, and boilers, and all ancillary equipment, necessary for the manufacture of carbon black, at a designated Facility.

eeee. "Process System Operation" shall mean the operation of any Process System when there is oil feed to any reactor burners within such Process System, and the reactor is manufacturing carbon black. Process System Operation ends when oil feed to the reactor burners within such Process System ceases; provided however that any period of operation meeting the definition of Heat Load Operation shall not constitute Process System Operation.

ffff. "Project Dollars" shall mean Defendant's expenditures and payments incurred or made in carrying out the Environmental Mitigation Projects identified in Section V and Appendix A (Environmental Mitigation Projects) of this Consent Decree to the extent that such expenditures or payments both: (a) comply with the requirements set forth in Section V (Environmental Mitigation Projects) and Appendix A of this Consent Decree, and (b) constitute Defendant's direct payments for such projects,

or Defendant's external costs for Contractors, vendors, and equipment. Defendant shall not include its own personnel costs in overseeing the implementation of the Environmental Mitigation Projects as Project Dollars.

gggg. "PSD" shall mean Prevention of Significant Deterioration program within the meaning of Part C of Subchapter I of the Clean Air Act, 42 U.S.C. §§ 7470-7492, 40 C.F.R. Part 52, and any applicable State Implementation Plan.

hhhh. "Purge Filter" shall mean a high-efficiency fabric filtration unit which, during periods of carbon black production, receives water vapor, air, and carbon black from the Dryer, fluid bed cooler or screeners and separates the carbon black from the water vapor and air.

iiii. "Reactor Sample Device" shall mean an apparatus which receives small quantities of carbon black and process gas from the reactor breaching before the main bag collector and separates the carbon black product from the process gas to allow for efficient quality control testing during grade changes.

jjjj. "Reactor Vent Scrubber" shall mean a two-stage scrubber employing water as the scrubber medium, with the first stage consisting of a venturi device and the second stage consisting of a spray tower/demister.

kkkk. "Rebuild the Orange Incinerator" means the re-design and modification of the VOC Incinerator in place at Orange as of the date of signing this

Consent Decree to a state in which it (1) can be stack tested in accordance with the requirements of Paragraph 40 and Appendix E, and (2) a SCR and CEMS can be installed and Continuously Operated on it to meet the requirements of Paragraphs 26 – 29 and 31 of this Consent Decree. The effort to Rebuild the Orange Incinerator may include major renovations up to and including the construction of a new incinerator with equivalent capacity to burn Tail Gas as the VOC Incinerator, which would replace the VOC Incinerator. Any act to Rebuild the Orange Incinerator shall be in compliance with the emission limits in place at Orange as of the date of signing this Consent Decree.

llll. "Refurbish the Orange Co-Generation System" means the repair, rebuilding or replacement of the Orange Co-Generation System to a state in which it (1) can generate electricity from the steam that results from the combustion of some or all of the Tail Gas that, as of the date of signing this Consent Decree, is being sent to the Orange Incinerator, and (2) a SCR that can be installed and Continuously Operated on each boiler that constitutes a part of the Orange Co-Generation System to meet the requirements of Paragraphs 26 – 29 and 31 – 32. Any act to Refurbish the Orange Co-Generation System shall be in compliance with the emission limits in place at Orange as of the date of signing this Consent Decree.

mmmm. "Refurbished Orange Co-Generation System" shall mean the system of the Orange Waste Heat Boiler and the equipment that is

connected to and receives steam from those boilers, which generates electricity from steam.

nnnn. "Section" shall mean a portion of this Decree identified by a capitalized Roman numeral.

oooo. "Selective Catalytic Reduction System" or "SCR" shall mean a pollution control system that employs anhydrous, aqueous ammonia or urea reagent injection and a catalyst to speed the reaction of the reagent with NO_x and to drive the reaction to greater completion, for the purpose of reducing NO_x emissions;

pppp. "Shutdown" shall mean the period of ceasing of operation of a Facility for any purpose, and shall be limited to an operational mode in which no oil and only natural gas (and/or liquefied petroleum gas) and combustion air are supplied to the reactor (or, in the case of permanent Shutdown, no operations).

qqqq. "SO_2" shall mean the pollutant sulfur dioxide, measured in accordance with the provisions of this Consent Decree.

rrrr. "Startup" shall mean the period of setting in operation of a Facility for any purpose, and shall be limited to an operational mode in which no oil and only natural gas (and/or liquefied petroleum gas) and combustion air are supplied to the reactor.

ssss. "Surplus Emission Reductions" shall mean reductions in an Emissions Limit, 30-day Rolling Average Sulfur Content Weight Percent, and/or

365-day Rolling Average Sulfur Content Weight Percent over and above (i.e., more stringent then) those required to comply with the requirements of this Consent Decree (including permanent Shutdown of a facility, but excluding any reductions in SO2 at Borger), to the extent that such reduced Emissions Limit, 30-day Rolling Average Sulfur Content Weight Percent, and/or 365-day Rolling Average Sulfur Content Weight Percent is reflected in a federally enforceable emissions limit or requirement.

tttt. "Tail Gas" shall mean the gaseous by-product of the carbon black process, which is generated during periods when there is oil feed to a reactor burner.

uuuu. "TCEQ" shall mean the Texas Commission on Environmental Quality.

vvvv. "Title V permit" shall mean a permit required by and issued in accordance with the requirements of 42 U.S.C. §§ 7661 - 7661f.

wwww. "United States" shall mean the United States of America, acting on behalf of EPA.

xxxx. "Wet Gas Scrubber" and "WGS" shall mean a pollution control device that removes SO_2 and PM from flue gas through contact with a caustic scrubbing liquid.

IV. CIVIL PENALTY

9. Within 30 Days after the Effective Date of this Consent Decree, Defendant shall pay to the United States a civil penalty of $533,333.33. Failure to timely pay the civil penalty

shall subject Defendant to interest accruing from the date payment is due until the date payment is made at the rate prescribed by 28 U.S.C. § 1961, and shall render Defendant liable for all charges, costs, fees, and penalties established by law for the benefit of a creditor or of the United States in securing payment. Defendant shall make the above referenced payment by FedWire Electronic Funds Transfer ("EFT" or wire transfer) to the United States Department of Justice account in accordance with current electronic funds transfer procedures, referencing DOJ Case No. 90-5-2-1-10189. Payment shall be made in accordance with instructions provided to Defendant by the Financial Litigation Unit of the United States Attorney's Office for the Western District of Louisiana. Any payments received by the Department of Justice after 4:00 P.M. (Central Time) will be credited on the next Business Day. At the time of payment, Defendant shall send a copy of the EFT authorization form and the EFT transaction record, together with a transmittal letter, which shall state that the payment is for the civil penalty owed pursuant to the Consent Decree in *United States, et al. v. Defendant Orion Engineered Carbons, LLC*, and shall reference the civil action number and DOJ case number 90-5-2-1-10189, to the United States in accordance with Section XXII (Notices); by email to acctsreceivable.CINWD@epa.gov; and to:

EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

10. Within 30 Days after the Effective Date of this Consent Decree, Defendant shall pay to LDEQ a civil penalty of $266,666.67. If any portion of the civil penalty due to LDEQ is not paid when due, Defendant shall pay interest on the amount past due, accruing from the Effective Date through the date of payment at the rate identified in Paragraph 9 above, by

certified check made payable to the Louisiana Department of Environmental Quality and sent to Fiscal Director, Office of Management and Finance, LDEQ, P.O. Box 4303, Baton Rouge, Louisiana 70821-4303, or by EFT to the Louisiana Department of Environmental Quality in accordance with written instructions to be provided to Defendant upon request.

11. Defendant shall not deduct any penalties paid under this Section or Section XV (Stipulated Penalties) in calculating its federal or state or local income tax.

V. ENVIRONMENTAL MITIGATION

12. Defendant shall implement the Environmental Mitigation Projects described in Appendix A of this Consent Decree, in compliance with the schedules for such Environmental Mitigation Projects and the other terms of this Consent Decree. In implementing the Environmental Mitigation Projects, Defendant shall spend no less than a total of $550,000 in Project Dollars, in the aggregate, for all Environmental Mitigation Projects.

13. All reports prepared by Defendant pursuant to the requirements of this Section of the Consent Decree and required to be submitted to EPA and the applicable Plaintiff-State shall be publicly available (subject to the provisions of Paragraph 95 of this Consent Decree) from Defendant without charge.

14. In accordance with Section XIV (Recordkeeping and Reporting Requirements), Defendant shall certify, within 30 Days before the start of any Environmental Mitigation Project, that Defendant is not otherwise required by law to perform the Environmental Mitigation Projects, that Defendant is unaware of any other person who is required by law to perform the Environmental Mitigation Projects, and that Defendant will not use any Environmental

Mitigation Projects, or portion thereof, to satisfy any obligations that it may have under other applicable requirements of law that are in effect or finalized, but not yet in effect.

15. Defendant shall maintain, and upon Plaintiffs' request, provide to Plaintiffs within 60 Days of such request, all documents that substantiate the work completed on the Environmental Mitigation Projects and the Project Dollars expended to implement the Environmental Mitigation Projects in accordance with Sections XXII (Notices) and XIX (Information Collection and Retention).

VI. SO_2 CONTROL TECHNOLOGY, EMISSIONS LIMITS, AND MONITORING REQUIREMENTS

16. SO_2 Process System Operation Emissions Limits and Control Technology. No later than the dates set forth in the table below, Defendant shall install, and continuing thereafter, Defendant shall Continuously Operate, a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology on each Process System specified in the table below so as to achieve and maintain during Process System Operation the SO_2 Emissions Limits specified in the table below. Defendant has the option to install such Control Technology at either Belpre or Borger. Defendant shall notify EPA in writing no later than April 30, 2021 whether it elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre (and not Borger) or at Borger (and not Belpre) by the applicable date specified in the table below. This election shall be at Defendant's sole discretion.

Process System	**Control Technology**	**7-day Rolling Average Emissions Limit**	**365-day Rolling Average Emissions Limit**	**Date of Continuous Operation**
Ivanhoe Process System	WGS, DGS, or Alternative Equivalent Pollution Control Technology	Interim 7-day Rolling Average Emissions Limit: No greater than 158 ppmvd (at 0% oxygen)	Interim 365-day Rolling Average Emissions Limit: No greater than 130 ppmvd (at 0% oxygen)	Applicable interim Emissions Limit: 4/1/21
		Final 7-day Rolling Average Emissions Limit: No greater than 120 ppmvd (at 0% oxygen)	Final 365-day Rolling Average Emissions Limit: No greater than 80 ppmvd (at 0% oxygen)	Applicable final Emissions Limit: 9/1/21
Belpre Process System or Borger Process System	WGS, DGS, or Alternative Equivalent Pollution Control Technology	Interim 7-day Rolling Average Emissions Limit: No greater than 158 ppmvd (at 0% oxygen)	Interim 365-day Rolling Average Emissions Limit: No greater than 130 ppmvd (at 0% oxygen)	Applicable interim Emissions Limit: 12/31/22
		Final 7-day Rolling Average Emissions Limit: No greater than 120 ppmvd (at 0% oxygen)	Final 365-day Rolling Average Emissions Limit: No greater than 80 ppmvd (at 0% oxygen)	Applicable final Emissions Limit: 6/30/23

17. Design Specifications. Defendant shall submit to EPA the process design specifications for each WGS, DGS, or Alternative Equivalent Pollution Control Technology no later than 18 months prior to the first date of Continuous Operation of the Control Technology of the WGS, DGS, or Alterative Equivalent Pollution Control Technology in accordance with the notice provisions of Section XXII (Notices) of this Consent Decree. Each WGS, DGS, or

Alternative Equivalent Pollution Control Technology shall be designed to achieve a minimum removal of at least 95% of SO_2 emissions at all times at the applicable Process System to meet the requirements of Paragraph 16. For purposes of clarity, the design criteria in this Paragraph shall not be construed to limit the sulfur concentration of the feedstock used at the Facilities covered by Paragraph 16.

18. SO_2 Alternative Equivalent Pollution Control Technology. Alternatively, notwithstanding any provision of this Consent Decree to the contrary, no later than the applicable dates set forth in Paragraph 16, Defendant may install, and continuing thereafter shall Continuously Operate, an Alternative Equivalent Pollution Control Technology that is at least as effective as a WGS or DGS, so as to achieve and maintain the applicable Emissions Limits specified in Paragraph 16, provided there has been prior written notice to EPA and the applicable Plaintiff-State in accordance with the notice provisions of Section XXII (Notices) of this Consent Decree, no later than the applicable date set forth in Paragraph 17.

19. SO_2 Monitoring Requirements. Beginning no later than the dates specified in the table in Paragraph 16, Defendant shall use a CEMS (in accordance with the terms of this Paragraph) to monitor the performance during Process System Operation of each Process System specified therein and to report compliance with the terms and conditions of this Consent Decree. Defendant shall install, calibrate, certify, maintain and operate all CEMS in accordance with the reference methods specified in 40 C.F.R. § 60.13 that are applicable to CEMS, and Part 60, Appendixes A and F, and the applicable performance specification test of 40 C.F.R. Part 60, Appendix B, to demonstrate compliance with all Emissions Limits specified in this Consent Decree.

20. SO_2 Caps.

a. Borger SO2 Cap. If, pursuant to Paragraph 16, Defendant elects to install WGS, DGS, or Alternative Equivalent Pollution Control Technology at Belpre, but not Borger, Defendant shall comply with a Borger SO_2 Cap of 4714 tons per year by December 31, 2023 (i.e., the first day included in the first year is January 1, 2024). If, pursuant to Paragraph 16, Defendant elects to install WGS, DGS, or Alternative Equivalent Pollution Control Technology at Borger, but not Belpre, Defendant shall comply with a Borger SO2 Cap of 475 tons per year by December 31, 2022 (i.e., the first day included in the first year is January 1, 2023). For purposes of determining compliance with the Borger SO_2 Cap, SO_2 emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 19, and by calculating emissions pursuant to Appendix F.

b. Belpre SO2 Cap. If, pursuant to Paragraph 16, Defendant elects to install WGS, DGS, or Alternative Equivalent Pollution Control Technology at Belpre, but not Borger, Defendant shall comply with a Belpre SO_2 Cap of 355 tons per year by December 31, 2022 (i.e., the first day included in the first year is January 1, 2023). If, pursuant to Paragraph 16, Defendant elects to install WGS, DGS, or Alternative Equivalent Pollution Control Technology at Borger, but not Belpre, Defendant shall comply with a Belpre SO2 Cap of 3525 tons per year by December 31, 2023 (i.e., the first day included in the first year is January 1, 2024). For purposes of

determining compliance with the Belpre SO_2 Cap, SO_2 emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 19, and by calculating emissions pursuant to Appendix F.

c. Ivanhoe SO2 Cap. Defendant shall comply with an Ivanhoe SO_2 Cap of 850 tons per year by April 1, 2021 (i.e., the first day included in the first year is April 1, 2021). For purposes of determining compliance with the Ivanhoe SO_2 Cap, SO_2 emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 19, and by calculating emissions pursuant to Appendix F.

Nothing in this Consent Decree shall be construed to prohibit any state permitting authority from issuing plantwide applicability limits for any of the Facilities subject to the Decree.

21. Other SO_2 Requirements at Orange. No later than the dates set forth in the table below, and continuing thereafter, at all times of Process System Operation at Orange, Defendant shall process carbon black feedstock with a sulfur content of no greater than the weight specified in the table below:

Process System	**30-day Rolling Average Sulfur Content Weight Percent**	**365-day Rolling Average Sulfur Content Weight Percent**	**Date**
Orange Process System	2.5%	2.25%	12 Months after the Effective Date through August 31, 2020
Orange Process System	2.25%	2.0%	September 1, 2020

22. Feedstock Sulfur Content Monitoring Requirements. Beginning no later than the dates specified in the table in Paragraph 21, Defendant shall demonstrate compliance with the terms and conditions of Paragraph 21 by:

a. at least once per calendar week, analyzing the sulfur content of the feedstock in each storage tank on a weight % basis and the liquid density in pounds per gallon (lb/gallon), or

b. within one Business Day of each feedstock delivery, calculating the feedstock sulfur content of each tank, through the following equation:

$$S_T = \frac{VS\rho + V_1 S_1 \rho_1}{V\rho + V_1 \rho_1}$$

Where:

S_T = Tank-specific feedstock sulfur content, after the delivery of feedstock into the tank, weight %

V = Volume of the feedstock in the tank, prior to the delivery of feedstock into the tank, gallons

S = Sulfur content of the feedstock in the tank, prior to the delivery of feedstock into the tank, weight %

ρ = Liquid density of the feedstock in the tank, prior to the delivery of feedstock into the tank, lb/gallon

V_1 = Volume of feedstock delivered into the tank, gallons

S_1 = Sulfur content of the feedstock delivered into the tank as certified by the feedstock supplier, weight %

ρ_1 = Liquid density of the feedstock delivered into the tank as certified by the feedstock supplier, lb/gallon

VII. NO_x CONTROL TECHNOLOGY, EMISSIONS LIMITS, AND

MONITORING REQUIREMENTS

23. NOx Emissions Limits Applicable to Heat Load Operation, Startup, and Shutdown. No later than the dates set forth in the table below, and continuing thereafter, Defendant shall operate the reactors and boilers at each Facility to collectively achieve and maintain the Emissions Limits specified in the table below, at all times, collectively, of Heat Load Operation, Startup, and Shutdown:

Facility	**365-day Rolling Sum Emissions Limit**	**Date of Continuous Operation**
Orange	No greater than 50 tons (in total for all reactors and boilers) for the prior 365 Days	6/30/19
Ivanhoe	No greater than 65 tons (in total for all reactors and boilers) for the prior 365 Days	4/1/21
Belpre	No greater than 50 tons (in total for all reactors and boilers) for the prior 365 Days	12/31/22 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise 12/31/23
Borger	No greater than 50 tons (in total for all reactors and boilers) for the prior 365 Days	12/31/23 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise 12/31/22

24. Heat Load Operation, Startup, and Shutdown Compliance Calculation. Beginning no later than the dates specified in the table in Paragraph 23, and continuing daily thereafter, to evaluate compliance with the applicable 365-day Rolling Sum Emissions Limit specified in Paragraph 23, Defendant shall perform the following calculation, for each Day, summing as described, to derive cumulative NO_x emissions in tons:

$$X = \left(\sum_{i=1}^{365} \left[\frac{\varphi * \text{consumption}_i}{2000\ lbs} \right] \right)$$

Where:

"X" = cumulative NO_x emissions (tons) during preceding 365 Days

"φ" = 0.48 lbs NO_x/MMBtu

"i" = each Day in the preceding 365 Days

consumption_i = the amount of energy input from fuel and feedstock (in MMBtu) to the Process System per Day for each Day *i* of Heat Load Operation, Startup, or Shutdown. For any Day in which no Heat Load Operation, Startup, or Shutdown occur, consumption_i shall equal zero.

25. Alternative Heat Load Operation, Startup, and Shutdown Compliance Calculation. As an alternative to the calculation in Paragraph 24, beginning no later than the dates specified in the table in Paragraph 23, and continuing daily thereafter, to evaluate compliance with the applicable 365-day Rolling Sum Emissions Limit specified in Paragraph 23, Defendant may perform an alternative calculation, for each Day, to derive daily NO_x emissions in tons as a sum for the prior 365 Days, provided there has been prior written request by Defendant, which specifies the basis for the derivation of such alternative calculation no later than 24 Months from the Effective Date of the Consent Decree, and written approval of such alternative calculation pursuant to Section XIII (Review and Approval of Submittals) of this Consent Decree by EPA.

26. NO_x Process System Operation Emissions Limits and Control Technology. No later than the dates set forth in the table below, Defendant shall design and install, and continuing thereafter, Defendant shall Continuously Operate, a SCR on each Process System or equipment as specified in the table below so as to achieve and maintain during Process System Operation the NO_x Emissions Limits specified in the table below:

Equipment	**Control Technology**	**7-day Rolling Average Emissions Limit**	**365-day Rolling Average Emissions Limit**	**Date of Continuous Operation**
Ivanhoe Process System	SCR	No greater than 55 ppmvd (at 0% oxygen)	No greater than 39 ppmvd (at 0% oxygen)	4/1/21
Belpre Process System	SCR	No greater than 55 ppmvd (at 0% oxygen)	No greater than 39 ppmvd (at 0% oxygen)	12/31/22 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise 12/31/23
Orange Incinerator (as defined in Paragraph 8.nnn) or, if Defendant operates the Orange Co-Generation System after June 30, 2019, the Orange Waste Heat Boiler	SCR	No greater than 55 ppmvd (at 0% oxygen)	No greater than 39 ppmvd (at 0% oxygen)	6/30/19

Equipment	Control Technology	7-day Rolling Average Emissions Limit	365-day Rolling Average Emissions Limit	Date of Continuous Operation
Borger Process System	SCR	No greater than 55 ppmvd (at 0% oxygen)	No greater than 39 ppmvd (at 0% oxygen)	12/31/23 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise 12/31/22

27. SCR Design Specifications. Defendant shall submit to EPA the process design specifications for each SCR specified in the table in Paragraph 26 no later than 18 Months prior to the first date of Continuous Operation of the Control Technology of the SCR. Each SCR shall be designed to achieve a minimum of 90% removal of NO_x emissions at all times at the applicable Process System (Ivanhoe, Belpre, and Borger) or equipment (Orange), as specified in the table in Paragraph 26.

28. NO_x Monitoring Requirements. Beginning no later than the dates specified in the table in Paragraph 26, Defendant shall use a NO_x CEMS (in accordance with the terms of this Paragraph) to monitor performance of each Process System (Ivanhoe, Belpre, and Borger) or equipment (Orange) specified therein and to report compliance with the terms and conditions of this Consent Decree. Defendant shall install, calibrate, certify, maintain, and operate all NO_x CEMS in accordance with the reference methods specified in 40 C.F.R. § 60.13 that are

applicable to CEMS, and Part 60, Appendixes A and F, and the applicable performance specification test of 40 C.F.R. Part 60, Appendix B, to demonstrate compliance with all Emissions Limits for NO_x specified in this Consent Decree.

29. Borger, Belpre, and Ivanhoe NO_x Caps.

a. Borger NOx Cap. Defendant shall comply with an interim Borger NOx Cap of 551 tons per year by December 31, 2023 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise by December 31, 2022. Defendant shall comply with a final Borger NO_x Cap of 290 tons per year by December 31, 2024 (i.e., the first day included in the first year is January 1, 2025) if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise by December 31, 2023. For purposes of determining compliance with the Borger NO_x Cap, NO_x emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 28, and by calculating emissions pursuant to Appendix F.

b. Belpre NOx Cap. Defendant shall comply with a Belpre NO_x Cap of 95 tons per year by December 31, 2022 (i.e., the first day included in the first year is January 1, 2023) if pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise by December 31, 2023. For purposes of determining compliance with the Belpre NO_x Cap, NO_x emissions shall be determined by

measuring emissions using a CEMS in accordance with Paragraph 28, and by calculating emissions pursuant to Appendix F.

c. Ivanhoe NOx Cap. Defendant shall comply with an Ivanhoe NO_x Cap of 205 tons per year by April 1, 2021 (i.e., the first day included in the first year is April 1, 2021). For purposes of determining compliance with the Ivanhoe NO_x Cap, NO_x emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 28, and by calculating emissions pursuant to Appendix F.

30. Additional Operational Restrictions at Borger. Beginning no later than 60 Days after the Effective Date, Defendant shall only use natural gas as a fuel for its Dryers at Borger and shall submit an application for the Borger Dryer Permit Restriction.

31. Orange NOx Cap. Defendant shall comply with an interim Orange NOx Cap of 619 tons per year by June 30, 2019. Defendant shall comply with a final Orange NO_x Cap of 378 tons per year by July 1, 2020. For purposes of determining compliance with an Orange NO_x Cap, NO_x emissions shall be determined by measuring emissions using a CEMS in accordance with Paragraph 28, and by calculating emissions pursuant to Appendix F.

32. Restrictions on Use of Orange Co-Generation System. If Defendant operates the Orange Co-Generation System after June 30, 2019, it shall only do so after installing and thereafter Continuously Operating a SCR on the Orange Co-Generation System that meets the requirements of Paragraphs 26 – 32.

VIII. PM CONTROL TECHNOLOGY, EMISSIONS LIMITS, BEST MANAGEMENT PRACTICES, AND EARLY WARNING SYSTEM REQUIREMENTS

33. PM Control Technology and Emissions Limits. No later than the dates set forth in

the table below, Defendant shall install, and continuing thereafter, Defendant shall Continuously Operate, a WGS, DGS, or Alternative Equivalent Pollution Control Technology on each Process System specified in the table below so as to achieve and maintain the Emissions Limits specified in the table below. The Emission Limits shall apply at Ivanhoe and, between either Belpre or Borger, the Facility at which Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology pursuant to the notice provided in Paragraph 16 (i.e., the Emission Limits shall apply at either Belpre or Borger, but not both).

Process System	**Control Technology**	**3-hour Average Emissions Limit for PM**	**Date of Continuous Operation**
Ivanhoe	WGS, DGS, or Alternative Equivalent Pollution Control Technology	No greater than 0.0069 gr/dscf	4/1/21
Belpre or Borger	WGS, DGS, or Alternative Equivalent Pollution Control Technology	No greater than 0.0069 gr/dscf	12/31/22

34. PM Stack Testing Requirements. Beginning no later than the dates specified in the table in Paragraph 33, and continuing annually thereafter, Defendant shall conduct a stack test for PM for each Process System to which the table in Paragraph 33 applies (i.e., Ivanhoe and either Belpre or Borger) to report compliance with the terms and conditions of this Consent Decree. No two annual tests shall be conducted less than 11 Months apart. The reference methods and procedures for performing PM stack tests and for determining compliance with the applicable PM 3-hour Average Emissions Limit shall be those specified in 40 C.F.R. § 60.8(f) and 40 C.F.R. Part 60, Appendix A-3, Reference Method 5/5B. Each test shall consist of three

separate runs performed under representative operating conditions, not including periods of Startup, Shutdown, or Malfunction. The sampling time for each run shall be at least 60 minutes and the minimum sample volume of each run shall be 30 ft^3 (dry volume, standard temperature basis).

35. Other PM Control Requirements. For all PM Emissions Equipment identified in Appendix B to this Consent Decree, Defendant shall Continuously Operate the associated PM Reduction Mechanism in accordance with the Method for Managing PM Emissions identified therein. Except as identified below, starting no later than 60 Days after the Effective Date of this Consent Decree, once each Operating Day, Defendant shall conduct a visual assessment of the emissions from each piece of PM Emissions Equipment identified in Appendix B to this Consent Decree to determine if there are any detectable visible emissions. Requirements in this Paragraph applicable to the reactors identified in Appendix B shall not take effect until 18 Months after the Effective Date of this Consent Decree. In the event that any such visible emissions are observed, either during the visual assessment described in this Paragraph or otherwise, Defendant shall conduct a six minute observation in accordance with Method 9. If that Method 9 observation indicates that opacity is greater than 5% over the six minute average, then Defendant shall identify and address the source of visible emissions as expeditiously as practicable, and, provided that visibility conditions are sufficient for a Method 9 observation, Defendant shall conduct a six minute observation in accordance with Method 9 at least once every eight hours, until visible emissions are less than 5% over the six minute average. Defendant shall maintain a record of each visual assessment conducted pursuant to this

Paragraph sufficient to meet the requirements in Section XIV (Recordkeeping and Reporting Requirements).

36. Particulate Emissions Best Management Practices Control Plan. Within 60 Days of the Effective Date of this Consent Decree, Defendant shall implement the Particulate Emissions Best Management Practices Control Plan reflected in Appendix C at each of its Facilities, except that the requirements of Paragraph 4 of Appendix C shall not go into effect until 12 Months of the Effective Date of this Consent Decree. For avoidance of doubt, the requirements of Paragraph 6 of Appendix C shall not go into effect until installation of the PM Early Warning System.

37. PM Early Warning System. No later than the dates set forth in the table below, Defendant shall install, and continuing thereafter, Defendant shall Continuously Operate, a PM Early Warning System in accordance with the protocol specified in Appendix D:

Process System	**Date of Continuous Operation**
Orange	Within 365 Days of the Effective Date of this Consent Decree
Ivanhoe	Within 365 Days of the Effective Date of this Consent Decree
Borger	Within 365 Days of the Effective Date of this Consent Decree
Belpre	Within 365 Days of the Effective Date of this Consent Decree

IX. LIMITATION ON USE OF FLARES

38. Limitation On Use Of Flares. No later than the date set forth in the table below, Defendant shall permanently cease operation of the Flares at each of its Facilities, except that at any Facility operating a Co-Generation System, Flares (or at Orange, the Incinerator) may be used in the limited instance of (a) a Malfunction at the Facility that satisfies the requirements of

Section XVII (Affirmative Defenses To Certain Stipulated Penalties), (b) Inspection at the Co-Generation System at the Facility, or (c) Force Majeure that satisfies the requirements of Section XVI (Force Majeure). In response to any of these of instances, Defendant shall operate the Flare only as necessary to comply with the carbon black MACT standard (40 C.F.R. § 63.1103(f)), minimize operation of the Flare to the extent possible, and operate the Flare in accordance with the requirements in Paragraph 39 of this Consent Decree. During operation of the Flare in accordance with this Section IX, the emissions from the Flare (or, at Orange, the Incinerator) shall not be included in the calculation of compliance with any Emission Limits, but shall be included in the calculation of any Caps.

Facility	**Date**
Borger	December 31, 2023 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise December 31, 2022
Belpre	December 31, 2022 if, pursuant to Paragraph 16, Defendant elects to install a WGS, a DGS, or an Alternative Equivalent Pollution Control Technology at Belpre, and not Borger; otherwise December 31, 2023
Ivanhoe	April 1, 2021
Orange	June 30, 2019

39. Limited Operation of Flares. Defendant shall comply with applicable law at all times the Flares are in operation in accordance with Paragraph 38.

X. ADDITIONAL REQUIREMENTS FOR THE ORANGE INCINERATOR

40. Orange Incinerator.

a. No later than December 31, 2017, Defendant shall perform a stack test of the Orange Incinerator, pursuant to the terms in Appendix E. No later than 60 Days after the final test run, Defendant shall submit to the EPA (a) a statement indicating whether the stack test results demonstrate that the Orange Incinerator has met each of the limits in the Maximum Allowable Emission Rate Table for the Orange Incinerator in its existing air permits, numbered 9403B and PSDTX627M2, and if not, which permit limits have not been met, and (b) all stack test results and corresponding recorded operating parameters, including a summary of the results and all supporting data and calculations. If, upon review of the submission, the EPA agrees with the Defendant that the stack test results indicate compliance with each limit in permits 9403B and PSDTX627M2, then Defendant shall, at its choice, operate either the Orange Incinerator in compliance with Paragraphs 26 – 28 and 38 -39 of this Consent Decree, or the Orange Co-Generation System, in compliance with Paragraphs 26 - 28 and 38-39 of this Consent Decree.

b. If the stack test results specified in the Paragraph above do not demonstrate that the Orange Incinerator has met each limit in permits 9403B and PSDTX627M2, or the stack test cannot be performed due to flame height or exit gas temperature, then the Defendant shall, at its choice, Rebuild the Orange Incinerator and/or Refurbish the Orange Co-Generation System and comply with Paragraphs 26 – 28, 30 – 31 and 38 –

39 of this Consent Decree, except that deadlines in those Paragraphs applicable to Orange shall be delayed by 12 Months (e.g., the Date of Continuous Operation to meet the Applicable Emissions Limit shall become 6/30/20). In advance of compliance with Paragraphs 26 – 28, 30 – 31 and 38 – 39 of this Consent Decree, Defendant shall perform a stack test of the Orange Incinerator, pursuant to the terms in Appendix E, and submit to the EPA (a) a statement indicating the stack test results demonstrate that the Orange Incinerator has met each limit in permits 9403B and PSDTX627M2, and (b) all stack test results and corresponding recorded operating parameters, including a summary of the results and all supporting data and calculations.

c. If Defendant and the EPA do not agree on whether the stack test results demonstrate that the Incinerator has met each limit in permits 9403B and PSDTX627M2, or whether the stack test cannot be performed due to flame height or exit gas temperature, then the matter shall be subject to the procedures in Section XVIII (Dispute Resolution) of this Consent Decree.

XI. PROHIBITION ON NETTING CREDITS OR OFFSETS

41. Defendant shall not generate, use or sell any CD Emissions Reductions: as netting reductions; as emissions offsets; to apply for, obtain, trade, or sell any emission reduction credits; or in determining whether a project would result in a significant emissions increase or significant net emissions increase in any PSD, major non-attainment, and/or minor New Source Review permit or permit proceeding.

42. The limitations set forth in Paragraph 41 above do not prohibit Defendant from generating or using Surplus Emission Reductions.

43. Nothing in this Section is intended to prohibit Defendant from generating or using CD Emissions Reductions for compliance with any rules or regulations designed to address regional haze or the non-attainment status of any area (excluding PSD and Non-Attainment New Source Review rules, but including, for example, RACT rules) that apply to the facility. Nothing in this Consent Decree is intended to preclude the CD Emissions Reductions from being considered by a State or EPA for the purpose of attainment demonstrations submitted pursuant to § 110 of the Act, 42 U.S.C. § 7410, or in determining impacts on NAAQS, PSD increment, or air quality related values, including visibility, in a Class I area.

XII. PERMITS

44. Where any compliance obligation under this Consent Decree requires Defendant to obtain a federal, state, or local permit or approval, Defendant shall submit a timely and complete application for each such permit or approval and take all other actions necessary to obtain all such permits or approvals. Defendant may seek relief under the provisions of Section XVI (Force Majeure) for any delay in the performance of any obligation under this Consent Decree resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, only if Defendant has (a) submitted timely and complete applications, and (b) taken all other actions reasonably necessary to obtain such permits or approvals in a timely fashion.

45. In addition to having first obtained any required preconstruction permits or other approvals pursuant to Paragraph 44 above, Defendant, within 12 Months from commencement of

operation of each Control Technology installed, upgraded, and/or operated under this Consent Decree, shall apply to permanently include the requirements and limitations enumerated in this Paragraph into (i) a federally-enforceable permit (other than a Title V operating permit) or request a site-specific amendment to the applicable SIP, such that the requirements and limitations enumerated in this Paragraph become and remain 'applicable requirements' as that term is defined in 40 C.F.R. Part 70.2 and these requirements shall survive the Termination of this Consent Decree in accordance with Section XXVIII (Termination) in the form of a federally-enforceable permit (other than a Title V operating permit) or a site-specific amendment to the applicable SIP, or, (ii) for the consolidated Title V construction and operating permit program in the State of Louisiana, into a consolidated permit, such that the requirements and limitations enumerated in this Paragraph become and remain 'applicable requirements' as that term is defined in 40 C.F.R. Part 70.2 and shall survive the termination of this Consent Decree in accordance with Section XXVIII (Termination). The permit, approval or SIP amendment shall require compliance with the following requirements of this Consent Decree: any applicable (a) 7-day Rolling Average Emissions Limit for SO_2 or NO_x, (b) 365-day Rolling Average Emissions Limit for SO_2 or NO_x, (c) 365-day Rolling Sum Emissions Limit, (d) 30-day Rolling Average Sulfur Content Weight Percent, (e) 365-day Rolling Average Sulfur Content Weight Percent, (f) PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements required by Section VIII, (g) requirements specified in Section IX (Limitation on Use of Flares), (h) Caps, (i) Borger Dryer Permit Restriction, and (j) provisions specified in Paragraphs 19 (SO_2 Monitoring Requirements), 22 (Feedstock Sulfur Content Monitoring Requirements) and 28 (NO_x Monitoring Requirements). Following submission of an

application for any permit or approval, Defendant shall cooperate with the appropriate permitting authority by promptly submitting all information that such permitting authority seeks following its receipt of the application for the permit. For avoidance of doubt, the terms expressly imposed by this Consent Decree regarding the 7-day Rolling Average Emissions Limit for SO_2 or NO_x, 365-day Rolling Average Emissions Limit for SO_2 or NO_x, and 3-hour Average Emissions Limit shall include the requirement to Continuously Operate the specified Control Technology. Defendant agrees not to contest the submittal of any such proposed SIP revision that incorporates the terms of this Consent Decree to EPA, or EPA's approval of such submittal, or the incorporation of the applicable portions of this Consent Decree through these SIP requirements into Title V permits.

46. Upon issuance of a permit, approval or SIP amendment pursuant to the terms of this Section, or in conjunction with the issuance of such permit, approval or SIP amendment, Defendant shall file any applications necessary to incorporate the requirements of the permit into the Title V operating permit for the relevant Facility. Defendant shall not challenge the inclusion in any such permit of the following terms, to the extent expressly imposed by this Consent Decree (a) 7-day Rolling Average Emissions Limit for SO_2 or NO_x, (b) 365-day Rolling Average Emissions Limit for SO_2 or NO_x, (c) 365-day Rolling Sum Emissions Limit, (d) 30-day Rolling Average Sulfur Content Weight Percent, (e) 365-day Rolling Average Sulfur Content Weight Percent, (f) PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements required by Section VIII, (g) requirements specified in Section IX (Limitation on Use of Flares), (h) Caps, (i) Borger Dryer Permit Restriction, and (j) provisions specified in Paragraphs 19 (SO_2 Monitoring Requirements), 22 (Feedstock Sulfur

Content Monitoring Requirements) and 28 (NO_x Monitoring Requirements). For avoidance of doubt, the terms expressly imposed by this Consent Decree regarding the 7-day Rolling Average Emissions Limit for SO_2 or NO_x, 365-day Rolling Average Emissions Limit for SO_2 or NO_x, and 3-hour Average Emissions Limit shall include the requirement to Continuously Operate the specified Control Technology. Notwithstanding the foregoing, nothing in this Consent Decree is intended nor shall it be construed to require the establishment of Emissions Limits or limits on the sulfur content of carbon black feedstock other than those Emissions Limits, 30-day Rolling Average Sulfur Content Weight Percent, and/or 365-day Rolling Average Sulfur Content Weight Percent expressly prescribed in this Consent Decree nor to preclude Defendant from challenging any more stringent Emissions Limits, 30-day Rolling Average Sulfur Content Weight Percent, and/or 365-day Rolling Average Sulfur Content Weight Percent should they be proposed for or included in a Title V operating permit.

47. When permits or SIP amendments are required that concern obligations of Defendant under this Consent Decree, Defendant shall complete and submit applications for such permits or SIP amendments to the appropriate authorities to allow sufficient time for all legally required processing and review of the permit application or application for a SIP amendment, including requests for additional information by the permitting authorities. Any failure by Defendant to submit a timely and complete permit application or application for a SIP amendment shall bar any use by Defendant of Section XVI (Force Majeure), where a Force Majeure claim is based on permitting delays or delays associated with issuance of a SIP amendment.

48. Defendant shall provide EPA with a copy of each application for a permit to address or comply with any provision of this Consent Decree, as well as a copy of any permit proposed as a result of such application, to allow for timely participation in any public comment opportunity.

49. Notwithstanding the reference to Title V permits in this Consent Decree, the enforcement of such permits shall be in accordance with their own terms and the Act and its implementing regulations. Such Title V permits shall not be enforceable under this Consent Decree, although any term or limit established by or under this Consent Decree shall be enforceable under this Consent Decree regardless of whether such term or limit has or will become part of a Title V permit, subject to the terms of Section XXVIII (Termination).

50. Prior to Termination pursuant to the terms of Section XXVIII (Termination), Defendant shall ensure that any enforceable requirements established under the Consent Decree are included in the applicable Title V permit including, but not limited to, any applicable (a) 7-day Rolling Average Emissions Limit for SO_2 or NO_x, (b) 365-day Rolling Average Emissions Limit for SO_2 or NO_x, (c) 365-day Rolling Sum Emissions Limit, (d) 30-day Rolling Average Sulfur Content Weight Percent, (e) 365-day Rolling Average Sulfur Content Weight Percent, (f) PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements required by Section VIII, (g) requirements specified in Section IX (Limitation on Use of Flares), (h) Caps, (i) Borger Dryer Permit Restriction, and (j) monitoring provisions specified in Paragraphs 19 (SO_2 Monitoring Requirements), 22 (Feedstock Sulfur Content Monitoring Requirements) and 28 (NO_x Monitoring Requirements). For avoidance of doubt, the provisions of this Consent Decree in Sections XVI (Force Majeure) and XVII

(Affirmative Defenses to Certain Stipulated Penalties) are applicable to compliance with this Consent Decree only and shall not be incorporated into any permits or approvals obtained in compliance with this Consent Decree.

XIII. REVIEW AND APPROVAL OF SUBMITTALS

51. Defendant shall submit each plan, report, or other submission required by this Consent Decree to the EPA and the applicable Plaintiff-State, whenever such a document is required to be submitted for review or approval pursuant to this Consent Decree. Whenever approval of such document is required pursuant to this Consent Decree, EPA, after consultation with the Plaintiff-State, shall in writing: a) approve the submission; b) approve the submission upon specified conditions; c) approve part of the submission and disapprove the remainder; or d) disapprove the submission, identifying the reasons for such disapproval.

52. If the submission is approved pursuant to Paragraph 51.a, Defendant shall take all actions required by the plan, report, or other document, in accordance with the schedules and requirements of the plan, report, or other document, as approved. If the submission is conditionally approved or approved only in part, pursuant to Paragraph 51.b or .c, Defendant shall, upon written direction from EPA after consultation with the applicable Plaintiff-State, take all actions required by the approved plan, report, or other item that EPA determines are technically severable from any disapproved portions, subject to Defendant's right to dispute only the specified conditions or the disapproved portions, under Section XVIII of this Decree (Dispute Resolution).

53. If the submission is disapproved in whole or in part pursuant to Paragraph 51.c or .d, Defendant shall, within 45 Days or such other time as the Parties agree to in writing, correct

all deficiencies and resubmit the plan, report, or other item, or disapproved portion thereof, for approval, in accordance with the preceding Paragraphs. If the resubmission is approved in whole or in part, Defendant shall proceed in accordance with the preceding Paragraph. Any stipulated penalties applicable to the original submission, as provided in Section XV (Stipulated Penalties) of this Decree, shall accrue during the 45 Day period or other specified period, but shall not be payable unless the resubmission is untimely or is disapproved in whole or in part; provided that, if the original submission was so deficient as to constitute a material breach of Defendant's obligations under this Decree, the stipulated penalties applicable to the original submission shall be due and payable notwithstanding any subsequent resubmission.

54. If a resubmitted plan, report, or other item, or portion thereof, is disapproved in whole or in part, EPA after consultation with the applicable Plaintiff-State may again require Defendant to correct any deficiencies, in accordance with the preceding Paragraphs, or may itself correct any deficiencies, subject to Defendant's right to invoke Dispute Resolution and the right of EPA and Plaintiff-State to seek stipulated penalties as provided in the preceding Paragraphs.

XIV. RECORDKEEPING AND REPORTING REQUIREMENTS

55. Within 30 Days after the end of each half Calendar Year (i.e., by January 30th and July 30th) after the Effective Date, until termination of this Decree pursuant to Section XXVII (Termination), Defendant shall submit a semi-annual report to EPA and, for Ivanhoe only, Plaintiff-State for the immediately preceding half Calendar Year period that shall contain the information described in this Paragraph 55 (a)-(j) for such immediately preceding half Calendar Year period.

a. A description of the progress of the construction of the Control Technologies, CEMS, and PM Early Warning Systems required by this Consent Decree, including:

i. if construction is not underway, any available information concerning the construction schedule and the execution of major contracts;

ii. if construction is underway, the estimated percent of installation as of the end of the reporting period, the current estimated construction completion date, and a brief description of completion of significant milestones during the reporting period;

iii. any information indicating that installation and commencement of operation may be delayed, including the nature and cause of the delay, and any steps taken by Defendant to mitigate such delay;

iv. once construction is complete, the dates the equipment was placed in service and/or commenced Continuous Operation and the dates of any testing that was performed during the period;

b. All information necessary to demonstrate compliance with all applicable Emissions Limits, Caps, all aspects of Paragraph 30 (Additional Operational Restrictions at Borger), 365-day Rolling Average Sulfur Content Weight Percent, and other provisions in Sections VI (SO_2 Control Technology, Emissions Limits, and Monitoring Requirements), VII (NO_x Control Technology, Emissions Limits, and Monitoring Requirements),

VIII (PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements), Section IX (Limitation on Use of Flares), and Section X (Additional Requirements for the Orange Incinerator);

c. All data collected for each Orange Process System, from the time any 30-day Rolling Average Sulfur Content Weight Percent and/or 365-day Rolling Average Sulfur Content Weight Percent is exceeded until compliance is achieved, and an explanation of any periods of downtime of any relevant equipment that prohibited the collection of such data;

d. All CEMS data collected for each Process System, from the time any Emissions Limit in Sections VI (SO_2 Control Technology, Emissions Limits, and Monitoring Requirements) and VII (NO_x Control Technology, Emissions Limits, and Monitoring Requirements) or Caps is exceeded until compliance is achieved, and an explanation of any periods of downtime of such CEMS;

e. A copy of the protocol for any PM stack tests performed in accordance with the requirements of Paragraph 34.

f. All PM Early Warning System data collected, from the time a PM Early Warning System alarm is triggered until the PM Early Warning System data have returned to below the action levels triggering an alarm condition, and an explanation of any periods of PM Early Warning System downtime;

g. A description of any potential violation of the requirements of this Consent Decree, including any exceedance resulting from Malfunctions, any exceedance of an Emissions Limit, any exceedance of a Caps, any exceedance of a 30-day Rolling Average Sulfur Content Weight Percent or 365-day Rolling Average Sulfur Content Weight Percent, or any failure to install, commence operation or Continuously Operate any Control Technology or any PM Early Warning System, which includes:

i. the date and duration of, and the quantity of any emissions related to, the potential violation;

ii. a full explanation of the primary cause and any other significant contributing cause(s) of the potential violation;

iii. an analysis of all reasonable interim and long-term remedial steps or corrective actions, including all design, operation, and maintenance changes consistent with good engineering practices, if any, that could be taken to reduce or eliminate the probability of recurrence of such potential violation, and, if not already completed, a schedule for its (their) implementation, or, if Defendant concludes that remedial steps or corrective actions should not be conducted, the basis for that conclusion;

h. If no violations occurred during a reporting period, a statement that no violations occurred;

i. A description of the status of any permit applications and any proposed

SIP revisions required under this Consent Decree; and

j. A summary of all actions undertaken and Project Dollars expended during the reporting period, as well as any cumulative Project Dollars expended, and the estimated environmental benefits achieved to date in satisfaction of the requirements of Section V (Environmental Mitigation) and Appendix A.

56. If Defendant violates, or has reason to believe that it may have violated, any requirement of this Consent Decree, including any exceedance resulting from Malfunctions, any exceedance of an Emissions Limit, any exceedance of a Cap, any exceedance of a 30-day Rolling Average Sulfur Content Weight Percent or 365-day Rolling Average Sulfur Content Weight Percent, any failure to install, commence operation or Continuously Operate any Control Technology or any PM Early Warning System, Defendant shall notify EPA and Plaintiff-State of such event, and its likely duration, in writing, within 30 Business Days of the Day Defendant first becomes aware that it has violated or may violate the Consent Decree, with an explanation of the likely cause of the event, remedial steps or corrective action taken, or to be taken, including all design, operation, and maintenance changes consistent with good engineering practices, if any, to reduce or eliminate the probability of recurrence of such violation. Nothing in this Paragraph or the following Paragraph relieves Defendant of its obligation to provide the notice required by Section XVI (Force Majeure) if Defendant contends a Force Majeure event occurred.

57. Whenever any violation of this Consent Decree, or of any applicable permits required under this Consent Decree, or any other event affecting Defendant's performance under

this Decree may pose an immediate threat to the public health or welfare or the environment, Defendant shall notify EPA and Plaintiff-State, orally or by electronic or facsimile transmission as soon as possible, but no later than seven Days after Defendant first knew, or should have known, of the violation or event. This procedure is in addition to the requirements set forth in the preceding Paragraph.

58. Within 60 Days following the completion of each Environmental Mitigation Project required under this Consent Decree, Defendant shall submit to the EPA and Plaintiff-State a report that documents the date that the Environmental Mitigation Project was completed, the results from implementing the Environmental Mitigation Project, including the emission reductions or other environmental benefits achieved, and the Project Dollars expended by Defendant in implementing the Environmental Mitigation Project.

59. All reports shall be submitted as set forth in Section XXII (Notices). All data shall be reported using the number of significant digits in which the pertinent standard or limit is expressed.

60. Each report submitted by Defendant under this Section shall be signed by an official of the submitting party and include the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This certification requirement does not apply to emergency or similar notifications where compliance would be impractical.

61. The reporting requirements of this Consent Decree do not relieve Defendant of any reporting obligations required by the Clean Air Act or implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement.

62. Any information provided pursuant to this Consent Decree may be used by the Plaintiffs in any proceeding to enforce the provisions of this Consent Decree and as otherwise permitted by law.

63. Defendant may also assert that information required to be provided under this Section is protected as "Confidential Business Information" ("CBI") under 40 C.F.R. Part 2 or any applicable state laws. If the Defendant elects to do so, it shall designate any such information as CBI subject to 40 C.F.R. Part 2 or the applicable state law, and follow the requirements of 40 C.F.R. Part 2 or the applicable state law for the protection of such information, including by segregating the CBI material from the rest of the report, and substantiating each element of each CBI claim in the report. Any information to be provided to LDEQ that Defendant wishes to protect as CBI shall follow the law and procedures set forth in the applicable provisions of La. R.S. 30:2030, La. R.S. 30:2074.D, and LA ADMIN. CODE tit. 33, Pt. I, Chapter 5. No monitoring data or other data evidencing the amount or content of emissions from any Facility shall be considered as CBI or subject to any privilege, provided, however, that nothing within this provision prohibits Defendant from invoking Paragraph 96 and the confidential business determination process specified therein, including over feedstock information. Plaintiffs reserve all rights to dispute such a claim.

XV. STIPULATED PENALTIES

64. Defendant shall be liable for stipulated penalties to the United States for violations of this Consent Decree, and to the United States and LDEQ for violations of this Consent Decree with respect to Ivanhoe, as specified in the table below, unless excused under Section XVI (Force Majeure) or Defendant establishes a defense under Section XVII (Affirmative Defense to Certain Stipulated Penalties). Violation of any Emissions Limit, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent is a violation on every Day on which the average or sum is based and each subsequent Day of violation of such Emissions Limit, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent is subject to the corresponding penalty per Day as specified in the table below, provided that, when a violation of an Emissions Limit (for the same pollutant and from the same source), 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent recurs within periods of less than seven Days, Defendant shall not pay a second or multiple daily stipulated penalty for any Day of recurrence for which a stipulated penalty is already payable. Stipulated penalties may only be assessed once for a given Day within any averaging or summation period for violation of any particular Emissions Limit, Cap, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent.

Consent Decree Violation	Stipulated Penalty
a. Failure to pay the civil penalty as specified in Section IV (Civil Penalty)	$5,000 per Day

Consent Decree Violation	Stipulated Penalty
b. Failure to comply with any applicable Emissions Limit, Cap, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent, where the violation is less than 5% in excess of the limits set forth in this Consent Decree	$1,000 per Day per violation
c. Failure to comply with any applicable Emissions Limit, Cap, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent, where the violation is equal to or greater than 5% but less than 10% in excess of the limits set forth in this Consent Decree	$2,000 per Day per violation
d. Failure to comply with any applicable Emissions Limit, Cap, 30-day Rolling Average Sulfur Content Weight Percent, or 365-day Rolling Average Sulfur Content Weight Percent, where the violation is greater than 10% in excess of the limits set forth in this Consent Decree	$3,000 per Day per violation
e. Failure to install, commence operation, or Continuously Operate a Control Technology required under this Consent Decree	$5,000 per Day per violation during the first 30 Days, $10,000 per Day per violation for the next 30 Days, and $37,500 per Day per violation thereafter
f. Failure to install, commence operation, or Continuously Operate a PM Early Warning System as required under this Consent Decree	$1,000 per Day per violation
g. Failure to install or operate a CEMS as required in this Consent Decree	$1,000 per Day per violation
h. Failure to perform a stack test as required in Paragraph 34 and Appendix E of this Consent Decree (if stack test not prevented by flame height or exit gas temperature)	$1,000 per Day per violation
i. Failure to apply for any permit required by Section XII (Permits) and failure to comply with any aspect of Paragraph 30 (Additional Operational Restrictions at Borger)	$1,000 per Day per violation

Consent Decree Violation	Stipulated Penalty
j. Failure to comply with all terms and conditions, including drafting submittals, operational requirements, and complying with protocols set forth in Appendix E or not otherwise covered by other stipulated penalties.	$750 per Day per violation during the first ten Days, $1,000 per Day per violation thereafter
k. Failure to timely submit, modify, or implement, as approved, the reports, plans, studies, analyses, protocols, or other submittals required in this Consent Decree	$750 per Day per violation during the first ten Days, $1,000 per Day per violation thereafter
l. Failure to timely submit, modify, or implement, as approved, a report, plan, study, analysis, protocol, or other submittal required with respect to Environmental Mitigation Projects prescribed in Section V (Environmental Mitigation) or Appendix A	$750 per Day per violation during the first ten Days, $1,000 per Day per violation thereafter
m. Any other violation of this Consent Decree	$1,000 per Day per violation

65. Subject to the provisions of Paragraph 64 above, stipulated penalties under this Section shall begin to accrue on the Day after performance is due or on the Day a violation occurs, whichever is applicable, and shall continue to accrue until performance is satisfactorily completed or until the violation ceases. Nothing in this Consent Decree shall prevent the simultaneous accrual of separate stipulated penalties for separate violations of this Consent Decree. The United States or LDEQ, or both of the foregoing, may seek stipulated penalties under this Section with respect to violations involving Ivanhoe. The United States alone may seek stipulated penalties with respect to violations involving Belpre, Borger, or Orange. Where both the United States and a Plaintiff-State seek stipulated penalties for the same violation of this Consent Decree, Defendant shall pay 50% to the United States and 50% to the Plaintiff-State. The Plaintiff making a demand for payment of a stipulated penalty shall simultaneously send a copy of the demand to the other Plaintiffs.

66. Defendant shall pay any stipulated penalty within 30 Days of receiving the United States' and/or a Plaintiff-State's written demand, unless Defendant elects within 20 Days of receipt of written demand to dispute the imposition or accrual of stipulated penalties in accordance with the provisions in Section XVIII (Dispute Resolution) of this Consent Decree.

67. EPA and Plaintiff-State may, in the unreviewable exercise of their collective or individual discretion, reduce or waive their portion of stipulated penalties otherwise due to either the United States or Plaintiff-State under this Consent Decree.

68. Stipulated penalties shall continue to accrue as provided in this Section during any dispute, with interest on accrued stipulated penalties payable and calculated at the rate established by the Secretary of the Treasury, pursuant to 28 U.S.C. § 1961, but need not be paid until the following:

a. If the dispute is resolved by agreement between the Parties or by a decision of the United States and/or Plaintiff-State that is not appealed to the Court, Defendant shall pay accrued penalties determined to be owing, together with interest accruing from the 31st Day after the written demand in Paragraph 66, within 30 Days of the effective date of the agreement or the receipt of EPA's and/or Plaintiff-State's decision or order.

b. If the dispute is appealed to the Court and the United States and/or Plaintiff-State is the prevailing party, in whole or in part, as may be determined by the Court, Defendant shall pay all accrued penalties determined by the Court to be owing, together with interest accruing from the 31st Day after the written demand in Paragraph 66, within 60 Days of

receiving the Court's decision or order, except as provided in subparagraph c, below.

c. If any Party appeals the District Court's decision, Defendant shall pay all accrued penalties determined to be owing, together with interest accruing from the 31st Day after the written demand in Paragraph 66, within 15 Days of receiving the final appellate court decision.

69. Defendant shall pay stipulated penalties owing to the United States and/or Plaintiff-State in the manner set forth and with the confirmation notices to the persons specified in Section IV (Civil Penalty), except that the transmittal letter shall state that the payment is for stipulated penalties and shall state for which violation(s) the penalties are being paid.

70. If Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, Defendant shall be liable for interest on such penalties, as provided for in 28 U.S.C. § 1961, accruing as of the date payment became due. Nothing in this Paragraph shall be construed to limit the United States and/or Plaintiff-State from securing any remedy otherwise provided by law for Defendant's failure to pay any stipulated penalties.

71. The stipulated penalties provided for in this Consent Decree shall be in addition to any other rights, remedies, or sanctions available to the United States and/or Plaintiff-State for Defendant's violation of this Consent Decree or applicable law, except that for any violation of this Consent Decree that is also a violation of any applicable statute or regulation, Defendant shall be allowed a credit, dollar for dollar, for any stipulated penalties paid, against any statutory penalties imposed for such violation, including penalties resulting from enforcement pursuant to Paragraphs 64 and 70.

XVI. FORCE MAJEURE

72. "Force Majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Defendant, or its vendors or Contractors, or entity controlled by Defendant that causes a delay or impediment to performance in complying with any obligation under this Consent Decree despite Defendant's best efforts to fulfill the obligation. This may include, but not be limited to, delays caused by labor strikes, transport delays, and civil unrest, depending on the circumstances of the particular claim. The requirement that Defendant exercises best efforts to fulfill the obligation includes using best efforts to anticipate any potential Force Majeure event and best efforts to address the effects of any such event (a) as it is occurring and (b) after it has occurred to prevent or minimize any resulting delay and/or violation and/or emissions during such event to the greatest extent possible. Force Majeure does not include Defendant's financial inability to perform any obligation under this Consent Decree. Unanticipated or increased costs or expenses associated with the performance of Defendant's obligations under this Consent Decree shall not constitute circumstances beyond Defendant's control, nor serve as the basis for an extension of time under this Section, and shall not constitute an event of Force Majeure.

73. If any event occurs or has occurred that may delay or prevent compliance with the performance of any obligation under this Consent Decree, as to which Defendant intends to assert a claim as an event of Force Majeure, Defendant shall provide notice orally or by electronic or facsimile transmission to the representatives of EPA and Plaintiff-State designated to receive notice pursuant to Section XXII (Notices) as soon as practicable but no later than seven Business Days following the date Defendant first knew that the claimed Force Majeure

event may cause such delay or impediment and give rise to a claim of Force Majeure. Defendant shall provide written notice of the event as soon as practicable, but in no event later than 21 Business Days following the date when Defendant first knew that the event might cause such delay or impediment. The written notice shall reference this Paragraph of the Consent Decree and explain and describe the reasons for the delay or impediment, the anticipated duration of the delay or impediment, all actions taken or to be taken to prevent or minimize the delay or impediment, a schedule for implementation of any measures to be taken to prevent or mitigate the delay or impediment or the effect of the delay or impediment, and Defendant's rationale for attributing such delay or impediment to a Force Majeure event if it intends to assert such a claim. Defendant shall include with any written notice all available documentation supporting the claim that the delay or impediment was attributable to a Force Majeure event. Defendant shall be deemed to know of any circumstance of which Defendant's Contractors, or any entity controlled by it, knew or should have known.

74. Failure by Defendant to comply with the notice requirements of Paragraph 73 renders this Section voidable by EPA, as to the specific event for which Defendant has failed to comply with such notice requirement. If so voided, it shall be of no effect as to the particular event involved. If EPA, after consultation with Plaintiff-State, agrees that the delay or impediment or anticipated delay or impediment is attributable to a Force Majeure event, the Parties may reach agreement and stipulate in writing to an extension of the required deadline(s) for all requirement(s) affected by the Force Majeure event for a period equivalent to the delay actually caused by the Force Majeure event, or such other period as may be appropriate in light of the circumstances. If such stipulation results in a material change to the terms of the Consent

Decree, the stipulation shall be filed as a modification to the Consent Decree pursuant to Section XXV (Modification). An extension of the time for performance of the obligations affected by the Force Majeure event shall not, of itself, extend the time for performance of any other obligation. If the Parties do not reach agreement on the appropriate extension of any deadlines affected by a Force Majeure event, EPA will notify Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the Force Majeure event. Defendant shall comply with the extended deadlines specified in the notice from EPA, subject to the provisions of Section XVIII (Dispute Resolution).

75. If EPA, after consultation with Plaintiff-State, does not agree that the delay or impediment or anticipated delay or impediment has been or will be caused by a Force Majeure event, EPA will notify Defendant in writing of its decision.

76. If Defendant elects to invoke the formal dispute resolution procedures set forth in Section XVIII (Dispute Resolution), it shall do so no later than 45 Days after receipt of EPA's notice pursuant to Paragraph 74 or Paragraph 75, whichever applies, and shall first comply with the provisions for informal dispute resolution contained in Section XVIII before proceeding to formal dispute resolution. In any such proceeding in accordance with formal dispute resolution procedures, Defendant shall have the burden of demonstrating that the delay or impediment or anticipated delay or impediment has been or will be caused by a Force Majeure event, that the duration of the delay or impediment or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay or impediment, and that Defendant complied with the requirements of Paragraphs 72-73, above. If Defendant carries this burden, the delay or impediment at issue shall be deemed not to be a

violation by Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

77. This Court shall not draw any inferences nor establish any presumptions adverse to any Party as a result of Defendant delivering a notice of Force Majeure or the Parties' inability to reach agreement.

XVII. AFFIRMATIVE DEFENSES TO CERTAIN STIPULATED PENALTIES

78. If any of Defendant's Process Systems exceeds a 3-hour Average Emissions Limit, or a 7-day Rolling Average Emissions Limit due to a Malfunction, Defendant, bearing the burden of proof by a preponderance of the evidence, has an affirmative defense to a claim for stipulated penalties under this Consent Decree, if Defendant complies with the notice and reporting requirements of Paragraph 79 of this Section, and demonstrates all of the following:

a. The excess emissions were caused by a sudden, unavoidable breakdown of technology beyond Defendant's control (which may be from, for example, a power failure resulting from a weather disturbance, or the failure from a supplier of utilities, depending on the circumstances of the specific claim);

b. The excess emissions did not stem from any activity or event that was foreseeable and avoidable, nor could have been avoided by operation and maintenance practices in accordance with manufacturers' specifications and good engineering and maintenance practices;

c. The air pollution control equipment and processes were maintained and operated in a manner consistent with good practice for minimizing emissions;

d. Repairs were made as expeditiously as practical when Defendant knew or should have known that the applicable 3-hour Average Emissions Limit, or a 7-day Rolling Average Emissions Limit was being or would be exceeded;

e. Defendant took all practical measures to limit the amount and duration of the excess emissions (including any bypass) in a manner consistent with good practice for minimizing emissions;

f. Relevant emission monitoring systems were kept in operation to the extent practical;

g. Defendant's actions in response to the excess emissions were documented by contemporaneous operating logs, or other relevant evidence;

h. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

i. Defendant properly and promptly notified Plaintiffs as required by this Consent Decree.

79. To assert an affirmative defense for Malfunction under Paragraph 78, Defendant shall provide notice to the Plaintiffs in writing of Defendant's intent to assert an affirmative defense in Defendant's semi-annual progress reports required by Paragraph 55. The notice shall contain:

a. The identity of each emission point where the excess emissions occurred;

b. The magnitude of the excess emissions expressed in the units of the applicable Emissions Limits and the operating data and calculations used

in determining the magnitude of the excess emissions;

c. The time and duration or expected duration of the excess emissions;

d. The identity of the equipment from which the excess emissions emanated;

e. The nature and cause of the emissions;

f. The steps taken to remedy the Malfunction and the steps taken or planned to prevent the recurrence of the Malfunctions;

g. The steps that were or are being taken to limit the excess emissions; and

h. If Defendant's permit contains procedures governing source operation during periods of Malfunction and the excess emissions resulted from Malfunction, a list of the steps taken to comply with the permit procedures.

80. The affirmative defense provided herein is only an affirmative defense to stipulated penalties for violations of this Consent Decree, and not a defense to any civil or administrative action for injunctive relief. A Malfunction shall not constitute a Force Majeure event unless the Malfunction also meets the definition of a Force Majeure event, as provided in Section XVI (Force Majeure).

XVIII. DISPUTE RESOLUTION

81. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree, including, but not limited to, Section XV (Stipulated Penalties) and Section XVI (Force Majeure). Defendant's failure to seek resolution

of a dispute under this Section shall preclude Defendant from raising any such issue as a defense to an action to enforce any obligation of Defendant arising under this Decree.

82. Any dispute subject to Dispute Resolution under this Consent Decree shall first be the subject of informal negotiations between the Parties. The dispute shall be considered to have arisen when Defendant sends the United States and the applicable Plaintiff-State a written notice of Dispute. Such notice of dispute shall clearly describe the nature of the dispute and shall state Defendant's position with regard to such dispute. The period of informal negotiations shall not exceed 20 Days from the date of sending the notice of dispute, unless that period is modified by written agreement. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States, after consultation with the applicable Plaintiff-State, shall be considered binding unless, within 20 Days after the conclusion of the informal negotiation period, Defendant invokes formal dispute resolution procedures as set forth below.

83. Defendant may invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by serving on the United States and the applicable Plaintiff-State, in accordance with Section XXII (Notices), a written statement of position regarding the matter in dispute. The statement of position shall include, but may not necessarily be limited to, any factual data, analysis, or opinion supporting Defendant's position and any supporting documentation relied upon by Defendant.

84. The United States, after consultation with the applicable Plaintiff-State, shall serve its statement of position within 45 Days of receipt of Defendant's statement of position. The United States' statement of position shall include, but may not necessarily be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation

relied upon by the United States. The statement of position of the United States shall be binding on Defendant, unless Defendant files a motion for judicial review of the dispute in accordance with the following Paragraph.

85. Defendant may seek judicial review of the dispute by filing with the Court, and serving on the United States and the applicable Plaintiff-State, in accordance with Section XXII (Notices), a motion requesting judicial resolution of the dispute. The motion shall contain a written statement of Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree. The United States, after consultation with the applicable Plaintiff-State, shall respond to Defendant's motion within the time period allowed by the rules of this Court.

86. Except as otherwise provided in this Consent Decree, the Court shall decide all disputes pursuant to applicable principles of law. The disputing Parties shall state their respective positions as to the applicable standard of law for resolving the particular dispute in the Parties' initial filings with the Court under Paragraphs 84 and 85. Except as otherwise provided in this Consent Decree, in any dispute brought under this Section XVIII (Dispute Resolution), Defendant shall bear the burden of demonstrating that its position complies with this Consent Decree.

87. The time periods set out in this Section may be shortened or lengthened upon motion to the Court by one of the Parties to the dispute, explaining the Party's basis for seeking such a scheduling modification.

88. The invocation of dispute resolution procedures under this Section shall not, by itself, extend, postpone, or affect in any way any obligation of Defendant under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with respect to the disputed matter shall continue to accrue from the first Day of noncompliance, subject to the cap in Paragraph 68, but payment shall be stayed pending resolution of the dispute and in accordance with any extension or modification of the schedule for completion of work as provided in Paragraph 74. If Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XV (Stipulated Penalties).

89. As part of the resolution of any dispute under this Section, in appropriate circumstances the disputing Parties may agree, in writing, or this Court may order, an extension or modification of the schedule for the completion of the work required under this Consent Decree. Defendant shall be liable for stipulated penalties pursuant to Section XV (Stipulated Penalties) for its failure thereafter to complete the work in accordance with the extended or modified schedule, provided that Defendant shall not be precluded from asserting that an event of Force Majeure has caused or may cause a delay in complying with the extended or modified schedule.

90. Issuance, renewal, modification, denial or revocation of a permit and issuance of orders or other actions by state agencies are not subject to dispute resolution under this Consent Decree.

XIX. INFORMATION COLLECTION AND RETENTION

91. The United States, and its representatives, including attorneys, contractors, and consultants, shall have the right of entry into any Facility covered by this Consent Decree, and

LDEQ (as to Ivanhoe only) and their representatives, including attorneys, contractors, and consultants, shall have the right of entry into any Facility covered by this Consent Decree, at all reasonable times, upon presentation of credentials, to:

a. monitor the progress of activities required under this Consent Decree;

b. verify any data or information submitted to the United States or Plaintiff-State in accordance with the terms of this Consent Decree;

c. obtain samples and, upon request, splits of any samples taken by Defendant or its representatives, Contractors, or consultants;

d. obtain copies of any documents, including photographs and similar data, relating to activities required under this Consent Decree; and

e. assess Defendant's compliance with this Consent Decree.

92. Until five years from termination for the particular Facility, Defendant shall retain in electronic form, and shall instruct its Contractors and agents to preserve in electronic form, all non-identical copies of all documents and records in their possession or control, or that come into their possession or control, and that relate to Defendant's performance of its obligations under this Consent Decree. This information-retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United State or the applicable Plaintiff-State, Defendant shall provide copies of any documents, records, or other information required to be maintained under this Paragraph.

93. At the conclusion of the information-retention period provided in Paragraph 92 above, Defendant shall notify the United States and the applicable Plaintiff-State at least 90 Days

prior to the destruction of any documents, records, or other information subject to the requirements of Paragraph 92 and, upon request by the United States or the applicable Plaintiff-State, Defendant shall deliver any such documents, records, or other information to EPA or the applicable Plaintiff-State.

94. Defendant may assert that certain documents, records, or other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Defendant asserts such a privilege, it shall provide the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of each author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the basis of the privilege asserted by Defendant. However, no documents, records, or other information created or generated pursuant to the requirements of this Consent Decree shall be withheld on grounds of privilege.

95. All information and documents submitted by Defendant pursuant to this Consent Decree shall be subject to any requests under applicable law providing public disclosure of documents unless (a) the information and documents are subject to legal privileges or protection or (b) Defendant claims and substantiates in accordance with 40 C.F.R. Part 2 and any applicable State law that the information and documents contain confidential business information.

96. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States or the applicable Plaintiff-State pursuant to applicable federal or state laws, regulations, or permits, nor does it limit or affect any

duty or obligation of Defendant to maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XX. EFFECT OF SETTLEMENT / RESERVATION OF RIGHTS

97. Entry of this Consent Decree shall resolve all civil claims of the Plaintiffs against Defendant arising under Parts C or D of Subchapter I of the Clean Air Act, 42 U.S.C. §§ 7470 to 7492, 7501-7515, the regulations promulgated thereunder at 40 C.F.R. §§ 51.21, 51.165 and 51.166, 40 CFR Part 51, Appendix S and 40 CFR 52.24, the portions of applicable SIPs and related rules adopted pursuant to 40 C.F.R. §§ 51.165 and 51.166, and under Subchapter V of the Clean Air Act, §§ 7661 to 7661f and federal and state regulations promulgated thereunder, with respect to SO_2, NO_x, VOC, CO, and PM, (including PM10), and any permit condition that incorporates one or more of the foregoing regulatory provisions, that arose from construction or modification of the Process Systems covered by this Consent Decree that commenced prior to the Date of Lodging of this Consent Decree. Entry of this Consent Decree shall also resolve the civil claims of the Plaintiffs for the allegations of noncompliance set forth in the Complaint and in the Notices of Violation issued by EPA.

98. Notwithstanding the resolution of liability in Paragraph 97, nothing in this Consent Decree precludes the United States and/or Plaintiff-State from seeking from Defendant injunctive relief, penalties, or other appropriate relief for violations by Defendant of the regulatory requirements identified in Paragraph 97 resulting from (1) construction or modification that commenced prior to the Date of Lodging of the Consent Decree, if the resulting violations do not relate to the Facilities covered by this Consent Decree or do not relate to NO_x, SO_2, CO, VOCs, or PM or (2) any construction or modification that commences after the Date of

Lodging of the Consent Decree. Nothing in this Consent Decree limits or restricts any defenses otherwise available to Defendant in responding to any enforcement action addressed by this Paragraph.

99. The Plaintiffs reserve all legal and equitable remedies available to enforce the provisions of this Consent Decree. This Consent Decree shall not be construed to limit the rights of the United States or Plaintiff-State to obtain penalties or injunctive relief under the Act or implementing regulations, or under other federal or state laws, regulations, or permit conditions, except as expressly specified in Paragraph 97. The Plaintiffs further reserve all legal and equitable remedies to address any imminent and substantial endangerment to the public health or welfare or the environment arising at, or posed by, one or more of Defendant's Facilities, whether related to the violations addressed in this Consent Decree or otherwise.

100. In any subsequent administrative or judicial proceeding initiated by the United States or Plaintiff-State for injunctive relief, civil penalties, or other appropriate relief relating to the Facilities or to Defendant's violations, Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or Plaintiff-State in the subsequent proceeding were or should have been brought in the instant case, except with respect to claims that have been specifically resolved pursuant to Paragraph 97 of this Section.

101. This Consent Decree is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. Defendant is responsible for achieving and maintaining compliance with all applicable federal, state, and local laws, regulations, and

permits; and Defendant's compliance with this Consent Decree shall be no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The Plaintiffs do not, by their consent to the entry of this Consent Decree, warrant or aver in any manner that Defendant's compliance with any aspect of this Consent Decree will result in compliance with provisions of the Act, 42 U.S.C. § 7401 et seq., or with any other provisions of federal, state, or local laws, regulations, or permits.

102. This Consent Decree does not limit or affect the rights of Defendant or of the United States or Plaintiff-State against any third parties not party to this Consent Decree, nor does it limit the rights of third parties not party to this Consent Decree, against Defendant, except as otherwise provided by law.

103. This Consent Decree shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

XXI. COSTS

104. The Parties shall bear their own costs of this action, including attorneys' fees, except that the Plaintiffs shall be entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by Defendant.

XXII. NOTICES

105. Unless otherwise provided herein, whenever notifications, submissions, or communications are required by the Consent Decree, they shall be made in writing and addressed as follows:

To EPA:

Director, Air Enforcement Division
U.S. Environmental Protection Agency
MC 2242A
1200 Pennsylvania Ave. NW
Washington, D.C. 20460

And

Cheryl Seager
Director
Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

And

Attn: Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency
Region 5
77 West Jackson Blvd.
Chicago, IL 60604-3590

Email: r5airenforcement@epa.gov

To the United States (in addition to the EPA addresses above):

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, D.C. 20044-7611
Re: DOJ No. 90-5-2-1-10189

For all submissions referring to Ivanhoe, to LDEQ:

Brandon B. Williams, LA BAR Roll# 27139
Attorney
Office of the Secretary, Legal Division
Louisiana Department of Environmental Quality
P.O. Box 4302

Baton Rouge, Louisiana 70821-4302

And

Celena Cage
Enforcement Administrator
Office of Environmental Compliance
Louisiana Department Environmental Quality
P.O. Box 4312
Baton Rouge, Louisiana 70821-4312

To Defendant:

Mark E. Peters
Senior Vice President and General Manager, Americas Region
Orion Engineered Carbons LLC
4501 Magnolia Cove Drive
Suite 106
Kingwood, TX 77345

Jimmy Boyd
Director, Environmental & Governmental Affairs, Americas Region
8003 Clearmeadow Drive
Amarillo, TX 79119
David M. Friedland
Beveridge & Diamond, PC
1350 I Street NW Suite 700
Washington, D.C. 20005

106. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address or means of transmittal provided above.

107. All notifications, communications, or submissions made pursuant to this Section shall be sent as follows: (a) by overnight mail or overnight delivery service to the EPA, and by overnight mail to the United States (in addition to the EPA, as set forth in paragraph 105), with a copy by electronic mail if practicable; (b) by electronic mail to Plaintiff-State, if practicable, but if not practicable, then by overnight mail or overnight delivery service to Plaintiff-State; and (c)

if to Defendant, by overnight mail or overnight delivery service, with a copy by electronic mail if practicable.

108. Notices submitted pursuant to this Section shall be deemed submitted upon delivery to the delivery service, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XXIII. EFFECTIVE DATE

109. The Effective Date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first, as recorded on the Court's Docket.

XXIV. RETENTION OF JURISDICTION

110. The Court shall retain jurisdiction over this case until termination of this Consent Decree, for the purpose of resolving disputes arising under this Decree or entering orders modifying this Decree, pursuant to Sections XVIII (Dispute Resolution) and XXV (Modification), or effectuating or enforcing compliance with the terms of this Decree.

XXV. MODIFICATION

111. Except as provided in Section XXVI (Sales or Transfer of Operational or Ownership Interests), the terms of this Consent Decree, including the Appendices, may be modified only by a subsequent written agreement signed by the Plaintiffs and Defendant. Where the modification constitutes a material change to any term of this Consent Decree, it shall be effective only upon approval by the Court.

112. Any disputes concerning modification of this Decree or the issue of the materiality of any modification of this Decree shall be resolved pursuant to Section XVIII

(Dispute Resolution) of this Decree, provided however, that, instead of the burden of proof provided by Paragraph 86, the Party seeking the modification bears the burden of demonstrating that it is entitled to the requested modification in accordance with Federal Rule of Civil Procedure 60(b).

XXVI. SALES OR TRANSFER OF OPERATIONAL OR OWNERSHIP INTERESTS IN A FACILITY

113. Prior to any transfer of ownership or operation of any Facility or Facilities becoming effective, Defendant shall provide a copy of this Consent Decree to the proposed transferee and shall simultaneously provide written notice of the prospective transfer, to EPA, the United States, and Plaintiff-State in accordance with Section XXII (Notices) of this Consent Decree, and subject to the provisions of Paragraph 95 of this Consent Decree. Defendant shall condition any transfer, in whole or in part, of ownership or operation, or other interest in any Facility or Facilities upon the execution by the proposed transferee of a modification of the Consent Decree, making the terms and conditions of the Consent Decree that apply to such Facility applicable to the transferee. By no earlier than 30 days after providing the notice required by this Paragraph, Defendant may file a motion to modify the Consent Decree to make the terms and conditions of the Consent Decree applicable to the transferee. If the Court approves the modification, Defendant shall be released from the obligations and liabilities of the Consent Decree on the date the Court approves the modification. Any attempt to transfer ownership or operation of any of the Facilities or any portion thereof, without complying with this Paragraph constitutes a violation of this Consent Decree.

114. Notwithstanding the foregoing, however, Defendant may not transfer, and may not be released from, any obligation under this Consent Decree that is not specific to the transferred interests, and may not be released from the requirements in Section IV (Civil Penalty). This Section XXVI shall not be construed to affect or apply to mergers or acquisitions in which the shares of Defendant or any parent corporations are acquired by any third party and the surviving corporation, by operation of law, assumes all of the assets and liabilities of Defendant, including the obligations of Defendant under this Consent Decree. For clarification, any sale or transfer of a direct or indirect shareholding in the Defendant is not subject to this Section XXVI.

XXVII. PUBLIC PARTICIPATION

115. The Parties agree and acknowledge that final approval by the United States and entry of this Consent Decree is subject to the procedures of 28 C.F.R. § 50.7, which provides for notice of the lodging of this Consent Decree in the Federal Register, an opportunity for public comment, and the right of the United States to withdraw or withhold consent if the comments disclose facts or considerations which indicate that the Consent Decree is inappropriate, improper, or inadequate. The Defendant shall not oppose entry of this Consent Decree by this Court or challenge any provision of this Consent Decree unless the United States has notified the Defendant, in writing, that the United States no longer supports entry of the Consent Decree. Further, the parties agree and acknowledge that final approval by LDEQ, and entry of this Consent Decree is subject to the requirements of La. R.S. 30:2050.7, which provides for public notice of this Consent Decree in newspapers of general circulation and the official journals of parishes in which the Defendant's Facilities are located, an opportunity for public comment,

consideration of any comments, and concurrence by the State Attorney General. LDEQ reserves the right to withdraw or withhold consent if the comments regarding this Consent Decree disclose facts or considerations which indicate that this Consent Decree is inappropriate, improper or inadequate.

XXVIII. TERMINATION

116. Termination as to an Individual Facility. After Defendant has paid the Section IV civil penalty and any stipulated penalties due under this Consent Decree, and satisfied the requirements of Sections VI (SO_2 Control Technology, Emissions Limits, and Monitoring Requirements), VII (NO_x Control Technology, Emissions Limits, and Monitoring Requirements), VIII (PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements), IX (Limitation on Use of Flares), X (Additional Requirements for the Orange Incinerator), XI (Prohibition on Netting Credits or Offsets), and XII (Permits) of this Decree and has maintained operation of any Control Technology as required by this Consent Decree for a period of 24 consecutive Months at an individual Facility, Defendant may serve upon the Plaintiffs a request for termination pursuant to the requirements of Paragraph 119. If the United States and Plaintiff-State agree that the Decree as it relates to an individual Facility may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating those provisions of the Decree.

117. Termination as to Environmental Mitigation. After Defendant has paid the Section IV civil penalty and any stipulated penalties with respect to Environmental Mitigation due under this Consent Decree, and satisfied the requirements of Section V (Environmental Mitigation), Defendant may serve upon the United States and the applicable Plaintiff-State a

Request for Termination pursuant to the requirements of Paragraph 119. If the United States and the Plaintiff-State agree that the Decree as it relates to the requirements of Section V (Environmental Mitigation) may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating those provisions of the Decree.

118. Complete Termination. After Defendant has satisfied the requirements of Sections IV (Civil Penalty), V (Environmental Mitigation), VI (SO_2 Control Technology, Emissions Limits, and Monitoring Requirements), VII (NO_x Control Technology, Emissions Limits, and Monitoring Requirements), VIII (PM Control Technology, Emissions Limits, Best Management Practices, and Early Warning System Requirements), IX (Limitation on Use of Flares), X (Additional Requirements for the Orange Incinerator), XI (Prohibition on Netting Credits or Offsets), and XII (Permits) of this Decree and has maintained satisfactory compliance with the obligation to operate the Control Technology as required by this Consent Decree for a period of 24 consecutive Months at all Facilities, has complied with all other requirements of this Consent Decree, and has paid the civil penalty and any accrued stipulated penalties as required by this Consent Decree, Defendant may serve upon the United States and the applicable Plaintiff-State a request for termination pursuant to the requirements of Paragraph 119. If the United States and the Plaintiff-State agree that the Decree may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating the Decree.

119. Request for Termination. If Defendant elects to terminate this Consent Decree in whole or part, pursuant to Paragraphs 116 - 118, Defendant shall submit a written report to EPA and Plaintiff-State, as set forth in Section XXII (Notices), that (a) describes the activities undertaken, (b) attaches any applicable permits or SIP amendments obtained pursuant to the

requirements of Section XII (Permits) that incorporate the requirements that will survive termination of this Consent Decree that are listed in Paragraph 45, and (c) certifies that each of the applicable Sections listed Paragraphs 116 - 118 have been completed in full satisfaction of the requirements of this Consent Decree and that Defendant is in full compliance with those Sections of the Consent Decree. The report will contain the following certification, signed by an official of Defendant:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

120. If the Plaintiffs do not agree that the Consent Decree as a whole or as it relates to an individual Facility may be terminated, Defendant may invoke dispute resolution under Section XVIII (Dispute Resolution) of this Decree. However, Defendant shall not seek resolution of any dispute regarding termination under Section XVIII (Dispute Resolution) until 60 Days after service of its Request for Termination.

121. Effect of Shutdown. The permanent Shutdown of a Facility and the surrender of all permits related to its operation as a facility for the manufacture of carbon black shall be deemed to satisfy all requirements of this Consent Decree applicable to that Facility. After Defendant has permanently Shutdown a Facility and surrendered all permits related to its operation as a facility for the manufacture of carbon black, Defendant may serve upon the United States and the applicable Plaintiff-State a Request for Termination pursuant to the requirements of Paragraph 119. If the United States and the Plaintiff-State agree that the terminated Facility is

Shutdown and all permits related to its operation as a facility for the manufacture of carbon black have been surrendered, the Parties shall submit, for the Court's approval, a joint stipulation terminating those provisions of the Decree.

XXIX. SIGNATORIES/SERVICE

122. Each undersigned representative of Defendant and Plaintiff-State, and the Assistant Attorney General for the Environment and Natural Resources Division of the United States Department of Justice, certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party he or she represents to this document.

123. This Consent Decree may be signed in counterparts, and its validity shall not be challenged on that basis. Defendant agrees to accept service of process by mail with respect to all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons. All Parties agree that Defendant need not file an answer or otherwise respond to the Complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXX. INTEGRATION

124. This Consent Decree constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in the Decree and supersedes all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein. No other document, nor any representation, inducement,

agreement, understanding or promise constitutes any part of this Decree or the settlement it represents, nor shall it be used in construing the terms of this Decree.

XXXI. FINAL JUDGMENT

125. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment of the Court as to the Plaintiffs and Defendant.

XXXII. APPENDICES

126. The following Appendices are attached to and incorporated as part of this Consent Decree:

"Appendix A" contains the requirements of the Environmental Mitigation Projects.

"Appendix B" contains the Other PM Control Requirements.

"Appendix C" contains the Particulate Emissions Best Management Practices Control Plan.

"Appendix D" contains the PM Early Warning System requirements.

"Appendix E" contains the Protocol for Stack Test of Orange Incinerator.

"Appendix F" contains the Methodology for Determining Compliance with the Caps.

All terms in the Appendices shall be construed in a manner consistent with this Decree.

Dated and entered this ___ ___Day of _____, _____.

_____
United States District Court Judge

Signature Page for *United States of America* et al *v. Defendant Orion Engineered Carbons, LLC*, Consent Decree

FOR PLAINTIFF UNITED STATES OF AMERICA:

Jeffrey H. Wood

Date: 12/21/17

JEFFREY H. WOOD
Acting Assistant Attorney General
Environment and Natural Resources Division
United States Department of Justice

Katherine A. Abend

Date: 12/21/17

KATHERINE A. ABEND
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Jason A. Dunn

Date: 12/21/17

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Signature Page for *United States of America v. Defendant Orion Engineered Carbons, LLC,* Consent Decree

FOR PLAINTIFF UNITED STATES OF AMERICA:

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Signature Page for *United States of America* et al *v. Defendant Orion Engineered Carbons, LLC,* Consent Decree

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Date: 12/20/2017

LAWRENCE STARFIELD
Acting Assistant Administrator
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency

Date: 12/20/17

PHILLIP A. BROOKS
Director, Air Enforcement Division
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency

Date: 12/18/17

KELLIE ORTEGA
Attorney-Advisor, Air Enforcement Division
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency

Signature Page for *United States of America* et al. *v. Defendant Orion Engineered Carbons, LLC,* Consent Decree

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Date: 12/19/17

CHERYL T. SEAGER
Director
Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

Signature Page for *United States of America* et al. *v. Defendant Orion Engineered Carbons, LLC,* Consent Decree

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Date: 12/21/2017

T. LEVERETT NELSON
Regional Counsel
U.S. Environmental Protection Agency
Region 5

Date: 12-21-2017

WILLIAM WAGNER
Attorney-Adviser
United States Environmental Protection Agency
Region 5

Signature Page for *United States of America* et al. *v. Defendant Orion Engineered Carbons, LLC,* Consent Decree, subject to the public notice and comment requirements of La.R.S. 30:2050.7

FOR THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY:

Date 12/20/17

LOURDES ITURRALDE
Assistant Secretary
Office of Environmental Compliance
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, Louisiana 70821-4312

Date 12/20/17

PERRY THERIOT, LA BAR Roll# 19181
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Signature Page for *United States of America* et al. *v. Defendant Orion Engineered Carbons, LLC,* Consent Decree

FOR DEFENDANT, ORION ENGINEERED CARBONS, LLC

Signature _____ Date 12/21/17

Jack Clem
Chief Executive Officer
Orion Engineered Carbons, LLC

Signature _____ Date 12/21/17

Mark Peters
Senior Vice President and General Manager, Americas Region
Orion Engineered Carbons, LLC

APPENDIX A: ENVIRONMENTAL MITIGATION PROJECTS

A. Defendant shall comply with the requirements of this Appendix and with Section V (Environmental Mitigation) of the Consent Decree, to implement and secure the environmental benefits of the Environmental Mitigation Projects described below. Nothing in the Consent Decree or this Appendix shall require Defendant to spend any more than a total of $550,000 on Environmental Mitigation Projects.

B. Defendant shall implement the following Environmental Mitigation Projects and install and utilize the following equipment:

a. In order to minimize PM emissions during reactor shutdown scenarios at the Belpre, OH plant, Defendant shall replace an existing reactor vent scrubber with a high efficiency venturi scrubber on reactor vents from Units 2, 3, and 4. Defendant shall spend no less than $150,000 in Project Dollars on this Belpre project.

b. In order to minimize potential PM emissions from loading operations at the Ivanhoe, LA plant, Defendant shall install and operate a new vacuum system with a high efficiency cartridge filter in the bulk loading area. Defendant shall spend no less than $150,000 in Project Dollars on this Ivanhoe project.

c. In order to minimize potential PM emissions from the Orange, TX plant, Defendant shall install and operate PM reduction projects that may include some or all of the following projects:

   i. Install and operate a new vacuum system with a high efficiency cartridge filter in the bulk loading area.

   ii. Install and operate a new high efficiency cartridge filter to replace a vent sock on top of a product surge bin.

   Defendant shall spend no less than $210,000 in Project Dollars on this Orange project(s).

C. Each Environmental Mitigation Project shall be completed by no later than five years from the Effective Date of the Consent Decree. Any funds designated for a specific Environmental Mitigation Project that are left unspent, or are projected to be left unspent, after three years from the Effective Date of the Consent Decree may be redirected by Defendant, after consultation with and approval by EPA and the applicable Plaintiff-State, to one or more projects of the type listed in Paragraph B of this Appendix. Any such redirected funds shall be spent by no later than five years from the Effective Date of the Consent Decree.

APPENDIX B: OTHER PM CONTROL REQUIREMENTS

PM Emissions Equipment	PM Reduction Mechanism	Method for Managing PM Emissions
Carbon Black Product Storage Tank, Silo or Bin	PM emissions shall be directed to either (a) a fabric filtration device that is equipped with filters specified by their supplier to achieve a PM collection efficiency of at least 99%, or (b) a vacuum collection system that routes back to a Process Filter.	Provisions in Paragraph 35 (Other PM Control Requirements) of this Consent Decree
Carbon Black Pellet Dryer	All PM emissions shall be directed to the Purge Filter (for recovery of product) or to the Dryer Exhaust Bag Filter.	Provisions in Paragraphs 35 (Other PM Control Requirements) and 37 (PM Early Warning System) of this Consent Decree
Reactor	All carbon black product and PM emissions generated by the reactor shall be vented to a Main Unit Filter, a Reactor Sample Device or a Reactor Vent Scrubber. Direct venting to the atmosphere of any carbon black product or PM emissions generated by the reactor is prohibited at all times.	Provisions in Paragraph 35 (Other PM Control Requirements) of this Consent Decree and distributed control system interlocks to verify that the flow of water to the Reactor Vent Scrubber has been initiated
Main Unit Filters	During periods other than Heat Load Operation, reactor Startup and Shutdown and Malfunctions, the Main Unit Filter Heat Load Vents shall be closed.	Provisions in Paragraphs 35 (Other PM Control Requirements) and 37 (PM Early Warning System) of this Consent Decree
Process Filter and Purge Filter or Dryer Exhaust Bag Filter	All PM emissions shall be handled as part of the inherent process unit operations that employ fabric filtration to separate carbon black product, in accordance with the Compliance Assurance Monitoring Regulations under 40 C.F.R. Part 64.	Provisions in Paragraphs 35 (Other PM Control Requirements) and 37 (PM Early Warning System) of this Consent Decree

APPENDIX C: PARTICULATE EMISSIONS BEST MANAGEMENT PRACTICES CONTROL PLAN

The best management practices for minimizing particulate emissions described in this plan shall be followed at each of the Facilities at all times.

1. Key operations and maintenance personnel shall be trained to both recognize leaks and spills of carbon black, and to report them to the proper plant personnel for response. Visual observation of the physical condition of plant process equipment that conveys, stores, loads, unloads, and packages carbon black, including at connection points between equipment and/or sections of piping, and of the physical condition of containers and bags used to package carbon black, shall be part of the daily responsibilities of the operations and maintenance personnel to help ensure that potential leaks are addressed before they occur.

2. All carbon black product shall be stored in tanks, silos, hopper cars or trucks or closed bags. No carbon black product shall be stored unpackaged in open piles.

3. All product and off-quality carbon black shall be shipped off-site in closed bags or sealed rail cars, hoppers, or bulk transport trucks.

4. All process equipment at the Facilities shall be designed, operated, and maintained in a manner intended to minimize leaks and spills of carbon black and fugitive particulate emissions. In addition, the Facilities shall develop and implement practices to collect carbon black dust otherwise emitted from product conveyance, packaging, and storage operations, and either recycle it back into the manufacturing process or convey it to a packaging system. Where practicable, the operation of such equipment, including carbon black product conveyors, elevators, and packing units, shall be conducted under negative pressure and served by vacuum systems that collect carbon black.

5. All process equipment shall be located either indoors or in outdoor areas that have paved or rock/gravel ground surfaces.

6. After the PM Early Warning System is installed, events that trigger the PM Early Warning System shall be handled pursuant to the protocol in Appendix D (PM Early Warning System) of this Consent Decree. Leaks and spills of all carbon black that are otherwise identified shall be investigated and addressed (cleaned up and repaired) either immediately upon discovery or as quickly as practicable. When immediate repair is not feasible, a work order shall be developed and the actions taken to complete the repair shall be documented. Incident reports for spills or leaks of carbon black shall be created to document cause and corrective actions.

7. Special precautions shall be taken during maintenance actions to minimize particulate emissions. Prior to conducting maintenance or baghouse bag replacement on equipment that is prone to accumulation of carbon black on its interior surfaces, including, but not limited to, on the Main Unit Filters, Process Filters, Purge Filters, elevators and

conveyors, and storage tanks and silos, the responsible maintenance personnel shall identify and take steps necessary to minimize the generation of particulate emissions during the maintenance or bag replacement activity. The specific approaches taken to minimize particulate emissions during maintenance or bag replacement shall be developed on a case-specific basis based on the judgment of the maintenance personnel and shall include, as relevant, but need not be limited to, activities such as the following:

- vacuuming carbon black from the equipment prior to beginning the maintenance,
- vacuuming or washing down the equipment when an appropriate stage in the maintenance activity has been reached,
- if units are equipped with vents, closing vents during maintenance to prevent drafting of PM, except when Defendant conducts a safety or hazard analysis and concludes in writing that closing the vent would create an unsafe or unhealthy work atmosphere, and
- sealing filter bags removed from Main Unit Filters inside plastic bags.

8. Accessible floor and/or ground surfaces in the carbon black production areas shall be swept or washed as needed in order to clean up (and therefore minimize particulate emissions attributable to) leaks or spills of carbon black that are not otherwise identified and/or addressed during the daily Visual Assessments conducted pursuant to Paragraph 35 of this Consent Decree. All material collected through these actions shall either be incorporated into product for commercial distribution or properly disposed of in accordance with applicable regulatory standards.

APPENDIX D: PM EARLY WARNING SYSTEM

1. Defendant shall install a PM Early Warning System at each of its Facilities to monitor the PM emitted from each PM Monitor Point. Each PM Monitor Point shall be set to a specific alarm action level, such that an alarm is triggered when the PM at a PM Monitor Point exceeds the normal range of PM during operation of the Process System.

2. By the dates in the table below, Defendant shall submit for Plaintiffs' approval, alarm action levels for each PM Monitor Point, in accordance with Paragraph 1 of this Appendix D, and Defendant shall set each PM Early Warning System to such alarm action levels:

Process System	**Action Level Submission for Approval Date**	**Action Level Set Date**
Orange Process System	Within 335 Days of the Effective Date of this Consent Decree	Within 365 Days of the Effective Date of this Consent Decree
Ivanhoe (Franklin) Process System	Within 335 Days of the Effective Date of this Consent Decree	365 Days of the Effective Date of this Consent Decree
Borger Process System	Within 335 Days of the Effective Date of this Consent Decree	365 Days of the Effective Date of this Consent Decree
Belpre Process System	Within 335 Days of the Effective Date of this Consent Decree	Within 365 Days of the Effective Date of this Consent Decree

3. Defendant shall operate each PM Early Warning System at all times of Heat Load Operation and Process System Operation, except for during system breakdowns, repairs, maintenance, calibration checks, and zero and span adjustments of the applicable PM Early Warning System. For purposes of demonstrating compliance with the requirements in Paragraph 2 of this Appendix D, the minimum degree of data availability shall be at least 90 percent for the first three years following the Effective Date of the Consent Decree, and 95% thereafter, based on a quarterly average of the operating time of the emission unit or activity being monitored.

4. In the event that an alarm is triggered for any PM Early Warning System, Defendant shall investigate the cause of the alarm as expeditiously as practicable by performing each of the following tasks:

   a. Reviewing the data output for the relevant PM Early Warning System to determine whether the alarm corresponds to an actual increase in PM emissions;

   b. If review of the data confirms an increase in PM emissions, having a Method 9 Trained Observer (i) conduct a visual assessment of the equipment monitored by the pertinent PM Early Warning System to determine if there are any detectable visual emissions, and, (ii) in the event that any such visible emissions are observed, conduct a six minute observation in accordance with Method 9 to determine if opacity levels are greater than 20%, and (iii) if opacity levels are greater than 20%, conduct a six minute observation in accordance with Method 9 once every 8 hours until visible emissions are less than 20% of opacity levels.

   c. If the visual assessment or other observations identify a process, equipment or other condition(s) causing an increase in PM emissions that may be responsible for triggering the relevant alarm, determining whether the relevant equipment can be isolated to reduce the excess PM emissions below alarm levels, without requiring a Process System Shutdown;

   d. If the relevant equipment can be isolated without requiring Process System Shutdown, isolating and repairing such equipment prior to returning it to service;

   e. If the relevant equipment cannot be isolated without requiring Process System Shutdown, such as if there is a leak from a dryer, a broken bag in a baghouse, or a Malfunction of any other component that cannot be isolated to the extent necessary to prevent continued excess PM emissions, shutting down the relevant equipment and only returning it to service after it has been repaired;

   f. If, after investigation, the source of any elevated PM emissions cannot be identified, shutting down the subject equipment as soon as practicable to prevent further alarms and to minimize emissions and ensure the safety of employees and the community and only returning the equipment to service after the source of the excess emissions has been identified and repaired; and

5. Notwithstanding the foregoing, to the extent that recorded information for the relevant PM Early Warning System indicates that PM emissions have returned to normal operating ranges, below levels triggering an alarm condition, Defendant is not otherwise obligated to continue with implementation of the steps listed above, and may continue operation of the relevant equipment.

6. Defendant shall maintain a record of any event that triggers the alarm for any PM Early Warning System sufficient to meet the requirements in Section XIV (Recordkeeping and Reporting Requirements) of this Consent Decree.

7. Each Operating Day, Defendant's personnel shall visually review the recorded data for each PM Early Warning System to identify any trends in relative PM emissions that may reflect an escalation in PM emissions from a monitored process unit.

8. Defendant shall perform routine maintenance of each PM Early Warning System installed pursuant to this Appendix D and Paragraph 37 of this Consent Decree in accordance with any manufacturer recommendations and the following requirements:

    a. On at least a semiannual basis, Defendant shall visually inspect and clean each sensor within the PM Early Warning System, evaluate the response of the sensor to variation in purge air flow rates to verify that flow is exiting the purge ports for each sensor, to the extent warranted based on the visual inspection and purge air flow test, perform any necessary maintenance to ensure continued effective operation of the PM Early Warning System.

    b. On at least an annual basis, Defendant shall comprehensively inspect the PM Early Warning System and make any necessary repairs.

9. The PM Early Warning System shall not be required to quantitatively measure PM emissions.

APPENDIX E: PROTOCOL FOR STACK TEST OF ORANGE INCINERATOR

1. The stack test shall comply with the terms of the December 16, 2014 test protocol submitted to the EPA related to the Orange Incinerator, except as modified by Paragraph 3 of this Appendix E. The December 16, 2014 test protocol addresses the following pollutants and parameters and specifies use of the methods in 40 C.F.R. Part 60 Appendix A and Part 51 Appendix M:

    a. Flow in dry and wet standard cubic feet per minute using Methods 1 and 2;
    b. Oxygen concentration in volume percent using Method 3A;
    c. Sulfur dioxide in parts per million dry and wet each at actual O2 and corrected to 0% O2, in pounds per hour, and in pounds per ton of carbon black produced using Method 6A or 6C;
    d. Sulfur trioxide in parts per million dry and wet each at actual O2 and corrected to 0% O2, in pounds per hour, and in pounds per ton of carbon black produced using Method 8;
    e. Nitrogen oxides in parts per million dry and wet each at actual O2 and corrected to 0% O2, in pounds per hour, and in pounds per ton of carbon black produced using Methods 7 or 7E;
    f. Filterable particulate matter in grains per dry standard cubic foot, in pounds per hour, and in pounds per ton of carbon black produced using Methods 5 and 5B;
    g. Carbon monoxide in parts per million dry and wet each at actual O2 and corrected to 0% O2, in pounds per hour, and in pounds per ton of carbon black produced using Method 10; and
    h. Volatile organic compounds in parts per million dry and wet each at actual O2 and corrected to 0% O2, in pounds per hour, and in pounds per ton of carbon black produced using Methods 18 and 25A.

2. For each run of each test, the following process parameters shall be recorded and averaged on an hourly average basis over the full course of the sampling period:

    a. Tail Gas flow rate (in dscfm) and netting value (in btu/scf);
    b. Fuel rate and type (gpm for liquid fuel and dscfm for gaseous);
    c. Average incinerator flue gas temperature (degrees F); and
    d. Average incinerator flue gas O2 content (volume percent).

3. During the stack test, the Process System will be running on a grade mix and operating reactors at conditions to achieve at least 90% of Process System capacity. The stack test shall consist of one six-hour run during which the three units are each producing different grades.

APPENDIX F: METHODOLOGY FOR DETERMINING COMPLIANCE WITH CAPS

1. Borger SO_2 Cap. For purposes of determining compliance with the Borger SO2 Cap and Paragraph 20, SO_2 emissions shall be determined by calculating the total SO_2 emissions from each SO_2 emission unit at Borger, as follows:

Total SO_2 in tpy = Total SO_2 from Flares in tpy + Total SO_2 from Borger Waste Heat Boiler in tpy

Where:

Total SO_2 from Flares = (0.007056 tons SO_2/bbls feedstock)(total bbls feedstock fed to the reactors during Flare operation per year)(average % sulfur in feedstock for the year/2.8)

Where the sulfur factor of 0.007056 was derived based upon maximum emissions from the Flare at a maximum feedstock use of 1,201,346 bbls/yr, at a feedstock sulfur content of 2.8%, as specified in the PSD permit application filed with TCEQ on August 21, 2001 (permit issued October 3, 2002).

Where the average % sulfur in feedstock for the year will be calculated following the equations in Paragraph 22.

Total SO_2 from Borger Waste Heat Boiler = lb/hr of SO_2, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 19, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

Total SO2 from Borger Waste Heat Boiler will be measured with or without scrubbing technology, depending whether Borger or Belpre receives the scrubbing technology pursuant to Paragraph 16.

Example Calculation: A total of 160,000 bbls of feedstock was fed to the Reactors during the time the Flares were operated for the year. The average feedstock sulfur concentration was 2.6%. The SO_2 measured by the Borger Waste Heat Boiler CEMS for the year was 3,225 tons.

Total SO_2 in tpy = (0.007056 tons SO_2/bbls feedstock)(160,000 bbls feedstock)(2.6/2.8) + 3,225 tpy = 4,273 tpy

2. Belpre SO_2 Cap. For purposes of determining compliance with the Belpre SO_2 Cap and Paragraph 20, SO_2 emissions shall be determined by calculating the total SO_2 emissions from each SO_2 emission unit at Belpre, as follows:

Total SO2 in tpy = Total SO2 from Flares in tpy + Total SO2 from Central Stack in tpy + Total SO2 from T.O. Stack in tpy + Total SO2 from scrubber/SCR stack in tpy (if applicable)

Where:

% Sulfur in Feedstock will be calculated following the equations in Paragraph 22.

The factor 2.0 in each of the following three equations is the ratio of the molecular weight of SO2 to the molecular weight of sulfur, i.e. 64/32.

T.O. = thermal oxidizer

Combustion efficiency represents the conversion rate of S to SO_2 for purposes of this Appendix. The combustion efficiencies of the T.O. and Driers (i.e., Central Stack emissions) were determined by stack testing during the mid-1990s. The combustion efficiency of the flare is based upon AP-42 factors.

Production = carbon black produced

% Sulfur on Production is measured by daily testing of a sample from each unit using x-ray fluorescence.

Split Flare Stack versus Central Stack in % is assumed, for the purposes of this Appendix F, to be a fixed value of 66% and 34%, respectively. This split was confirmed in the 1990s using tail gas sampling and material balance techniques and has been used at Belpre since then.

Total SO2 from Flares = SO2 from Unit 1 + SO2 from Unit 2.

Where:

SO2 for each Unit = (((% Sulfur in Feedstock)(Feedstock Usage in tpy)) – ((% Sulfur on Production)(Production in tpy)))(Split Flare Stack versus Central Stack in %)(Combustion Efficiency in %)(2.0)

Total SO2 from Central Stack = SO2 from Unit 1 Dryer + SO2 from Unit 2 Dryer.

Where:

SO2 for each Dryer = (((% Sulfur in Feedstock)(Feedstock Usage in tpy)) – ((% Sulfur on Production)(Production in tpy)))(Split Central Stack versus Flare Stack in %)(Combustion Efficiency in %)(2.0)

Total SO2 from T.O. Stack = SO2 from Unit 3 + SO2 from Unit 4.

Where:

SO2 for each unit = (((% Sulfur in Feedstock)(Feedstock Usage in tpy)) – ((% Sulfur on Production)(Production in tpy)))(2.0)

Total SO2 from scrubber/SCR stack = lb/hr of SO_2, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 19, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

If no scrubbing technology is employed, depending whether Borger or Belpre receives the scrubbing technology pursuant to Paragraph 16, the equation will have no scrubber/SCR stack parameter.

Example Calculation:

		Flare Stack Unit 1	Flare Stack Unit 2	Central Stack Unit 1 Dryer	Central Stack Unit 2 Dryer	T.O. Stack Unit 3	T.O. Stack Unit 4
% Sulfur in Feedstock	A	1.22%	0.55%			0.79%	0.48%
Feedstock Usage in tpy	B	58,694	36,664			18,748	16,002
Sulfur input in tpy	C = (A*B)	716	202			148	77
% Sulfur on Production	D	0.73%	0.34%			0.68%	0.36%
Production in tpy	E	35,481	19,987			10,591	8,512
Sulfur out in production tpy	F = (D*E) / 100	259	68			72	31
Sulfur emitted in tpy	G = C-F	457	134			76	46
Split Central Stack versus Flare Stack in %	H	66%	66%	34%	34%	100%	100%
Combustion Efficiency in %	I	98%	98%	98%	98%	100%	100%
Unit SO2 emissions in tpy	= (G*H*I*2.0)	591	173	305	89	152	92
		Total SO2 from Flares = 764 tpy		Total SO2 from Central Stack = 394 tpy		Total SO2 from T.O. Stack = 245 tpy	
Total SO2 in tpy		1,403 tpy					

3. Ivanhoe SO_2 Cap. For purposes of determining compliance with the Ivanhoe SO_2 Cap and Paragraph 20, SO_2 emissions shall be determined by calculating the total SO_2 emissions from each SO_2 emission unit at Ivanhoe, as follows:

Total SO2 in tpy = Total SO2 from Flares in tpy + Total SO2 from Dryers in tpy + Total SO2 from scrubber/SCR stack in tpy

Where:

Total SO2 from Flares + Total SO2 from Dryers = (0.20974 tons SO2/kilogallons feedstock)(% sulfur in feedstock/4.0)(kilogallons of feedstock used)

Where the sulfur factor of 0.20974 tons SO2/kilogallons feedstock was determined by averaging the past total SO2 for five years of emissions inventory statements and dividing it by the average total feedstock used for each year in thousands of gallons. Since the maximum feedstock sulfur limit is 4.0% and all permit limits were based upon that number, the emissions for each year were scaled by the factor of the actual feedstock sulfur percent for the year divided by 4.0.

Where the % sulfur in feedstock will be calculated following the equations in Paragraph 22.

Total SO2 from scrubber/SCR stack = lb/hr of SO_2, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 19, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

4. Borger NO_x Cap. For purposes of determining compliance with Paragraph 29, NO_x emissions shall be determined by calculating the total NO_x emissions from each NO_x emission unit at Borger, as follows:

Total NO_x in tpy = Total NO_x from Flares in tpy + Total NO_x from Dryers in tpy + Total NO_x from Borger Waste Heat Boiler in tpy

Where:

Total NO_x from Flares = (0.000551 tons NO_x/bbls feedstock)(total bbls of feedstock fed to the reactors during Flare operation per year)

Total NO_x from Dryers = (0.000036 tons NO_x/bbls feedstock)(total bbls of feedstock fed to the reactors during Flare operation per year)

Where the NOx factors for the Flares and dryers were derived based upon data specified in the PSD permit application filed with TCEQ on August 21, 2001 (permit issued October 3, 2002), including AP-42 factors for natural gas fired naturally aspirated equipment.

Total NO_x from Borger Waste Heat Boiler = lb/hr of NO_x, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 28, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

Example Calculation: A total of 160,000 bbls of feedstock was fed to the Reactors during the time the Flares were operated for the year. 700,000 bbls of feedstock was used for the year during Dryer operation. The NO_x measured by the Borger Waste Heat Boiler CEMS for the year was 150 tpy.

Total NO_x in tpy = (0.000551 tons NO_x/bbls feedstock)(160,000 bbls of feedstock) + (0.000036)(700,000 bbls of feedstock) + 150 tpy = 256 tpy

5. Belpre NO_x Cap. For purposes of determining compliance with Paragraph 29, NO_x emissions shall be determined by calculating the total NO_x emissions from each NO_x emission unit at Belpre, as follows:

Total NOx in tpy = Total NOx from Flares in tpy + Total NOx from Central Stack in tpy + Total NOx from T.O. Stack in tpy + Total NOx from scrubber/SCR stack in tpy

Where:

Total NOx from Flares in tpy = (2.140 lbs NOx/million pounds carbon black)(million pounds of carbon black produced)/(2000)

Total NOx from Central Stack in tpy = (3.340 lbs NOx/million pounds carbon black)(million pounds of carbon black produced)/(2000)

Total NOx from T.O. Stack in tpy = (6.080 lbs NOx/million pounds carbon black)(million pounds of carbon black produced)/(2000)

Where the NOx factors were derived from the average of the last five annual stack tests, as required by Ohio EPA in the plant's Title V permit.

Total NOx from scrubber/SCR stack in tpy = lb/hr of NO_x, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 28, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

6. Ivanhoe NO_x Cap. For purposes of determining compliance with Paragraph 29, NO_x emissions shall be determined by calculating the total NO_x emissions from each NO_x emission unit at Ivanhoe, as follows:

Total NOx in tpy = Total NOx from Flares in tpy + Total NOx from Dryers in tpy + Total NOx from scrubber/SCR stack in tpy

Where:

Total NOx from Flares + Total NOx from Dryers = (0.02102 tons NOx/kilogallons feedstock)(kilogallons feedstock used)

Where the NOx factor of 0.02102 tons NOx/kilogallons feedstock was determined by averaging the past total NOx for five years of emissions inventory statement and dividing by the average total feedstock used for each year in thousands of gallons.

Total NOx from scrubbers/SCR stack = lb/hr of NO_x, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 28, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

7. Orange NO_x Cap. For purposes of determining compliance with Paragraph 29, NO_x emissions shall be determined by calculating the total NO_x emissions from each NO_x emission unit at Orange, as follows:

Total NO_x in tpy = Total NO_x from Dryer Filters in tpy + Total NO_x from Dryers in tpy + Total NO_x from Orange Incinerator and Orange Co-Generation System in tpy

Where:

Total NO_x from Dryer Filters = (0.0000218 tons NO_x/bbls feedstock)(total bbls of feedstock fed to the reactors per year)

Total NO_x from Dryers = (0.000218 tons NO_x/bbls feedstock)(total bbls of feedstock fed to the reactors per year)

Where the NOx factors for the dryer filters and dryers were derived based upon data from stack-tests conducted in March-April 2015. The five emission points tested averaged 3.74 lb NOx/ton carbon black. In 2016, 66,177 tons of carbon black was produced at Orange and 566,897 barrels of feedstock was used to produce this.

Total NO_x from Orange Incinerator and Orange Co-Generation System = (for each) lb/hr of NO_x, recorded daily, and summed monthly and annually in tpy, measured by the CEMS specified in Paragraph 28, and a flow measuring device and associated software.

Where feedstock use is metered continuously and summed daily, monthly and annually.

Example Calculation: A total of 566,800 bbls of feedstock was fed to the Reactors for the year. The NO_x measured by the Orange Incinerator CEMS for the year was 150 tons.

Total NO_x in tpy = (0.000025 tons NO_x/bbls feedstock)(566,800 bbls feedstock) + (0.000250 tons NO_x/bbls feedstock)(566,800 bbls feedstock) + 150 tpy = 306 tpy

8. When reporting compliance with the Caps, Defendant shall provide complete emission calculations that specify each factor in each of the bolded equations in this Appendix F.