APPENDIX A

1. Model Discharge Burden Scenarios

The Agency performed an analysis of historical discharges – documented in the final rule RIA – to estimate the frequency of discharges to which the rule's requirements may apply. These data inform the subsequent analyses of annual burden and costs by providing the frequency of applicable discharges. The Agency consulted and examined three data sources describing historical incidents:

- U.S. Coast Guard (USCG) National Response Center (NRC) database[6];
- U.S. Department of Transportation's (DOT) Pipeline and Hazardous Material Safety Administration (PHMSA) database[7]; and,
- U.S. Department of the Interior's (DOI) Natural Resource Damage Assessment and Restoration Program (NRDAR Program) case map and document library.[8]

The Agency's analysis found that the final rule will apply to discharges that occur rarely based on historical data; an estimated two discharges every 10 years.

For a discharge that meets the rule's applicability criteria and for which dispersant use is authorized, the characteristics of the discharge will determine the use of dispersants, the corresponding extent of the monitoring effort and, consequently, the cost of compliance. The estimated costs are discharge-specific; for relatively small discharges, the RP's compliance cost may be relatively small in comparison to very large discharges, where the estimated compliance costs can be substantially higher.

The analysis includes costs for a range of hypothetical discharge scenarios. These scenarios exceed the volume and duration criteria specified in the rule: surface use of dispersants in response to oil discharges of more than 100,000 U.S. gallons occurring within 24 hours, and surface use of dispersants for more than 96 hours in response to an oil discharge, as directed by the OSC. The model discharges are designed to produce a reasonable and realistic scenario for each individual scenario, and to cover a range of discharge types and magnitudes across the scenarios. Each model discharge scenario is hypothetical and does not reflect specific parameters of individual historical incidents. The scenarios include two surface discharges and two subsurface discharges. Exhibit A-1 summarizes the characteristics for the scenarios.

Exhibit A-1: General Model Discharge Assumptions

General Assumptions	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Discharge Type	Surface	Surface	Subsurface	Subsurface
Discharge Size (U.S .gallons)	150,000	8.0 million	170 million	1 - 3 billion
Duration of active oil discharge, days	1	22	60	85
Oil discharge rate (gallons/day)[1]	~ 20,000	300,000 to 400,000	1.2 to 1.4 million	10 to 20 million

[6] U.S. Coast Guard, National Response Center Incident Database. 2020. http://nrc.uscg.mil/
[7] U.S. Department of Transportation (DOT), 2019a. Pipeline and Hazardous Material Safety Administration (PHMSA) Incident Database, https://www.phmsa.dot.gov/data-and-statistics/pipeline/distribution-transmission-gathering-lng-and-liquid-accident-and-incident-data
[8] U.S. Department of the Interior (DOI), Natural Resource Damage Assessment and Restoration Program (NRDAR Program) incident reports, https://www.cerc.usgs.gov/orda_docs/

General Assumptions	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Dispersant Application				
Duration of dispersant application, days	3	24	65	90
Quantity of dispersants applied,[2] gallons	5,000	425,000	1.8 million	10 to 12 million
Location of dispersant application	Surface	Surface	Surface & Subsurface	Surface & Subsurface
Dispersant Monitoring				
Duration of dispersant monitoring, days	5	27	65	90

Notes:

1) Sources include Buchholz et al. 2016 (Buchholz, Kurt, and et al. 2016. "Worst Case Discharge Analysis (Volume I)." Washington D.C.: U.S. Department of the Interior Bureau of Safety and Environmental Enforcement (BSEE), and USCG 2016 (U.S. Coast Guard, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency, Centers for Disease Control and Prevention, Minerals Management Service (USCG 2016). Special Monitoring of Applied Response Technologies).

2) In past discharges such as the Deepwater Horizon oil spill, approximately 40 percent of dispersants were applied to the subsurface (USCG 2011).

2. Unit Burden and Cost

This section presents unit burden and unit cost estimates on a per discharge basis for each discharge scenario. Burden estimates for data collection and reporting are then converted into annual and three-year total values.

2.1 Information on Dispersant Application

EPA assumes the burden associated with these requirements includes labor (hours) throughout the event to produce and revise the documentation. This includes an initial, one-time hourly burden to develop the required documentation, as well as potentially daily revisions and adjustments. The hour estimates below are based on EPA's best professional judgment.

EPA differentiates the effort required for this section of the rule slightly across the scenarios. Because the requirements and nature of the documentation are the same in all cases, the effort is similar for all four scenarios, but with scenarios 3 and 4 warranting additional hours given the scope and complexity of the model discharges (Exhibit A-2).

Exhibit A-2: Dispersant Application Documentation Labor Requirements (hours)

Dispersant Application Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Daily	One-Time	Daily	One-Time	Daily	One-Time	Daily
Document the characteristics of the source oil	8	--	8	--	8	--	10	--
Document dispersant choice, application method and procedures, and required equipment	8	1	8	1	8	1	10	1
Document the oil discharge flow rate and the results of any efficacy and toxicity tests	2	2	2	2	2	2	4	3
Document the discharge flow rate for volatile petroleum hydrocarbons	N/A	N/A	N/A	N/A	4	2	6	6
Total Hours	**18**	**3**	**18**	**3**	**22**	**5**	**30**	**10**

EPA used occupation-specific labor rates from the U.S. Bureau of Labor Statistics (BLS), Occupational Employment Statistics survey (OES) to develop labor costs. The Agency assumes the labor required for the dispersant application documentation is provided by the Emergency Management Director occupation in the oil and gas extraction industry, (NAICS 211100). The total labor rate is comprised of the hourly wage, obtained from BLS OES[9], and the cost of benefits/overhead obtained from the BLS Employee Cost of Compensation (ECC) survey.[10] According to the ECC data for oil and gas extraction, wages comprise 68.6 percent of total hourly labor cost; therefore, the Agency inflated the raw BLS wage by 1/.686 to estimate the fully-loaded labor rate reported in Exhibit A-3.

Exhibit A-3: Labor Rates for Dispersant Application Documentation ($2019)

BLS OCC Code	Occupation Description	NAICS	NAICS Description	Fully-Loaded Labor Rate ($/hr)
11-9160	Emergency Management Directors	211100	Oil and Gas Extraction	$120.19
Note: To estimate the wage rate, the Agency used Employer Cost of Compensation to estimate total value of benefits. The original wage rate of $82.45 was divided by BLS estimated component of private sector wages and salaries (68.6%) to account for the additional 31.4 percent of benefits usually paid as part of compensation.				

Exhibit A-4 presents the resulting unit costs for preparation of the dispersant application documentation.

Exhibit A-4: Unit Cost per Respondent for Dispersant Application Documentation ($2019)

Dispersant Application Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Daily	One-Time	Daily	One-Time	Daily	One-Time	Daily
Document the characteristics of the source oil	$962	$0	$962	$0	$962	$0	$1,202	$0
Document dispersant choice, application method and procedures, and required equipment	$962	$120	$962	$120	$962	$120	$1,202	$120
Document the oil discharge flow rate and the results of any efficacy and toxicity tests	$240	$240	$240	$240	$240	$240	$481	$361
Document the discharge flow rate for volatile petroleum hydrocarbons	$0	$0	$0	$0	$481	$240	$721	$721
Unit Cost	**$2,163**	**$361**	**$2,163**	**$361**	**$2,644**	**$601**	**$3,606**	**$1,202**

2.2 Water Column Sampling

EPA assumes that water column sampling occurs daily for the duration of the monitoring period defined previously for each scenario. Sampling will be conducted in a locations informed, daily, by trajectory modeling describing the likely transport of oil considering surface and subsurface currents and the oil properties in affected areas.

The results of daily water column sampling are required to be reported as part of the Daily Reporting compliance activities. Here, EPA estimates the cost for the respondent to collect and

[9] Bureau of Labor Statistics. 2020a. "May 2019 National Industry-Specific Occupational Employment and Wage Estimates." Accessed June 8, 2020. https://www.bls.gov/oes/current/oessrci.htm

[10] Bureau of Labor Statistics. 2020b. "Employer Costs For Employee Compensation – December 2019." Accessed June 8, 2020. https://www.bls.gov/news.release/ecec.nr0.htm

analyze the daily water samples in order to comply with the daily reporting requirements. Water sample collection and analysis activities that result in respondent burden and cost include:

- **Daily review and consultation using the latest results of trajectory modeling to determine locations to sample.** The costs analysis assumes that the RP will hire a contractor to perform trajectory modeling. Costs for this trajectory modeling as part of the oil distribution analysis are captured in the next section. EPA assumes that the RP incurs daily labor costs as part of the sampling requirements to review the trajectory modeling results to establish the day's sampling plan;
- **Daily collection of water column samples.** EPA assumes the RP collects background and in-plume water column samples daily by vessel. The cost for daily sample collection is driven by the cost of procuring an appropriately equipped vessel, including associated labor cost for staff/technicians operating the vessel and collecting the samples. Cost is also a function of the number of vessels deployed per day to collect samples. EPA assumes each event requires at least one vessel per day, though as indicated below, Scenario 2, 3 and 4 are assumed to require more than this minimum quantity; and,
- **Daily testing of water column samples.** Information on most sampling metrics can be obtained in real-time; however, some constituents require additional laboratory testing. These include: Heavy metals, polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPHs). EPA therefore includes additional daily laboratory testing costs for these specific constituents. Sample testing costs are a function of the cost per test per constituent, and the number of samples tested per day.

Labor Burden and Cost

Exhibit A-5 presents EPA's estimated labor burden hours required for daily oil distribution modeling review and daily analysis of sampling results.

Exhibit A-5: Daily Labor Requirements for Trajectory Modeling Review (hours per day)

Compliance Action	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Review trajectory modeling and determine daily sampling plan/locations	2	2	2	2
Analyze fluorometer and water sampling results	5	10	15	20
Notes: Cost for performing trajectory modeling as part of the oil distribution analysis is captured in Section 2.3.				

To monetize these labor costs, EPA used an Environmental Scientist fully-loaded labor rate from BLS data, and the same methodology described for labor rates presented in Exhibit A-3.

Exhibit A-6: Labor Rates for Water Column Sample Analysis ($2019)

BLS OCC Code	Occupation Description	NAICS	NAICS Description	Fully-Loaded Labor Rate ($/hr)
19-2040	Environmental Scientists and Geoscientists	211100	Oil and Gas Extraction	$110.83
Note: The Agency used Employer Cost of Compensation wage rate to calculate the total value of benefits. The wage rate of $76.03 was divided by BLS estimated component of private sector wages and salaries (68.6%) to account for the additional 31.4 percent of benefits usually paid as part of compensation (BLS 2020a; BLS 2020b).				

Exhibit A-7 presents the unit cost per day for review and analysis of sampling and trajectory modeling.

Exhibit A-7: Unit Cost per Day for Respondent Analysis & Trajectory Modeling Review ($2019)

Compliance Action	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Review trajectory modeling and determine daily sampling plan/locations	$222	$222	$222	$222
Analyze fluorometer and water sampling results	$554	$1,108	$1,662	$2,217
Total	$776	$1,330	$1,884	$2,438

Other Equipment and Laboratory Costs

EPA assumes the RP will use an oil response vessel, the cost for which includes both the cost of the vessel itself and required crew capable of collecting water samples used for dispersant monitoring. Costs for additional equipment include one fluorometer and one water meter per vessel. The combined cost for these two instruments is $835 per day, per vessel.[11] EPA also assumes that additional sampling equipment, beyond equipment already present on the collection vessels, may be required. Costs also include procuring two submersible laser-diffraction based particle size analyzers (e.g. LISST-Deep, LISST-Halo2), at an assumed cost of $1,000 per instrument per day. EPA assumes that the use of two LISST instruments is needed to cover the rule's required droplet size distribution analysis.

The Agency assumed the RP monitoring vessel conducts real-time water column monitoring and water-sample collection for later analysis. The cost of $21,600 per day, per vessel, is for a 20 meters EARL oil spill response vessel or equivalent, including crew, converted to USD from British Pounds.[12]

The Agency also consulted data from Water Testing Labs for unit costs per sample for laboratory testing of certain sample constituents.[13]

The extent of sampling depends on the area of the discharge, the depth of the oil plume, currents, and other factors. Therefore, the number of water samples collected specifically for dispersant monitoring is difficult to generalize because it will be unique for each individual discharge and largely dependent on the area of the discharge (see Exhibit A-8). For the RP monitoring vessel, EPA assumes:

- Scenario 1: The RP utilizes one vessel per day for surface monitoring;
- Scenario 2: The RP utilizes two vessels per day for surface monitoring;
- Scenario 3: The RP utilizes one vessel per day for subsurface monitoring, and three vessels per day for surface monitoring, for a total of four vessels per day; and,

[11] Oil Spill Response Limited. 2020. "Scale OF Fees 2020." Oil Spill Response. https://www.oilspillresponse.com/globalassets/activate-us/scale-of-fees/scale-of-fees-2020.pdf

[12] Ibid.

[13] Water Testing Labs. 2020. "Price List Wastewater Testing Water Analysis Maryland, Virginia, Delaware, Washington DC." Accessed April 16, 2020. https://www.wtlmd.com/wastewater-testing-pricing-maryland-md-va-dc-de.php

- Scenario 4: The RP utilizes two vessels per day for subsurface, and five vessels per day for surface monitoring, for a total of seven vessels per day.

Exhibit A-8 presents these assumptions and the daily equipment cost based on the number of vessels utilized per day in each scenario.

Exhibit A-8: Equipment Unit Costs for Water Column Sampling ($2019)

Equipment	Scenario 1	Scenario 2	Scenario 3	Scenario 4
RP Monitoring Vessel, cost per day	1 vessel	2 vessels	4 vessels	7 vessels
	Surface monitoring only	Surface monitoring only	Surface and Subsurface monitoring	Surface and Subsurface monitoring
	$21,600	$43,200	$86,400	$151,200
Fluorometer and Water Quality Meter (one per vessel), cost per day	$835	$1,584	$3,168	$5,544
LISST (two instruments), cost per day	$2,000	$2,000	$2,000	$2,000
Dispersant Water Column Samples	25	50	250	400
Source: USCG 2011, Oil Spill Response Limited 2020[14]. Notes: Assumes the RP monitoring vessel conducts real-time water column monitoring and water-sample collection for later analysis. The cost is for a 20 meters EARL oil spill response vessel or equivalent, including crew, converted to USD from British Pounds (Oil Spill Response Limited 2020) based on total inventory of USCG during the Deepwater Horizon oil spill.				

As noted above, the number of samples collected daily is a required input. The RP can complete some tests with equipment on-hand in the sampling vessels. The RP will also transport a subset of additional tests to an onshore testing facility to complete the water quality tests. Exhibit A-9 presents the unit cost per sample for this analysis.

Exhibit A-9: Off-Site Water Column Sampling Testing Unit Costs

Parameter Description	Cost per Test	Notes / Source
Oil & Grease	$150	EPA 1664
Heavy Metals	$72	This is the average of $48 and $95. The Agency's research found heavy metal water sampling tests generally fall within this range.
Polycyclic aromatic hydrocarbons (PAH)	$400	For subset of water samples.
Total petroleum hydrocarbons, or Total extractable hydrocarbons (THE)	$320	Analyzed all water samples.
Source: Abt Associates, and Water Testing Labs. 2020. "Price List Wastewater Testing Water Analysis Maryland, Virginia, Delaware, Washington DC." Accessed April 16, 2020. https://www.wtlmd.com/wastewater-testing-pricing-maryland-md-va-dc-de.php		

2.3 Oil Distribution Analysis

EPA estimates the cost of obtaining access to and running trajectory and related oil distribution model(s). This modeling and analysis will allow the RP to characterize the boundaries of the dispersed oil, tailor, or optimize sampling design and characterize the dispersant effectiveness to evaluate the changes in the condition of the oil due to weathering. EPA assumes the cost includes hiring a modeling contractor who has this modeling capability, and the associated labor for

[14] This data source, along with the Water Testing Labs source referenced in Exhibit A-9, was also used by the American Petroleum Institute (API) and the National Ocean Industries Association (NOIA) in the monitoring cost estimate provided in their public comment submission following the 2015 NPRM (comment docket ID # EPA–HQ–OPA–2006–0090–0518–A1).

between one and three consultants per day. These labor requirements are presented in Exhibit A-10.

Exhibit A-10: Daily Oil Distribution Analyses Labor Burden (hours)

Parameter Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Characterize the boundaries of the dispersed oil.	2	2	4	6
Tailor or optimize sampling design.	2	2	4	6
Characterize the dispersant effectiveness to determine the changes in the condition of the oil due to weathering.	4	4	8	12
Total Hours per Day	**8**	**8**	**16**	**24**

EPA developed labor costs using occupation-specific fully-loaded rates from the U.S. Bureau of Labor Statistics. EPA assumes the oil distribution analysis labor is provided by the Environmental Scientists and Geoscientists occupation in the management, scientific, and technical consulting services industry (NAICS 541600).

Exhibit A-11: Labor Rates for Oil Distribution Analysis ($2019)

BLS OCC Code	Occupation Description	NAICS	NAICS Description	Fully-Loaded Labor Rate ($/hr)
19-2040	Environmental Scientists and Geoscientists	541600	Management, Scientific, and Technical Consulting Services	$57.46
Source: EPA calculated the fully-loaded wage rate using the Employer Cost of Compensation to estimate total value of benefits. The original wage rate of $39.42 was divided by BLS estimated component of private sector wages and salaries (68.6%) to account for the additional 31.4 percent of benefits usually paid as part of compensation (BLS 2020a and BLS 2020b).				

Exhibit A-12 presents respondent daily unit costs for the oil distribution analysis.

Exhibit A-12: Daily Oil Distribution Analyses Unit Cost ($2019)

Parameter Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Characterize the boundaries of the dispersed oil.	$115	$115	$230	$345
Tailor or optimize sampling design.	$115	$115	$230	$345
Characterize the dispersant effectiveness to determine the changes in the condition of the oil due to weathering.	$230	$230	$460	$690
Unit Cost per Day	**$460**	**$460**	**$919**	**$1,379**

2.4 Ecological Characterization

EPA assumes that the characterization of ecological receptors requires a one-time use of labor to conduct the study based on existing sources of information. The ecological characterization analysis is performed by an Environmental Scientist employed by the RP. In addition, the RP is tasked with determining an acute toxicity level of concern. The Agency assumes that toxicity analysis and monitoring occurs as part of the previously described water column sampling, including background sampling, and therefore, no additional costs are associated with this activity (Exhibit A-13).

Parameter Description	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Daily	One-Time	Daily	One-Time	Daily	One-Time	Daily
Develop Ecological Characterization	24	-	40	-	80	-	100	-

Study								

Exhibit A-13: Ecological Characterization Labor Burden (hours)

Exhibit A-14 presents the corresponding fully-loaded labor rate for an Environmental Scientists/Geoscientists in the oil and gas extraction industry, (NAICS 211100).

Exhibit A-14: Labor Rate for Ecological Characterization Study ($2019)

BLS OCC Code	Occupation Description	NAICS	NAICS Description	Fully-Loaded Labor Rate ($/hr)
19-2040	Environmental Scientists and Geoscientists	211100	Oil and Gas Extraction	$110.83
Source: EPA calculated the fully-loaded wage rate using the Employer Cost of Compensation to estimate total value of benefits. The original wage rate of $76.03 was divided by BLS estimated component of private sector wages and salaries (68.6%) to account for the additional 31.4 percent of benefits usually paid as part of compensation BLS 2020a and BLS 2020b.				

Exhibit A-15 presents the per-respondent unit cost for developing the ecological characterization.

Exhibit A-15: Unit Costs for Ecological Characterization ($2019)

Parameter Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Develop Ecological Characterization Study.	$2,660	$4,433	$8,866	$11,083

2.5 Immediate Reporting

EPA assumes the immediate reporting will require an Emergency Response Manager to spend one hour per day to fulfill the immediate reporting requirements across all scenarios. EPA assumes the same labor requirements apply across all scenarios (Exhibit A-16).

Exhibit A-16: Immediate Reporting Labor Burden (hours per day)

Parameter Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Immediate reporting of ecological receptors.	0.5	0.5	0.5	0.5
Immediately report to the OSC any deviation of more than 10 percent.	0.5	0.5	0.5	0.5
Total	**1**	**1**	**1**	**1**

Exhibit A-17 presents the respondents' daily unit cost for immediate reporting.

Exhibit A-17: Unit Cost per Day for Immediate Reporting ($2019)

Parameter Description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Immediate reporting of ecological receptors.	$60	$60	$60	$60
Immediately report to the OSC any deviation of more than 10 percent.	$60	$60	$60	$60
Total	**$120**	**$120**	**$120**	**$120**

2.6 Daily Reporting

EPA assumes that daily reporting will require 2.5 hours per day of an Emergency Response Manager's time across all scenarios (Exhibit A-18).

Exhibit A-18: Daily Reporting Labor Burden (hours per day)

Parameter description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Daily reporting of sampling and data analyses	0.5	0.5	0.5	0.5
Reporting total amount of dispersant used for the previous reporting period	1	1	1	1
Report the estimated daily transport of dispersed and non-dispersed oil	1	1	1	1
Total	**2.5**	**2.5**	**2.5**	**2.5**

Exhibit A-19 presents the respondents' daily unit cost for daily reporting.

Exhibit A-19: Unit Cost per Day for Daily Reporting ($2019)

Parameter description	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Daily reporting of sampling and data analyses	$60	$60	$60	$60
Reporting total amount of dispersant used for the previous reporting period	$120	$120	$120	$120
Report the estimated daily transport of dispersed and non-dispersed oil	$120	$120	$120	$120
Total	**$300**	**$300**	**$300**	**$300**

2.7 Summary of Total Unit Costs per Respondent, by Discharge Scenario

The unit labor burden and costs for each respondent to comply with the information collection requirements are presented in Exhibit A-20 and Exhibit A-21.

Exhibit A-20: Summary of Respondent Unit Labor Burden (hours)

Information Collection Activity	Burden Hours							
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Per-Day	One-Time	Per-Day	One-Time	Per-Day	One-Time	Per-Day
Dispersant Application Documentation	**18**	**3**	**18**	**3**	**22**	**5**	**30**	**10**
Document the characteristics of the source oil	8	0	8	0	8	0	10	0
Document dispersant choice, application method and procedures, and required equipment	8	1	8	1	8	1	10	1
Document the oil discharge flow rate and the results of any efficacy and toxicity tests	2	2	2	2	2	2	4	3
Document the discharge flow rate for volatile petroleum hydrocarbons	0	0	0	0	4	2	6	6
Water Column Sampling	**0**	**7**	**0**	**12**	**0**	**17**	**0**	**22**
Review trajectory modeling and determine daily sampling plan/locations	0	2	0	2	0	2	0	2
Analyze fluorometer and water sampling results	0	5	0	10	0	15	0	20
Oil Distribution Analysis	**0**	**8**	**0**	**8**	**0**	**16**	**0**	**24**
Characterize the boundaries of the dispersed oil.	0	2	0	2	0	4	0	6
Tailor or optimize sampling design.	0	2	0	2	0	4	0	6
Characterize the dispersant effectiveness to determine the changes in the condition of the oil due to weathering.	0	4	0	4	0	8	0	12

Ecological Characterization	**24**	**0**	**40**	**0**	**80**	**0**	**100**	**0**
Immediate Reporting	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**
Immediate reporting of ecological receptors.	0	0.5	0	0.5	0	0.5	0	0.5
Immediately report to the OSC any deviation of more than 10 percent.	0	0.5	0	0.5	0	0.5	0	0.5
Daily Reporting	**0**	**2.5**	**0**	**2.5**	**0**	**2.5**	**0**	**2.5**
Daily reporting of sampling and data analyses	0	0.5	0	0.5	0	0.5	0	0.5
Reporting total amount of dispersant used for the previous reporting period	0	1	0	1	0	1	0	1
Report the estimated daily transport of dispersed and non-dispersed oil	0	1	0	1	0	1	0	1
Total Labor Burden per Respondent per Discharge	**42**	**21.5**	**58**	**26.5**	**102**	**41.5**	**130**	**59.5**

Exhibit A-21: Summary of Respondent Unit Cost ($2019)

Information Collection Activity	Unit Cost							
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Per- Day	One-Time	Per-Day	One-Time	Per-Day	One-Time	Per- Day
Dispersant Application Documentation	**$2,163**	**$361**	**$2,163**	**$361**	**$2,644**	**$601**	**$3,606**	**$1,202**
Document the characteristics of the source oil	$962	$0	$962	$0	$962	$0	$1,202	$0
Document dispersant choice, application method and procedures, and required equipment	$962	$120	$962	$120	$962	$120	$1,202	$120
Document the oil discharge flow rate and the results of any efficacy and toxicity tests	$240	$240	$240	$240	$240	$240	$481	$361
Document the discharge flow rate for volatile petroleum hydrocarbons	$0	$0	$0	$0	$481	$240	$721	$721
Water Column Sampling	**$0**	**$26,152**	**$0**	**$49,055**	**$0**	**$94,394**	**$0**	**$162,124**
Labor Burden	*$0*	*$776*	*$0*	*$1,330*	*$0*	*$1,884*	*$0*	*$2,438*
Review trajectory modeling and determine daily sampling plan/locations	$0	$222	$0	$222	$0	$222	$0	$222
Analyze fluorometer and water sampling results	$0	$554	$0	$1,108	$0	$1,662	$0	$2,217
Other Equipment and Laboratory Testing	*$0*	*$25,377*	*$0*	*$47,726*	*$0*	*$92,510*	*$0*	*$159,686*
RP Monitoring Vessel	$0	$21,600	$0	$43,200	$0	$86,400	$0	$151,200
Fluorometer and Water Quality Meter (one per vessel)	$0	$835	$0	$1,584	$0	$3,168	$0	$5,544
LISST (two instruments)	$0	$2,000	$0	$2,000	$0	$2,000	$0	$2,000
Dispersant Water Column Sample Testing per Sample	$0	$942	$0	$942	$0	$942	$0	$942
Oil Distribution Analysis	$0	**$460**	$0	**$460**		**$919**	$0	**$1,379**
Characterize the boundaries of the dispersed oil.	$0	$115	$0	$115	$0	$230	$0	$345
Tailor or optimize sampling design.	$0	$115	$0	$115	$0	$230	$0	$345
Characterize the dispersant effectiveness to determine the changes in the condition of the oil due to weathering.	$0	$230	$0	$230	$0	$460	$0	$690
Ecological Characterization	**$2,660**	**$0**	**$4,433**	**$0**	**$8,866**	**$0**	**$11,083**	**$0**
Immediate Reporting	**$0**	**$120**	**$0**	**$120**	**$0**	**$120**	**$0**	**$120**
Immediate reporting of ecological receptors.	$0	$60	$0	$60	$0	$60	$0	$60
Immediately report to the OSC any deviation of more than 10 percent.	$0	$60	$0	$60	$0	$60	$0	$60
Daily Reporting	**$0**	**$300**	**$0**	**$300**	**$0**	**$300**	**$0**	**$300**
Daily reporting of sampling and data analyses	$0	$60	$0	$60	$0	$60	$0	$60
Reporting total amount of dispersant used for the previous reporting period	$0	$120	$0	$120	$0	$120	$0	$120

Information Collection Activity	Unit Cost							
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	One-Time	Per- Day	One-Time	Per-Day	One-Time	Per-Day	One-Time	Per- Day
Report the estimated daily transport of dispersed and non-dispersed oil	$0	$120	$0	$120	$0	$120	$0	$120
Total Labor Burden per Respondent per Discharge	**$4,823**	**$27,393**	**$6,597**	**$50,296**	**$11,511**	**$96,335**	**$14,689**	**$165,125**

3. Total Costs for Respondents

3.1 Information on Dispersant Application

Total estimated dispersant application cost for each model discharge scenario is calculated by multiplying the estimated hours by task by the fully-loaded labor rate for an Emergency Manager in the Oil and Gas Extraction industry. Then, per-day costs, where applicable, are estimated based on the model discharge's number of monitoring days, from Exhibit A-1.

Exhibit A-22: Total Dispersant Application Labor Burden Hours and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Document the characteristics of the source oil	$962	8	$962	8	$962	8	$1,202	10
Document dispersant choice, application method and procedures, and required equipment	$1,562	13	$4,207	13	$8,774	13	$12,019	15
Document the oil discharge flow rate and the results of any efficacy and toxicity tests	$1,442	12	$6,731	12	$15,865	12	$32,932	19
Document the discharge flow rate for volatile petroleum hydrocarbons	$0	0	$0	-	$16,105	14	$65,623	36
Total	**$3,966**	**33**	**$11,899**	**33**	**$41,706**	**47**	**$111,776**	**80**

3.2 Water Column Sampling

Total labor-related costs are calculated by multiplying the estimated hours by the fully-loaded labor rate for an Environmental Scientist in the Oil and Gas Extraction industry, and each scenario's number of monitoring days. Equipment and offsite sample testing costs are similarly estimated based on the unit costs for equipment and number of monitoring days associated with each scenario; and, for offsite sample testing, the total number of samples.

Exhibit A-23: Total Water Sampling Labor Burden Hours and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Analyze water sampling results (per day)	$554	5	$1,108	10	$1,662	15	$2,217	20
Review trajectory modeling and determine daily sampling plan/locations (per day)	$222	2	$222	2	$222	2	$222	2
Total per Day	$776	7	$1,330	12	$1,884	17	$2,438	22
Number of monitoring days	*5*		*27*		*65*		*90*	
Total	**$3,879**	**35**	**$35,909**	**324**	**$122,468**	**1,105**	**$219,445**	**1,980**

Exhibit A-24: Total Estimated Water Sampling Equipment and Testing Costs ($2019)

Equipment	Scenario 1	Scenario 2	Scenario 3	Scenario 4
SMART Tier III fluorometry vessels	$108,000	$1,166,400	$5,616,000	$13,608,000
Fluorometers & Water Meters	$4,175	$42,768	$205,920	$498,960
LISSTs	$10,000	$54,000	$130,000	$180,000
Offsite water sample testing	$23,538	$47,075	$235,375	$376,600
Total Cost	**$145,713**	**$1,310,243**	**$6,187,295**	**$14,663,560**

3.3 Oil Distribution Analyses

Total costs for oil distribution analyses are calculated by multiplying the estimated hours by the fully-loaded labor rate for an Environmental Scientist in the Management, Scientific, and Technical Consulting Services industry, and by the number of dispersant monitoring days assumed for each scenario.

Exhibit A-25: Total Oil Distribution Analysis Labor Burden Hours and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Characterize the boundaries of the dispersed oil.	$575	10	$7,470	54	$14,941	260	$31,030	540
Tailor or optimize sampling design.	$575	10	$7,470	54	$14,941	260	$31,030	540
Characterize the dispersant effectiveness to determine the changes in the condition of the oil due to weathering.	$1,149	20	$14,941	108	$29,881	520	$62,061	1,080
Total	**$2,299**	**40**	**$29,881**	**216**	**$59,762**	**1,040**	**$124,121**	**2,160**

3.4 Ecological Characterization

Total estimated ecological characterization cost are calculated by multiplying the estimated hours by the fully-loaded labor rate for an Environmental Scientist in the Oil and Gas Extraction industry.

Exhibit A-26: Total Ecological Characterization Labor Burden Hours and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Develop Ecological Characterization Study	$2,660	24	$4,433	40	$8,866	80	$11,083	100

3.5 Immediate Reporting

Total estimated immediate reporting costs for dispersant monitoring are calculated by multiplying the estimated hours by the fully-loaded labor rate for an Emergency Manager in the Oil and Gas Extraction industry, and the number of monitoring days for each scenario.

Exhibit A-27: Total Immediate Reporting Labor Burden Hours and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Immediate reporting of ecological receptors.	$300	2.5	$1,623	13.5	$3,906	32.5	$5,409	45
Immediately report to the OSC any deviation of more than 10 percent.	$300	2.5	$1,623	13.5	$3,906	32.5	$5,409	45
Total	**$601**	**5**	**$3,245**	**27**	**$7,812**	**65**	**$10,817**	**90**

3.6 Daily Reporting

Total daily reporting costs are calculated based on the number of hours per day, the fully-loaded labor rate for an Emergency Manager in the Oil and Gas Extraction industry, and the number of monitoring days for each scenario.

Exhibit A-28: Total Daily Reporting Labor Burden and Cost ($2019)

Labor Requirement	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours
Daily reporting of sampling and data analyses	$300	2.5	$1,623	13.5	$3,906	32.5	$5,409	45
Reporting total amount of dispersant used for the previous reporting period	$601	5.0	$3,245	27	$7,812	65	$10,817	90
Report the estimated daily transport of dispersed and non-dispersed oil	$601	5.0	$3,245	27	$7,812	65	$10,817	90
Total	**$1,502**	**12.5**	**$8,113**	**67.5**	**$19,531**	**162.5**	**$27,043**	**225**

3.7 Total Respondent Cost

Exhibit A-29 summarizes the total labor burden and cost per respondent, per discharge scenario. Total costs are disaggregated for labor, O&M, and equipment costs. Costs range from $160,000 in Scenario 1 to $15 million in Scenario 4 (i.e., Scenario 4 costs exceed Scenario 1 costs by a factor of approximately 100x). EPA estimates costs of $1.4 million and $6.4 million for Scenarios 2 and 3, respectively.[15]

Exhibit A-29: Total Estimated Respondent Labor Burden and Cost, by Discharge Scenario ($2019)

Rule Requirement	Labor		O&M	Equipment
	Hours	Cost		
Scenario 1				
1. Information on Dispersant Application	33	$3,966	$0	$0
2. Water Column Sampling				
Sampling Equipment	0	$0	$0	$122,175
Sample Testing	0	$0	$23,538	0

[15] For reference, EPA's 2015 NPRM assumed a single representative value of $500,000 per spill. In public comments submitted in response to the NPRM, the American Petroleum Institute (API) and the National Ocean Industries Association (NOIA) provided an estimate for a single scenario, with a cost of $850,000. The API/NOIA's analysis was based on a spill with a 21-day active monitoring period and is closest in concept to Scenario 2 in this RIA, for which EPA estimates costs of $1.4 million.

Rule Requirement	Labor		O&M	Equipment
	Hours	Cost		
Sampling Labor Costs	35	$3,879	$0	0
3. Oil Distribution Analysis	40	$2,299	$0	0
4. Ecological Characterization	24	$2,660	$0	0
5. Immediate Reporting	5	$601	$0	0
6. Daily Reporting	12.5	$1,502	$0	0
Total Costs by Type	*150*	*$14,907*	*$23,538*	*$122,175*
Total Scenario Cost				**$160,620**
Total Scenario Labor Burden Hours				**150**
Scenario 2				
1. Information on Dispersant Application	33	$11,899	$0	$0
2. Water Column Sampling				
Sampling Equipment	0	$0	$0	$1,263,168
Sample Testing	0	$0	$47,075	0
Sampling Labor Costs	324	$35,909	$0	0
3. Oil Distribution Analysis	216	$12,412	$0	0
4. Ecological Characterization	40	$4,433	$0	0
5. Immediate Reporting	27	$3,245	$0	0
6. Daily Reporting	67.5	$8,113	$0	0
Total Costs by Type	*708*	*$76,011*	*$47,075*	*$1,263,168*
Total Scenario Cost				**$1,386,254**
Total Scenario Labor Burden Hours				**708**
Scenario 3				
1. Information on Dispersant Application	47	$41,706	$0	$0
2. Water Column Sampling				
Sampling Equipment	0	$0	$0	$5,951,920
Sample Testing	0	$0	$235,375	0
Sampling Labor Costs	1105	$122,468	$0	0
3. Oil Distribution Analysis	1,040	$59,762	$0	0
4. Ecological Characterization	80	$8,866	$0	0
5. Immediate Reporting	65	$7,812	$0	0
6. Daily Reporting	162.5	$19,531	$0	0
Total Costs by Type	*2,500*	*$260,146*	*$235,375*	*$5,951,920*
Total Scenario Cost				**$6,447,441**
Total Scenario Labor Burden Hours				**2,500**
Scenario 4				
1. Information on Dispersant Application	80	$111,776	$0	$0
2. Water Column Sampling				
Sampling Equipment	0	$0	$0	$14,286,960
Sample Testing	0	$0	$376,600	0
Sampling Labor Costs	1980	$219,445	$0	0

Rule Requirement	Labor		O&M	Equipment
	Hours	Cost		
3. Oil Distribution Analysis	2,160	$124,121	$0	0
4. Ecological Characterization	100	$11,083	$0	0
5. Immediate Reporting	90	$10,817	$0	0
6. Daily Reporting	225	$27,043	$0	0
Total Costs by Type	*4,635*	*$504,285*	*$376,600*	*$14,286,960*
Total Scenario Cost				**$15,167,845**
Total Scenario Labor Burden Hours				**4,635**

Given a 0.2 probability of an applicable incident in any given year, based on EPA's analysis of historical discharges, Exhibit A-30 presents the annual expected value for labor burden and cost for respondents. Estimated annualized costs range from $32,000 per year for Scenario 1 to $3.0 million per year for Scenario 4.

Exhibit A-30: Annual and Three-Year Labor Burden and Cost for Respondents ($2019)

	Scenario			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Annual Number of Respondents and Responses	0.2	0.2	0.2	0.2
Annual Burden (hours)	30	142	500	927
Annual Cost	$32,124	$277,251	$1,289,488	$3,033,569
Three-Year Total Number of Respondents and Responses	0.6	0.6	0.6	0.6
Three-Year Total Burden (hours)	90	425	1,500	2,781
Three-Year Total Cost	$96,372	$831,753	$3,868,464	$9,100,707