Facility Response Plan Overview & Applicability

EPA FRP Course, Module 1
WITT O'BRIENS Compliance Workshop
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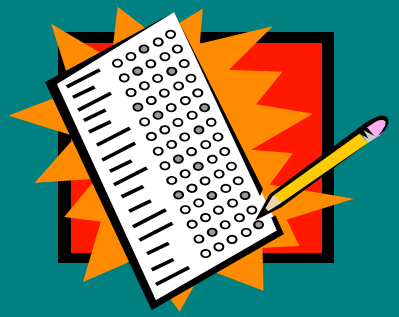
EPA Office of Emergency Management

Legal Disclaimer

This presentation is meant to provide an overview to EPA inspectors, owners and operators of regulated facilities, and the general public on the implementation of the 40 CFR Part 112. This presentation seeks to promote nationally-consistent implementation of the FRP rule. The statutory provisions and EPA regulations described in this presentation contain legally binding requirements. This presentation does not substitute for those provisions or regulations, nor is it a regulation itself. In the event of a conflict between the discussion in this presentation and any statute or regulation, the statute and/or regulation is controlling. This presentation does not impose legally binding requirements on EPA or the regulated community, and might not apply to a particular situation based upon the circumstances. The word "should" as used in this presentation is intended solely to recommend or suggest an action, and is not intended to be viewed as controlling. Examples in this presentation are provided as suggestions and illustrations only. While this presentation indicates possible approaches to assure effective implementation of the applicable statute and regulations, EPA retains the discretion to adopt approaches on a case-by-case basis that differ from this presentation where appropriate. Any decisions regarding compliance at a particular facility will be made based on the application of the statute and regulations. References or links to information cited throughout this presentation are subject to change. Rule provisions and internet addresses provided in this guidance are current as of October 2019. This presentation may be revised periodically without public notice.



Course Objectives

- Overview of Facility Response Plan (FRP) rule
- FRP Applicability and Plan Elements
- Appendix C of 40 CFR 112
  - FRP planning distance calculations
  - Use of the planning distance to determine:
    - FRP applicability
    - Hazard evaluation
    - Response resources and strategies

Module Topics

I. Module Introduction
   - History of regulation

II. FRP Applicability
   - Overview of FRP applicability
   - Role of planning distance in determining applicability

III. Planning Distance Calculation
   - Types of planning distances to be considered
   - Transport of oil on water bodies
   - Transport of oil over land

IV. How Else is the Planning Distance Used?

Regulatory History and FRP Rule Overview

- Oil Pollution Act of 1990: Congress amends *§311(j)(5)* of the Clean Water Act (CWA)
  - "The President shall issue regulations which require an owner or operator of a tank vessel or facility […] to prepare and submit to the President a plan for responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge, of oil or a hazardous substance."
- February 17, 1993: U.S. Environmental Protection Agency (EPA) proposes amendments to *40 CFR part 112* to require FRPs

Regulatory History

- July 1, 1994: Final Rule published in the *Federal Register.*
- October 20, 1997: EPA denies a petition to amend the FRP rule for animal fats and vegetable oils (AFVOs).
- June 30, 2000: EPA promulgates a Final Rule amending FRP requirements for facilities that handle, store or transport AFVOs.
  - Establishes different factors calculating on-water and onshore recovery capabilities for worst case discharge of AFVOs

FRP Rule Outline – Subpart D of Part 112

- §112.20
  - Applicability
    - Self-determination by owner/operator *[§112.20(a)]*
    - Determination by EPA Regional Administrator (RA) *[§112.20(b)]*
  - Categories of FRP facilities
    - Substantial harm *[§§112.20(f)(1-2), Appendix C, Attachment C-1]*
    - Significant and substantial harm *[§112.20(f)(3)]*
  - Planning requirements and FRP format, including Emergency Response Action Plan (ERAP) *[§§112.20(g) and (h)]*

FRP Rule Outline – Subpart D of Part 112 *(Continued)*

- §112.20 *(continued)*
  - Plan review *[§§112.20(b),(c), and (d)]*
  - Appeals of EPA RA determination *[§112.20(i)]*
- §112.21
  - Facility response personnel training *[§§112.21(a) and (b)]*
  - Drills/exercises *[§112.21(c)]*

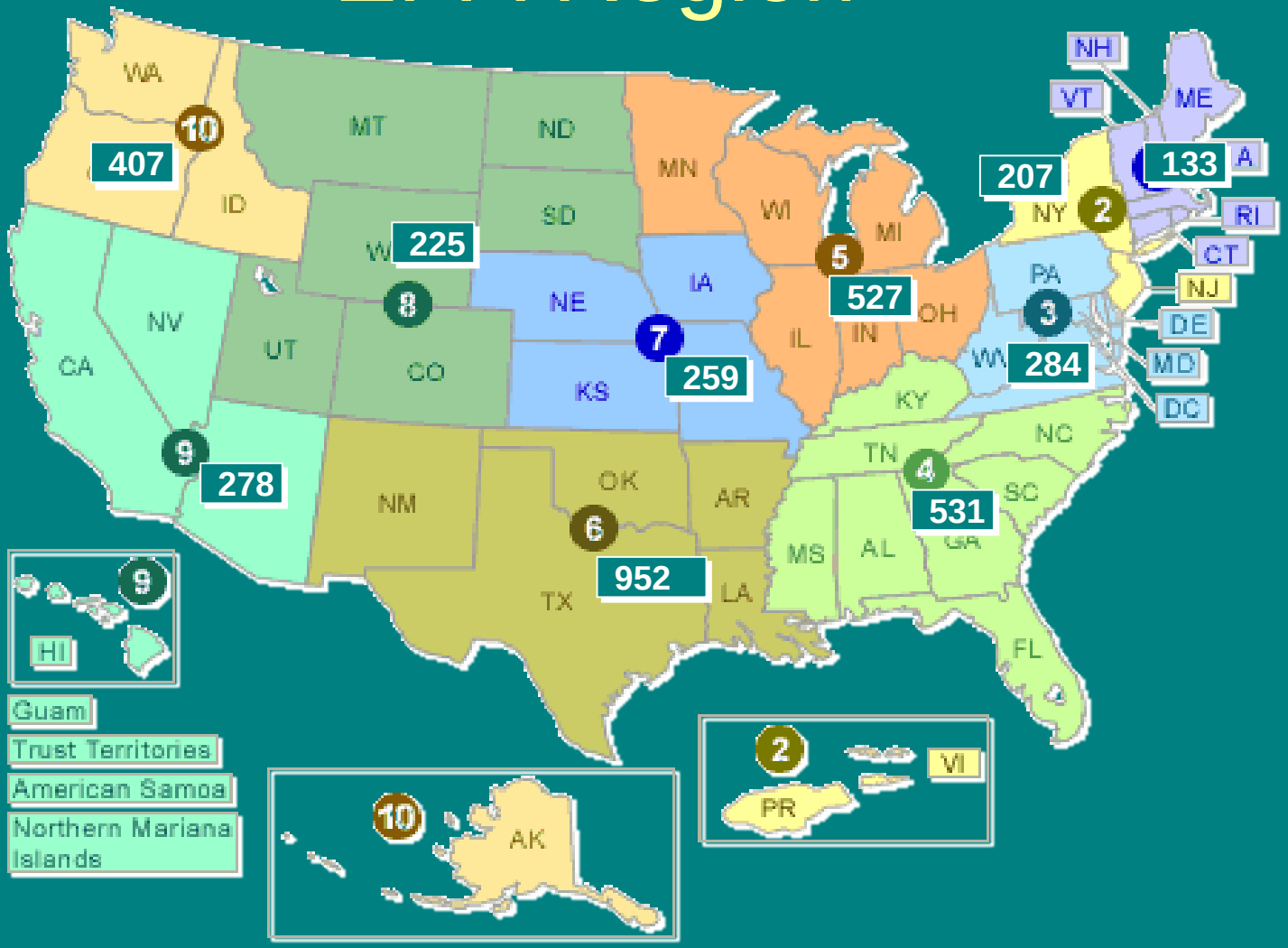
FRP-Specific Appendices

- C – Substantial Harm Criteria
  - Applicability criteria flowchart (Attachment C-I)
  - Template for certification form (Attachment C-II)
  - Procedures for calculation of planning distance (including oil transport on moving water, still water or tidal waters, and overland transport)
- D – Worst Case Discharge Planning Volume
  - Onshore storage or production facilities with single or multiple tanks
- E – Required Response Resources for FRPs
  - Consideration given for oil group (petroleum, AFVOs, etc.) and operating environment (rivers and canals, inland, Great Lakes, oceans)
- F – Model Facility Specific Response Plan

National Universe of FRP Facilities

- Information contained in national FRP/SPCC program database
- Current count: ~3,803 FRP plan holders
- Largest concentration: Region 6 with over 950, or about 25%

Number of FRP Facilities by EPA Region



Current Count : **3,803** FRP Plan holders

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   - Transport of oil over land

IV. How Else is the Planning Distance Used?

Review of FRP Applicability

- FRPs are required for a subset of Spill Prevention, Control and Countermeasure (SPCC) facilities that could, because of their location, cause substantial harm to the environment by discharging oil.
- FRP facilities are identified in two ways:
  - Self-identification process
  - Determination of the Regional Administrator (RA)
- All SPCC facilities must fill out and maintain the FRP applicability determination form
  - Attachment C-II

Storage Capacity

- The total storage capacity considered for the purpose of determining applicability of the FRP rule requirements is the same as that reported in the facility's SPCC Plan.
- The total storage capacity is the SPCC storage capacity which includes bulk storage containers plus oil-filled equipment (operational, manufacturing, electrical equipment).

  [40 CFR 112.1(ii) and 112.2]

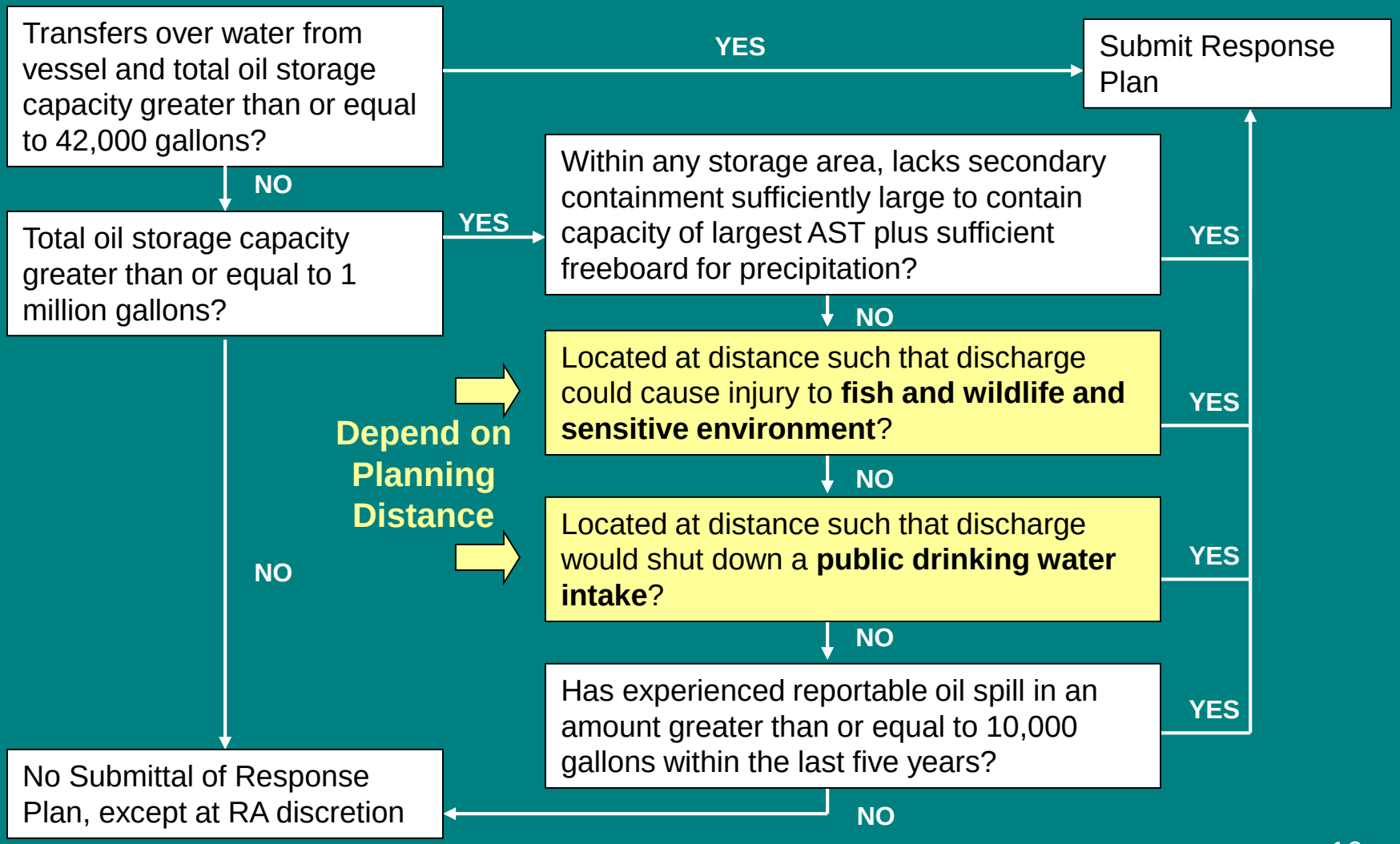
Substantial Harm Criteria: *Facility Owner/Operator Determination*

The owner/operator must determine whether the facility meets the substantial harm criteria outlined in §112.20(f)(1):

- Total storage capacity of 42,000 gallons or greater and conducts over-water transfers of oil to/from vessels or
- Total storage capacity of 1 million gallons or greater and at least one of the following:
  - Lacks adequate secondary containment for any aboveground storage area
  - Oil discharge could cause injury to fish and wildlife and sensitive environments, including cooling water intakes and irrigation intakes
  - Oil discharge could shut down a public drinking water intake
  - Experienced reportable oil discharge of 10,000 gallons or more in the last 5 years

§112.20(f)(1)

Substantial Harm Criteria



Appendix C, Attachment C-1

Substantial Harm Criteria: EPA RA Determination

- Owner/operator applied self-identification criteria improperly
- Owner/operator applied self-identification criteria properly, but RA still believes the facility poses the risk of substantial harm based on criteria in §112.20(f)(2):
  - Type of transfer operation
  - Oil storage capacity
  - Lack of secondary containment
  - Proximity to fish and wildlife and sensitive environments and other areas determined by the RA to possess ecological value
  - Proximity to drinking water intakes
  - Spill history
  - Other site-specific characteristics and environmental factors that the RA determines to be relevant

§112.20(f)(2)

Substantial Harm Criteria: EPA RA Determination *(continued)*

- These factors are similar to the criteria the owners/operators consider in the self-identification process
- Difference: RA determination criteria do not have specific thresholds
- RA has additional flexibility to consider other site-specific characteristics and environmental factors

Substantial Harm Criteria: EPA RA Determination *(continued)*

- The EPA RA may at any time require the owner/operator of any facility to prepare and submit an FRP. *[§112.20(b)(1)]*
- Any person may petition the EPA RA to determine whether a facility meets substantial harm criteria. The petition should discuss how the facility meets the substantial harm criteria. *[§112.20(f)(2)(ii)]*

Certification Form (Attachment C-II)

- If the owner/operator determines that the facility could not, because of its location, reasonably be expected to cause substantial harm, he/she must complete and maintain the certification form contained in Appendix C *[§112.20(e)]*
- If an alternative formula is used to evaluate FRP applicability criteria, documentation must be attached to the certification form, and the owner/operator must notify the EPA RA that an alternative formula was used *[§§112.20(e) and 112.20(a)(3)]*
- All facilities with an SPCC Plan should maintain a copy of the FRP certification form at the facility, unless the facility has prepared an FRP

APPLICABILITY OF SUBSTANTIAL HARM CRITERIA

Does the facility transfer oil over-water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes No X

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

Yes No X

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes X No

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes No X

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes No X

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Dave Foulke
TT&M HES&S Manager

6/9/2008
Date

FRP Submission and Review Process

- Owners and operators of substantial harm facilities must prepare and submit an FRP to the EPA RA *[§112.20(a)]*
- EPA RA reviews the FRP *[§112.20(b)(2)]*
- If facility is determined to have the potential to cause "significant and substantial harm"…
  - EPA RA notifies the facility in writing *[§112.20(c)]*
  - EPA RA reviews and approves the Plan (after requesting amendments to the Plan if necessary, to meet the rule requirements) *[§§112.20(c)(2) and (c)(3)]*
  - EPA RA reviews Plan periodically thereafter – at least once every 5 years *[§112.20(c)(4)]*

FRP Submission Deadlines

Facility Type *IF…*	**Existing facility** (in operation on or before August 30, 1994)	**New facility** (commences operation after August 30 1994)	Becomes subject to requirements as a result of **planned** change in design, construction or maintenance	Becomes subject to requirements as a result of **unplanned** event or change in facility characteristics	Becomes subject to requirements as a result of **EPA RA** determination
…THEN:					
Deadline for submitting FRP and Cover Sheet to RA	Should have already submitted a Plan	Prior to the start of operations	**Before** the portion of the facility undergoing changes commences operations	Within **6 months** of the unplanned event or change	Within **6 months** of receiving written notification from the EPA RA
Rule Citation	112.20(a)(1)	112.20(a)(2)(ii)	112.20(a)(2)(iii)	112.20(a)(2)(iv)	112.20(b)(1)

Harm Determinations

A More Detailed Look

Substantial Harm Evaluation

Does the facility have a total storage capacity of 42,000 gallons or greater and transfer oil over water to/from vessels?

- Examples of activities that constitute transfers of oil over water to and from vessels include:
  - An oil tanker (vessel) transferring crude oil to bulk storage at a refinery
  - A vessel transferring fuel to bulk storage at a pipeline facility for further distribution
  - A bulk storage facility transferring vegetable oil to a barge

Substantial Harm Evaluation

(continued)

Does the facility have an aboveground storage capacity of 1 million gallons or greater?

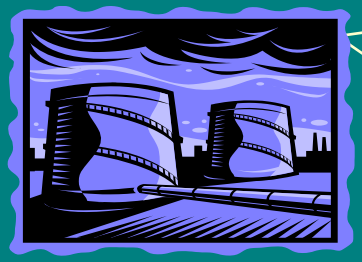
1. Evaluate secondary containment
   - Is it adequate for all aboveground oil storage areas? May need to check certified SPCC plan
   - Containment capacity must be at least that of the "largest aboveground oil storage tank within each storage area plus sufficient freeboard for precipitation"
   - Review discharge history
     - Has the facility experienced a discharge of 10,000 gallons or more in the last 5 years?

Substantial Harm Evaluation
(continued)

2. Perform calculations using the distance formula to determine planning distance
   - See 40 CFR part 112, Appendix C, Attachment C-III
3. Evaluate potential to cause injury to fish and wildlife and sensitive environments and/or to shut down a drinking water intake
   - Are there fish and wildlife areas, sensitive environments or drinking water intakes identified in the relevant Area Contingency Plan(s) within the calculated planning distance?

Planning Distance

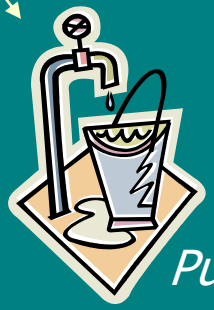
- Distance downstream from point of discharge at the facility within which potential points of impact or injury under adverse weather conditions (Figure C-1) could be located
- Distance is a function of facility location and the time interval for the arrival and deployment of response resources (specified in Table 3, Appendix C)
- Used for screening purposes



Facility nearest opportunity for discharge

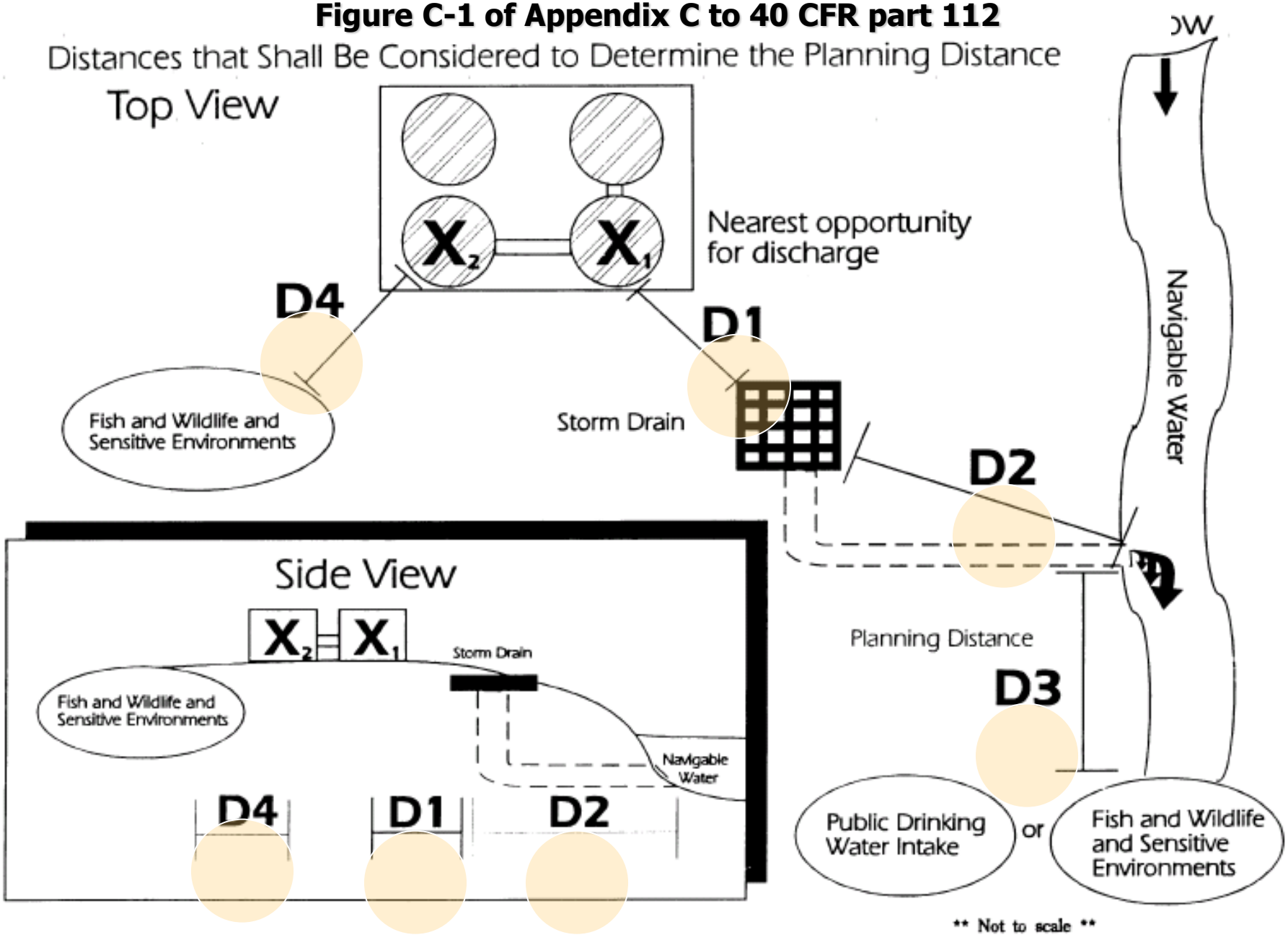
Nearby storm drains to navigable waters

Fish and wildlife and sensitive environments



Public water intakes

Figure C-1 of Appendix C to 40 CFR part 112



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IV. How Else is the Planning Distance Used?

Planning Times

- Specified response time intervals are for planning purposes and applicability determination
- Pre-planning and deployment of response resources do not affect these planning assumptions - *assume no prior spill preparedness planning*

Specified Time Interval by Facility Operating Area

[Appendix C, Table 3]

Operating Area	Geographical Scope	Specified Response Time Interval*
Higher Volume Port Areas	Boston, MA; New York, NY; Delaware Bay and River to Philadelphia, PA; St. Croix, VI; Pascagoula, MS; Mississippi River from Southwest Pass, LA to Baton Rouge, LA; Louisiana Offshore Oil Port (LOOP), LA; Lake Charles, LA; Sabine-Neches River, TX; Galveston Bay and Houston Ship Channel, TX; Corpus Christi, TX; Los Angeles/Long Beach Harbor, CA; San Francisco Bay, San Pablo Bay, Carquinez Strait, and Suisun Bay to Antioch, CA; Straits of Juan de Fuca from Fort Angeles, WA to and including Puget Sound, WA; Prince William Sound, AK; and Others as specified by the EPA RA for any EPA Region.	12hr arrival time + 3hr deployment time = **15 hours**
Great Lakes	Lakes Superior, Michigan, Huron, Erie, and Ontario, their connecting and tributary waters, the Saint Lawrence River as far as Saint Regis, and adjacent port areas.	24hr arrival time + 3hr deployment time = **27 hours**
All other rivers and canals, inland, and nearshore areas		24hr arrival time + 3hr deployment time = **27 hours**

**Specified time interval includes 3 hours for deployment of response resources.*

Planning Distance Formulas

- Purpose: Determine the distance discharged oil will travel or spread on water within which fish, wildlife and sensitive environments could be injured or operations at a public drinking water intakes could be disrupted
- Attachment C-III (Appendix C) addresses four transport mechanisms:
  - Moving navigable waters
  - Still water
  - Tidal-influence areas
  - Over land

§112.20(a)(3), Attachment C-III, Sec. 1.2

Transport Mechanisms

- Moving navigable waters
  - Assumes the oil will be transported at the surface of the water by the water current
  - Calculation is a function of velocity of moving navigable water and time for response resources to arrive
- Still water
  - Assumes oil will spread in a semi-circle from the discharge point over the surface
- Tidal-influence areas
  - Calculation is based on type of oil (non-persistent oils vs. persistent oils) and distance during both ebb and flood tides
- Over land
  - Calculate velocities for open concrete channels and storm drains
  - Oil transport usually considered instantaneous

§112.20(a)(3), Attachment C-III,

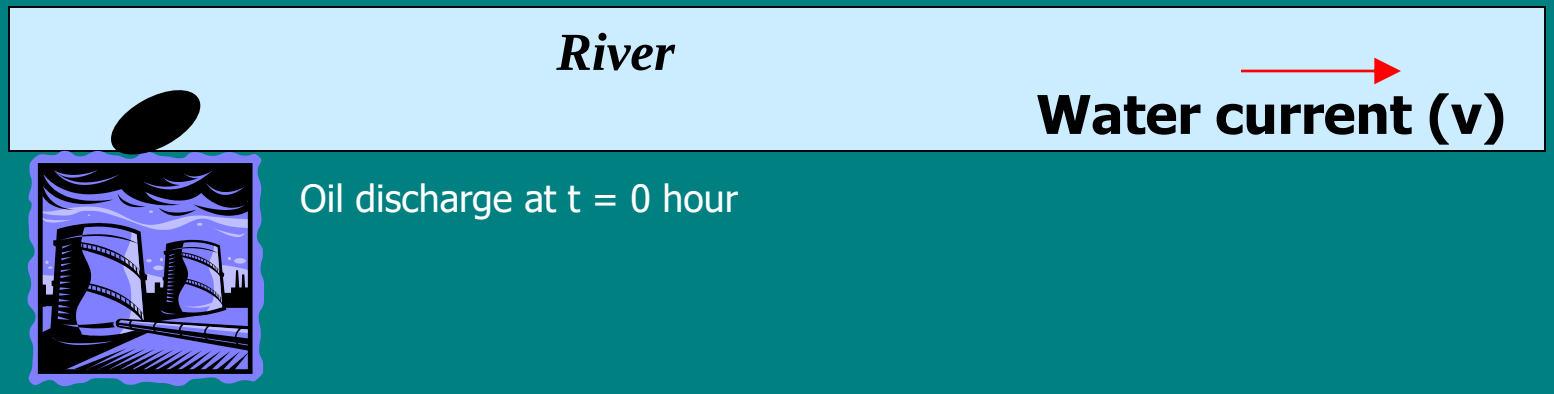
Planning Distance Formulas
(continued)

- EPA's formulas were designed to be simple to use, however, owner/operator may use alternate formula to calculate planning distance; if so, he/she must:
  - Attach documentation to the response Plan cover sheet that demonstrates reliability and analytical soundness of the alternative formula
    - Formula needs to be comparable to one contained in Appendix C
  - Must notify the RA in writing that an alternative formula was used

Oil Transport on Moving Navigable Waters

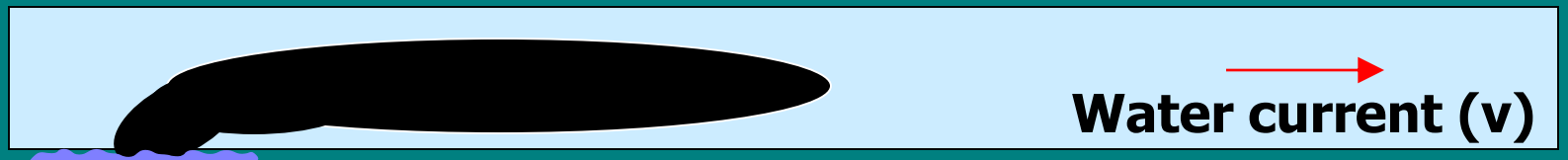
- *D* **=** *v* ***x*** *t* ***x*** *c*
- *D:* Distance (miles) downstream that oil could travel before being contained
- *V:* Average surface velocity (ft/sec) of the water
  - Based on measured velocities (e.g., USGS data), **OR**
  - Calculated using the Chezy-Manning equation based on mid-channel depth and roughness coefficient (v=1.5/n x r2/3 x s1/2)
- *T:* Time interval (hours) for response actions
- *C:* Constant conversion factor = 0.68 sec-mile/hr-ft

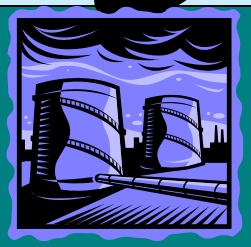
Oil Transport on Moving Navigable Waters *(continued)*



Location is high volume port area
Table 3
Arrival time: 12 hours
Deployment time: 3 hours

Oil Transport on Moving Navigable Waters *(continued)*

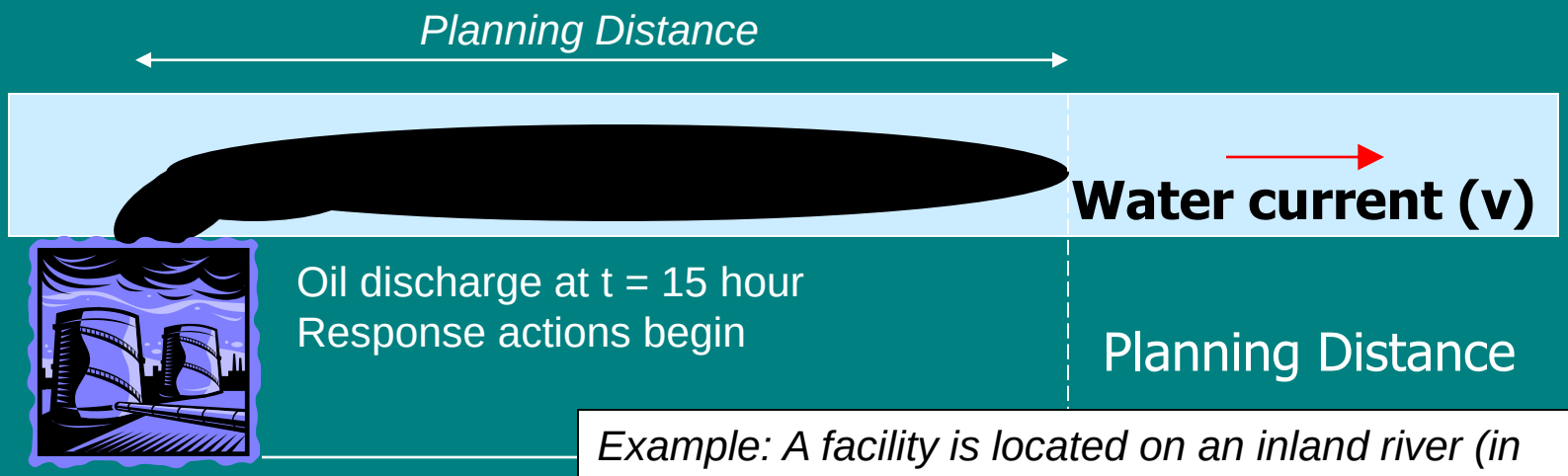




Facility

Oil discharge at t = 12 hour
Response resources arrive on site

Oil Transport on Moving Navigable Waters *(continued)*



Example: A facility is located on an inland river (in high-volume port area) with an average surface velocity of 2 ft/sec.

1. What is the planning distance for this facility?

D = 2 ft/sec x 15 hr x 0.68 sec-mile/hr-ft = **20.4 miles**

2. What resources are within the planning distance?

Oil Transport on Still Waters

Lake

Wind

Oil discharge at t = 0 hour

Location is not in high volume port area

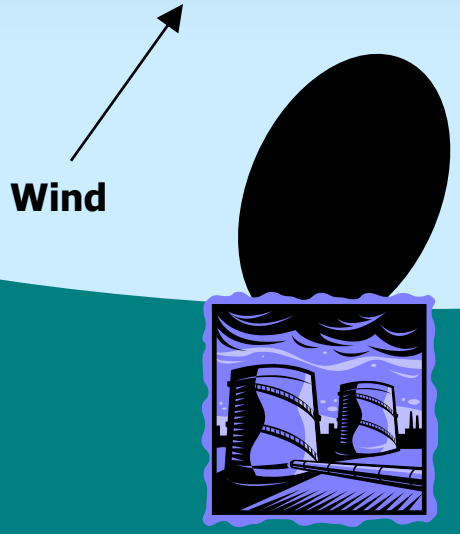
Table 3

Arrival time: 24 hours

Deployment time: 3 hours

Oil Transport on Still Waters

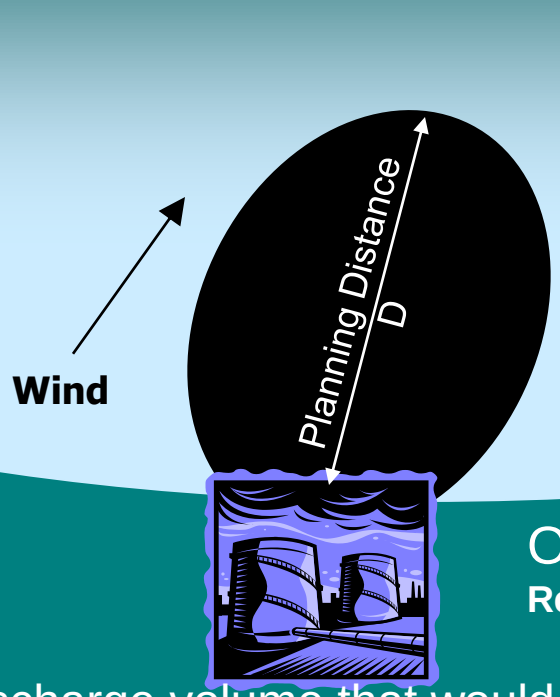
Lake



Oil discharge at t = 24 hours

Response resources arrive on site

Oil Transport on Still Waters



Oil discharge at t = 27 hours

Response actions begin

V is the worst case discharge volume that would be spilled
v is the wind velocity that would push the oil
t is the planning time (27 hours)
A is the surface area covered by oil (represented by the black circle)
D is the distance that oil travels over water

Oil Transport on Still Waters

$$D = \sqrt{\left(\frac{2A}{\pi}\right)} + (0.03)v \times t$$

$$A = 10^5 V^{3/4} c$$

D = distance (radius of oil spread + wind effect)
A = surface area covered by oil (square feet)
v = wind velocity (use 3% factor)
t = time interval for arrival and deployment of response resources
V = volume of oil spilled (gallons)
c = constant conversion factor of 0.1643 ft^2/gallon

Oil Transport on Still Waters *(continued)*

1. Estimate spread on water in semi-circular shape:

Calculate on water Area (A, in ft^2) of oil from Volume (V, gal):

$$A = 10^5 \, V^{3/4} \times c$$

Constant conversion factor (c) is 0.1643 ft^2/gal

Calculate radius of semicircular spread area:

$$r = (2A \div \pi)^{1/2} = (2A \div \pi)^{1/2}/5{,}280$$

[feet] [miles]

Oil Transport on Still Waters *(continued)*

2. Next include spread by sustained wind

Assume oil slick moves at 3% of wind speed (*v*), in mi/hr (App. C reference: *Oil Spill Prevention & Control*. National Spill School, Corpus Christi State Univ., 13th Edition, May 1990.

Distance of transport by wind (d), in miles:

$$d = (0.03) \times v \times t$$

't' is time interval for arrival and deployment of response resources, 15 or 27 hrs

Oil Transport on Still Waters *(continued)*

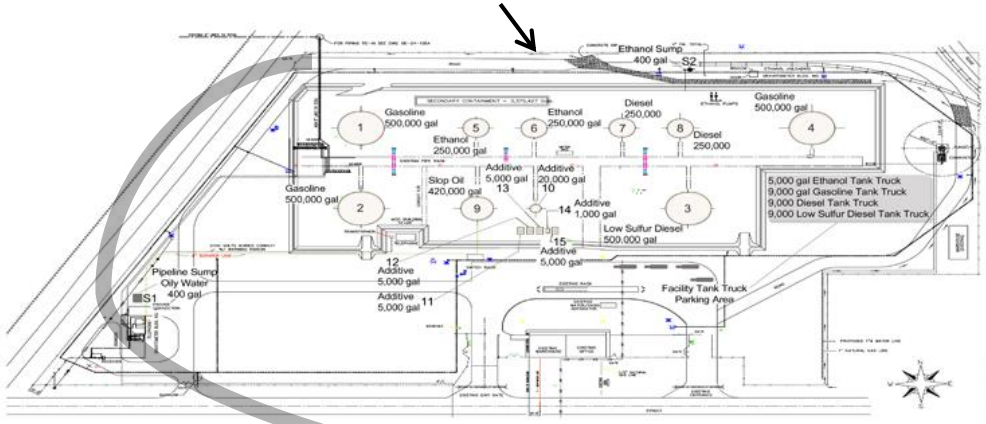
3. Combine spreading distance with wind movement to estimate total planning distance

   d = spreading distance + wind-influenced distance

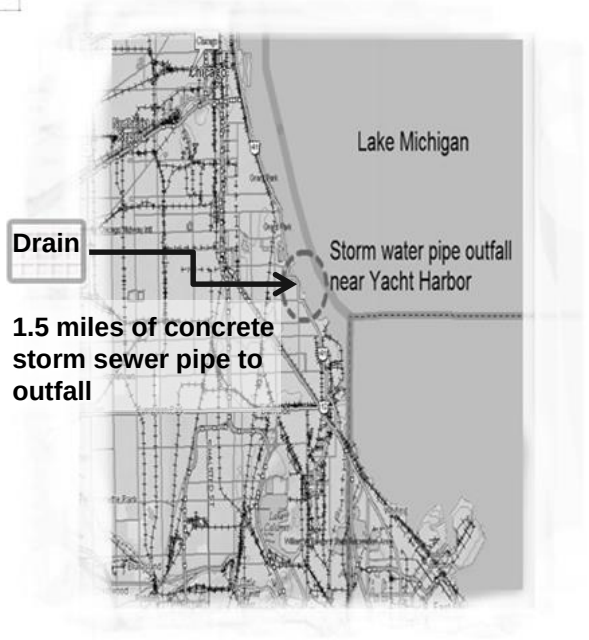
   't' is time interval for arrival and deployment of response resources, 15 or 27 hrs

FRP Applicability - Planning Distance for Still Waters

North storm water open concrete drainage channel



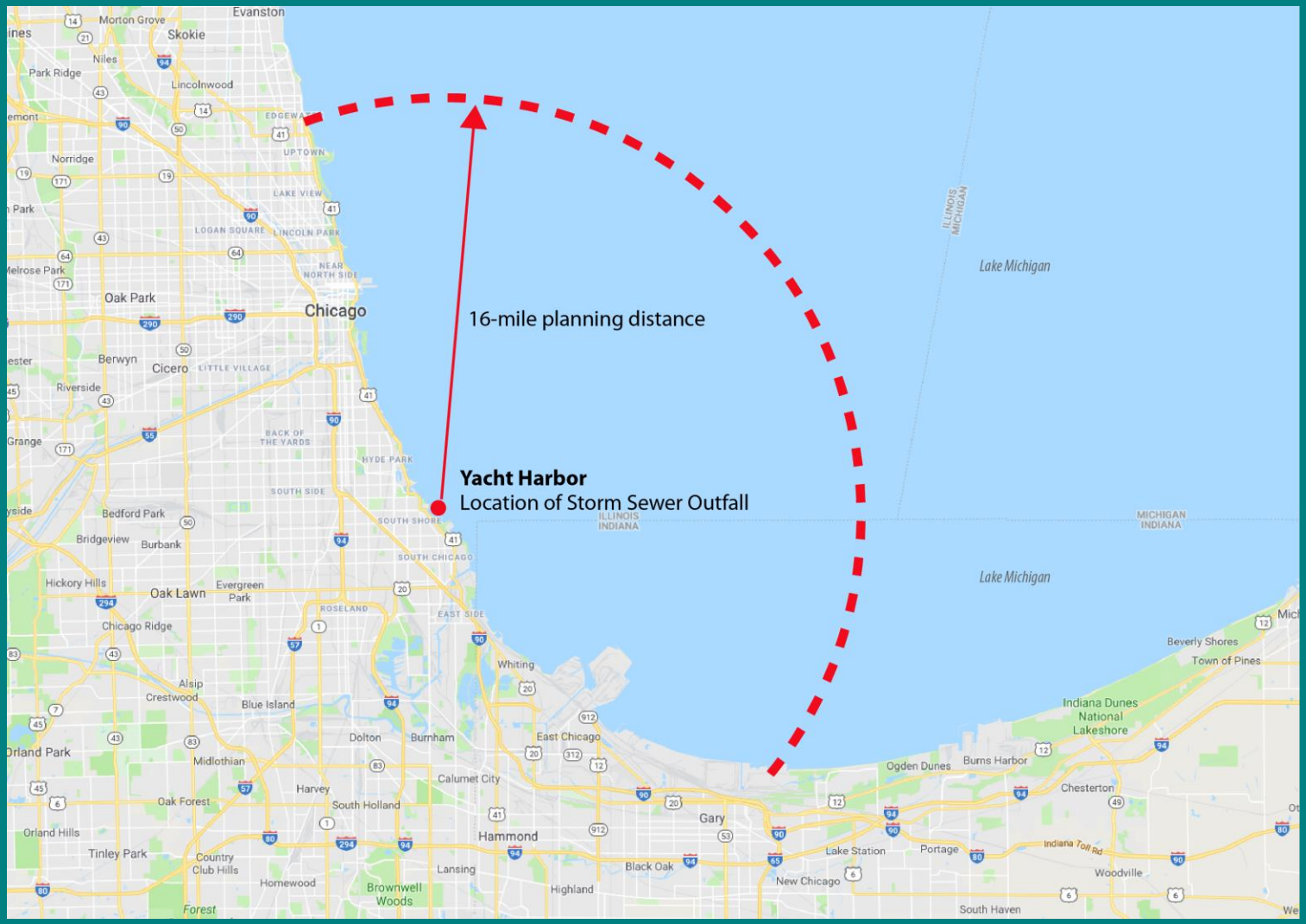
Facility Location in Industrial Area in Metropolitan Chicago



Spill entering the north storm water open drainage channel travels 0.5 miles along the channel, enters a main open concrete storm water drainage channel, and then discharges into a concrete storm sewer drain located 0.5 miles downstream in the drainage channel

1.5 miles of concrete storm sewer pipe to outfall

FRP Applicability - Planning Distance for Still Water (continued)



Transport of Oil on Tidal-Influence Areas

- Largely depends on the type of oil:
  - Persistent oil
    - 15 miles down current, during ebb tide
    - 15 miles (or maximum tidal influence, if less) during flood tide
  - Non-persistent oil
    - 5 miles down current, during ebb tide
    - 5 miles (or maximum tidal influence, if less) during flood tide

Transport of Oil on Tidal-Influence Areas *(continued)*

Non-persistent oils (Group 1 oils) can be either petroleum-based oil or non-petroleum oil *[Appendix E, Section 1.2.3]*:

- Petroleum-based oil consists of hydrocarbon fractions:
  - At least 50% by volume distill at 645 °F (340 °C)
  - At least 95% by volume distill at 700 °F (370 °C)
- Non-petroleum oil, other than AFVO, has a specific gravity < 0.8
- Examples: Gasoline, light diesel and kerosene

Transport of Oil on Tidal-Influence Areas *(continued)*

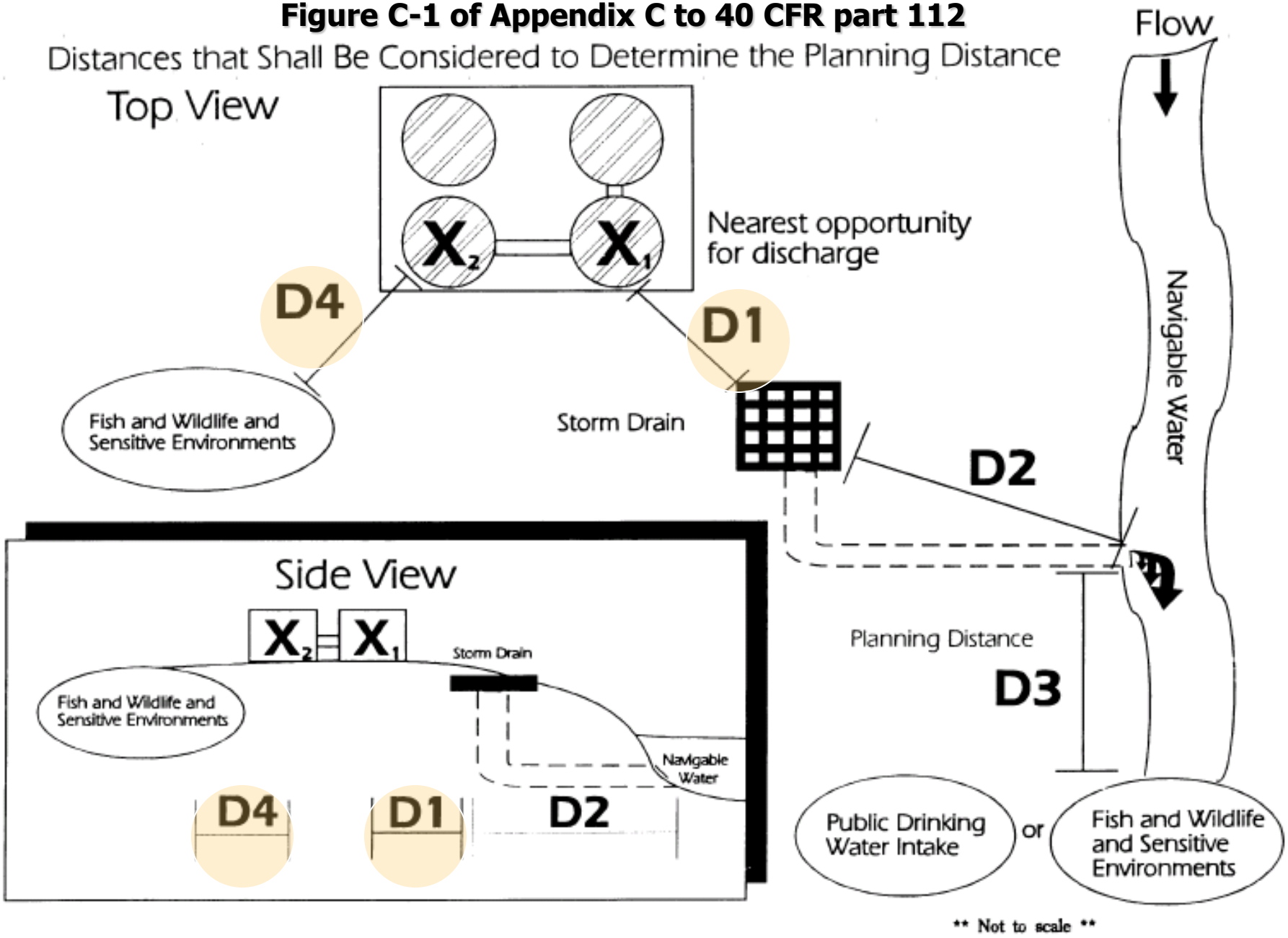
Persistent oil (Groups 2, 3, 4 and 5) are *[Appendix E, Section 1.2.8]*:

- Petroleum-based oils that do not meet the distillation criteria for non-persistent oil; further classified based on specific gravity
- Non-petroleum oil, other than AFVO, with a specific gravity greater than 0.8; further classified based on specific gravity
- Examples: Crude oils, fuel oils, heavy diesel and lubricating oil

Transport of Oil on Tidal-Influence Areas *(continued)*

- In certain situations, it is possible for oil to impact two types of navigable water conditions *[Appendix C, Section 4.3]*: moving water and tidal water. When these conditions occur, the planning distance will be the greater of the two distances that are calculated for the two different water conditions.
- For example, as explained in Section 4.3 of App. C, facility storing persistent oil, located downstream from locks along slow-moving river.
- Calculated PD = 9.18 miles
- PD for max tidal influence during ebb tide = 15 miles
- So PD = 15 miles is appropriate for facility.

Figure C-1 of Appendix C to 40 CFR part 112



Transport of Oil Over Land

[Appendix c, Section 5.0]

- In addition to transportation over water, facility owners and operators must also evaluate the potential for oil to impact sensitive resources through oil transport over land not bordering a navigable water (D4 pathway).

- When considering oil transport over land, navigable waters are considered a sensitive resource, as are fish, wildlife and other sensitive resources and environments.

- The purpose of computing oil transport over land is to determine if any portion of a worst case discharge can reach navigable waters or any other sensitive resource.

Transport of Oil Over Land

(continued)

- Free oil can potentially reach navigable waters or other sensitive resources through open channel flow, such as storm drains or other open concrete channels, and/or through sheet flow across land
- Appendix C, Section 5.2, assumes that free oil that reaches the inlet of a storm drain or open concrete channel designed for the purposes of drainage will also reach navigable waters in a negligible amount of time
- Appendix C, Sections 5.4 – 5.7, specify certain distances from spill sources that shall be considered (D1, D2, D3, and D4).

Transport of Oil Over Land

(continued)

- Commentary: Facility owner/operators should review the language in Section 5.1: The owner or operator must evaluate the likelihood that portions of a WCD would reach navigable waters via open channel flow or from sheet flow across land, or be prevented from reaching navigable waters when trapped in natural or man-made depressions, *excluding secondary containment structures.*
- But then need to consider the language in Section 5.5: A facility owner or operator whose nearest opportunity for discharge is located within ½ mile of a navigable water must complete the planning distance calculation (D3) for the type of navigable water near the facility or use a comparable formula.

Transport of Oil Over Land

Potential Over Land Pathways to Navigable Waters

So we have the planning distance…what's next?

Module Agenda

I. Module Introduction
   - History of regulation

II. FRP Applicability
   - Overview of FRP applicability
   - Role of planning distance in determining applicability

III. Planning Distance Calculation
   - Types of planning distances to be considered
   - Transport of oil on water bodies
   - Transport of oil over land

IV. How Else is the Planning Distance Used?

FRP Format

[§112.20(h) and Appendix F]

PLAN SECTION	
1	Emergency Response Action Plan (ERAP)
2	Facility Information
3	Information about Emergency Response
4	Hazard Evaluation
5	Discharge Scenarios (Response Planning Levels)
6	Discharge Detection Systems
7	Plan Implementation
8	Self-Inspection, Drills/Exercises, and Response Training
9	Diagrams
10	Security Systems
11	Response Plan Cover Sheet

Questions?

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