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IBRD Operational Decision Framework

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Auspices Statement

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Preface

The IBRD Operational Decision Framework in this document is an expansion of an emerging general risk management framework under development by an interagency working group. It provides the level of detail necessary to develop a general **Consequence Management Guidance Document** for biological contamination remediation and restoration. It is the intent of this document to support both wide area and individual site remediation and restoration activities.

This product was initiated as a portion of the IBRD Task 1 Systems Analysis to aid in identification of wide area remediation and restoration shortcomings and gaps. The draft interagency general risk management framework was used as the basis for the analysis. The initial Task 1 analysis document expanded the draft interagency framework to a higher level of resolution, building on both the logic structure and the accompanying text explanations. It was then employed in a qualitative manner to identify responsible agencies, data requirements, tool requirements, and current capabilities for each decision and task. This resulted in identifying shortcomings and gaps needing resolution. Several meetings of a joint LLNL/SNL working group reviewed and approved the initial content of this analysis.

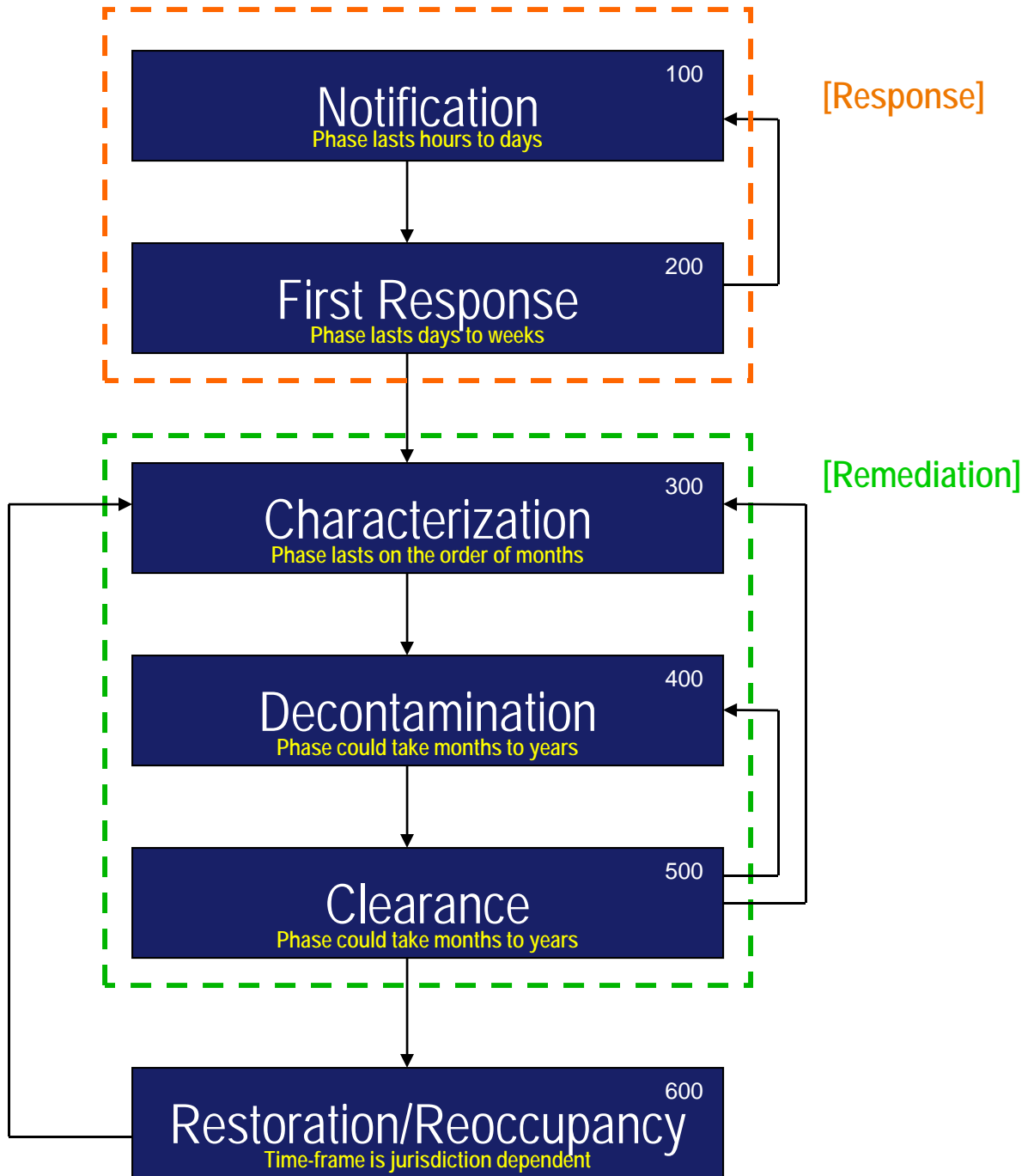
At the conclusion of Task 1, work continued on the expanded framework to generate this Operational Decision Framework which is consistent with the existing interagency general risk management framework. A large LLNL task group met repeatedly over a three-month period to develop the expanded framework, coordinate the framework with the biological remediation checklist, and synchronize the logic with the Consequence Management Plan table of contents.

The expanded framework was briefed at a large table top exercise reviewing the interagency risk management framework. This exercise had representation from major US metropolitan areas as well as national agencies. This product received positive comments from the participants.

Upon completion of the Operational Decision Framework, another joint LLNL/SNL working group conducted a day-long review. Identified modifications were made to the document, resulting in the included product.

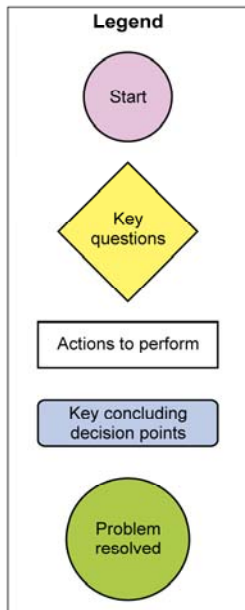
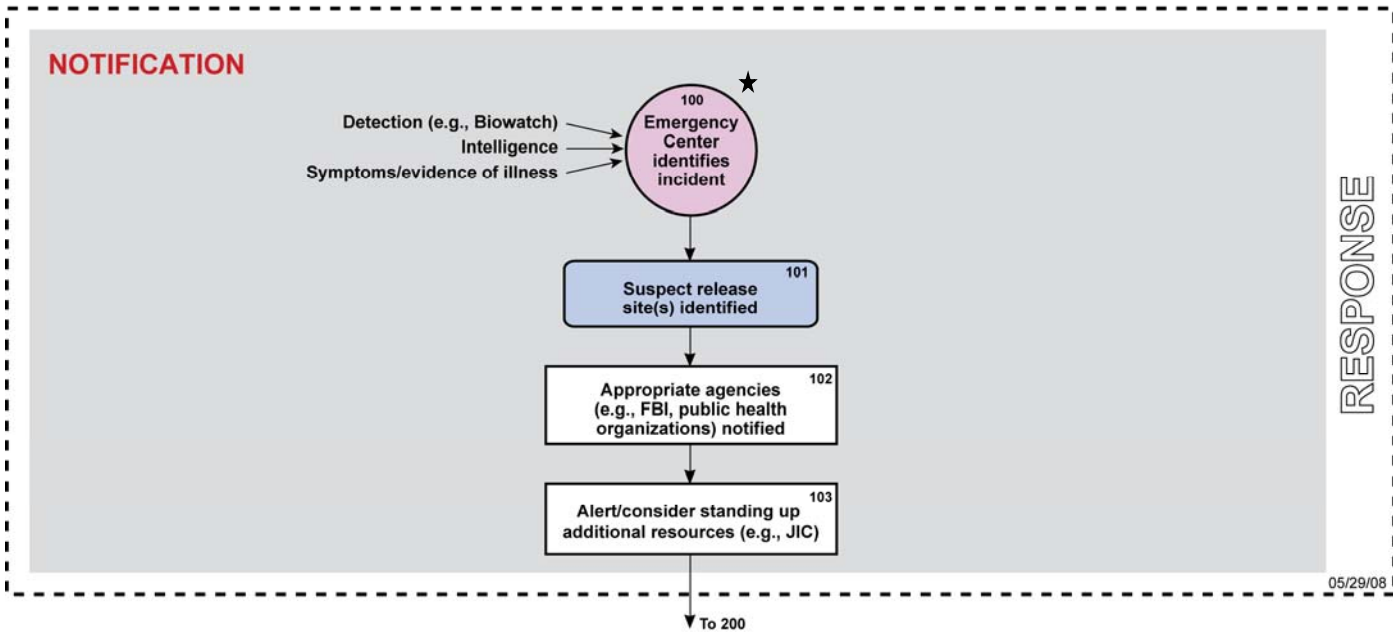
Special thanks are given to the extensive contributions of the LLNL author team, as well as to the technical review and comments from the SNL contributors.

Operational Phases for Response and Consequence Management Framework



Steps can proceed in parallel,
are iterative and multiple
areas or facilities can be addressed
independently or simultaneously

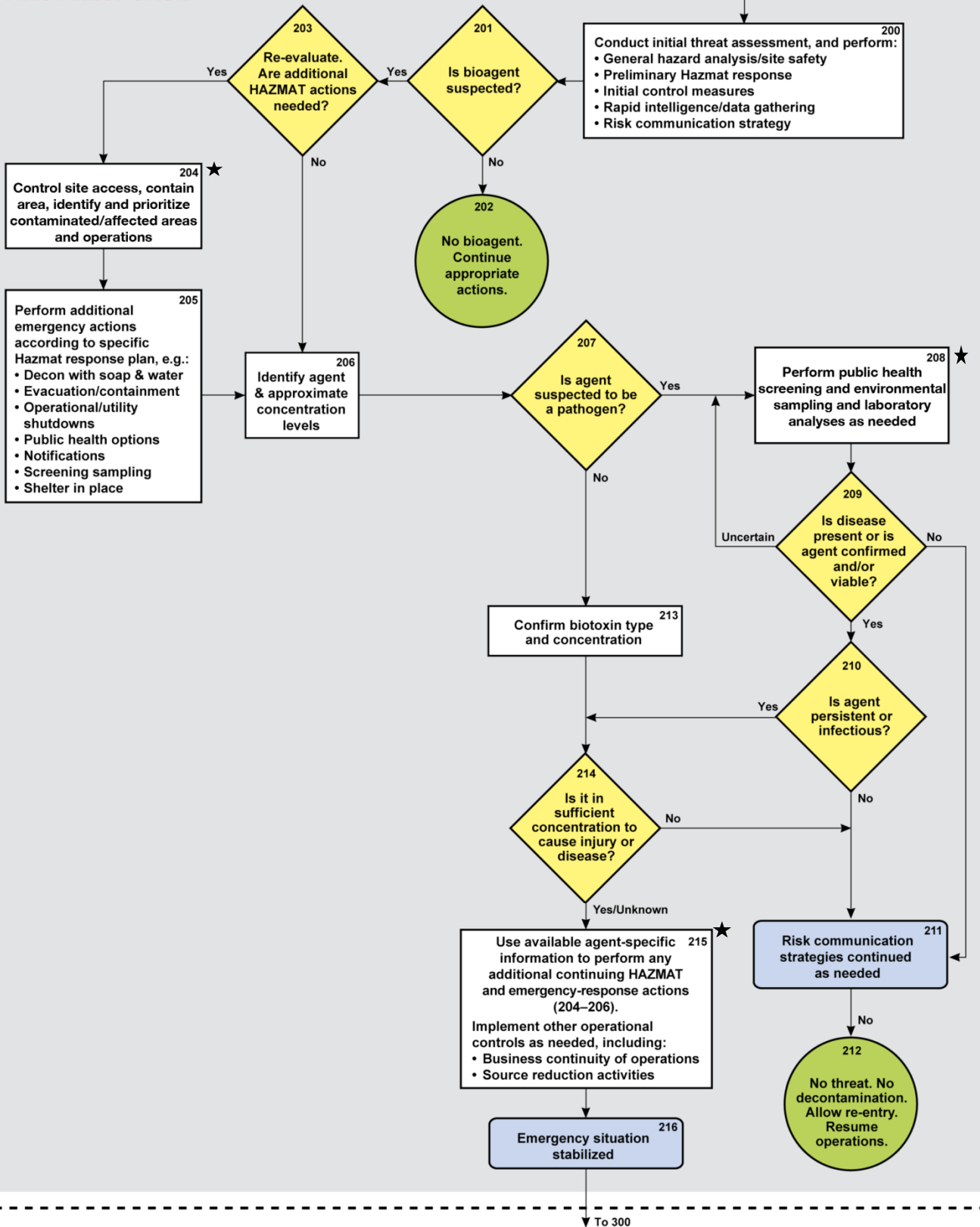
Biological Agent Incident-Response Decision Process (1 of 5)



Biological Agent Incident-Response Decision Process (2 of 5)

From 103

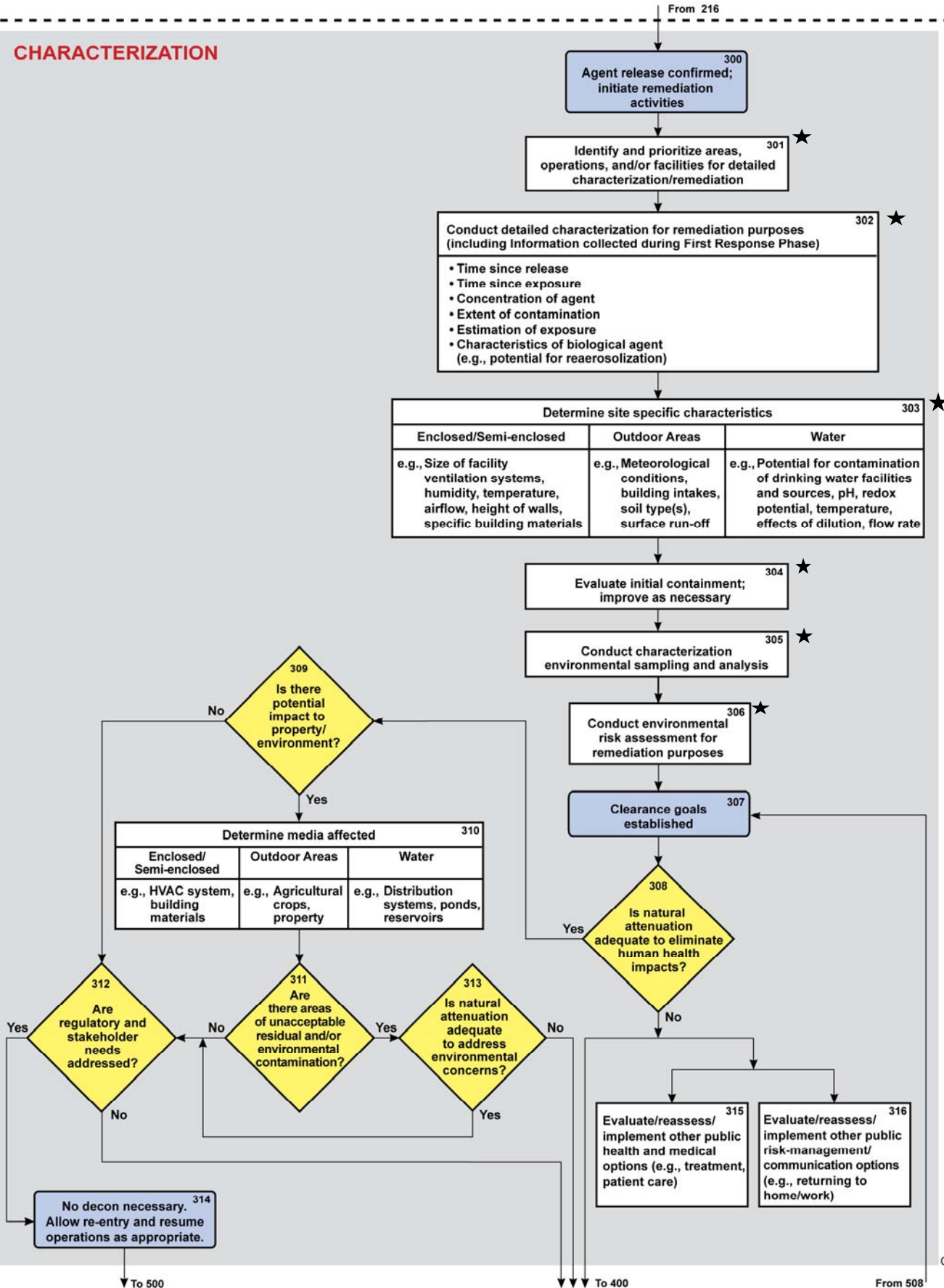
FIRST RESPONSE



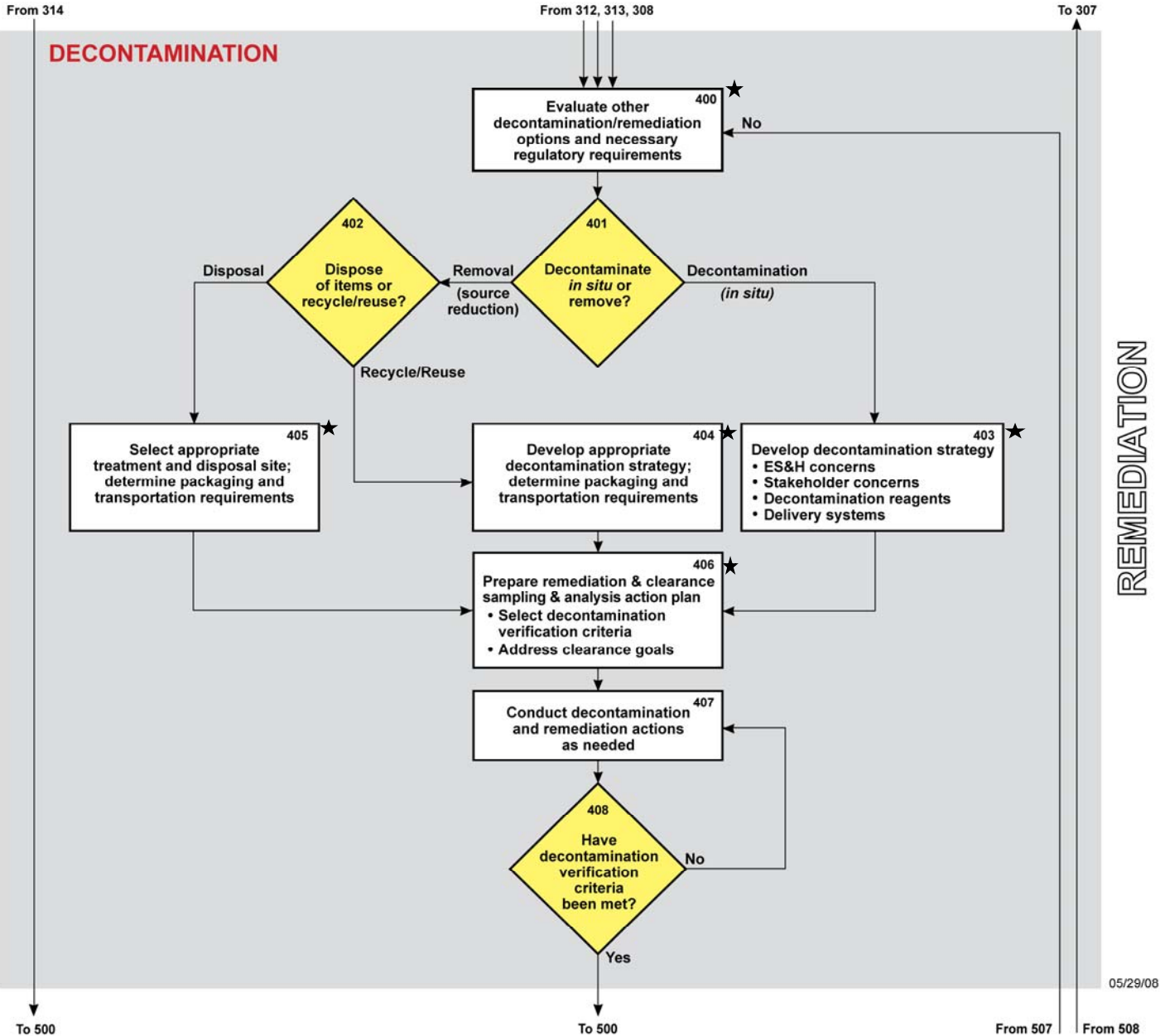
RESPONSE

Biological Agent Incident-Response Decision Process (3 of 5)

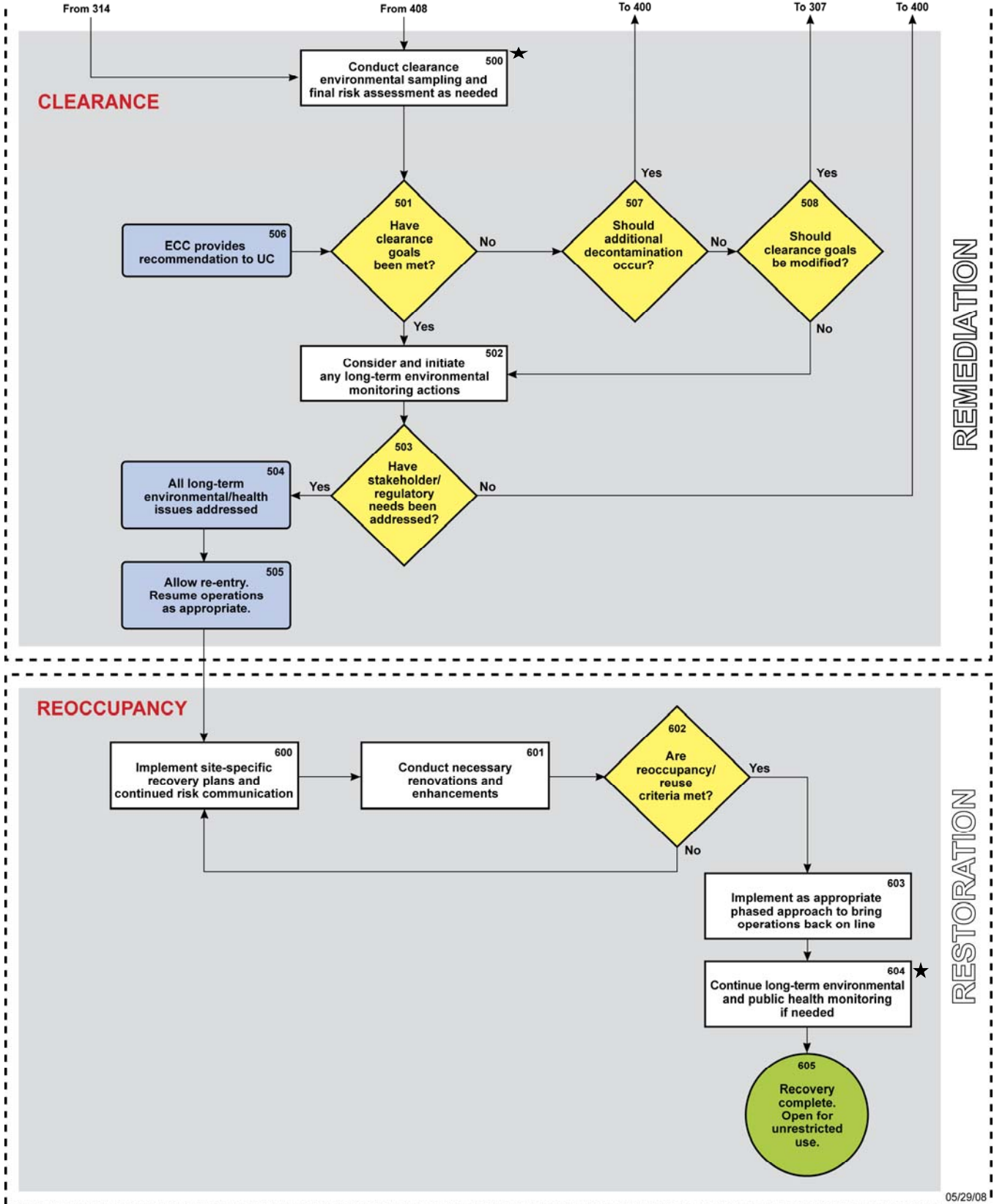
CHARACTERIZATION



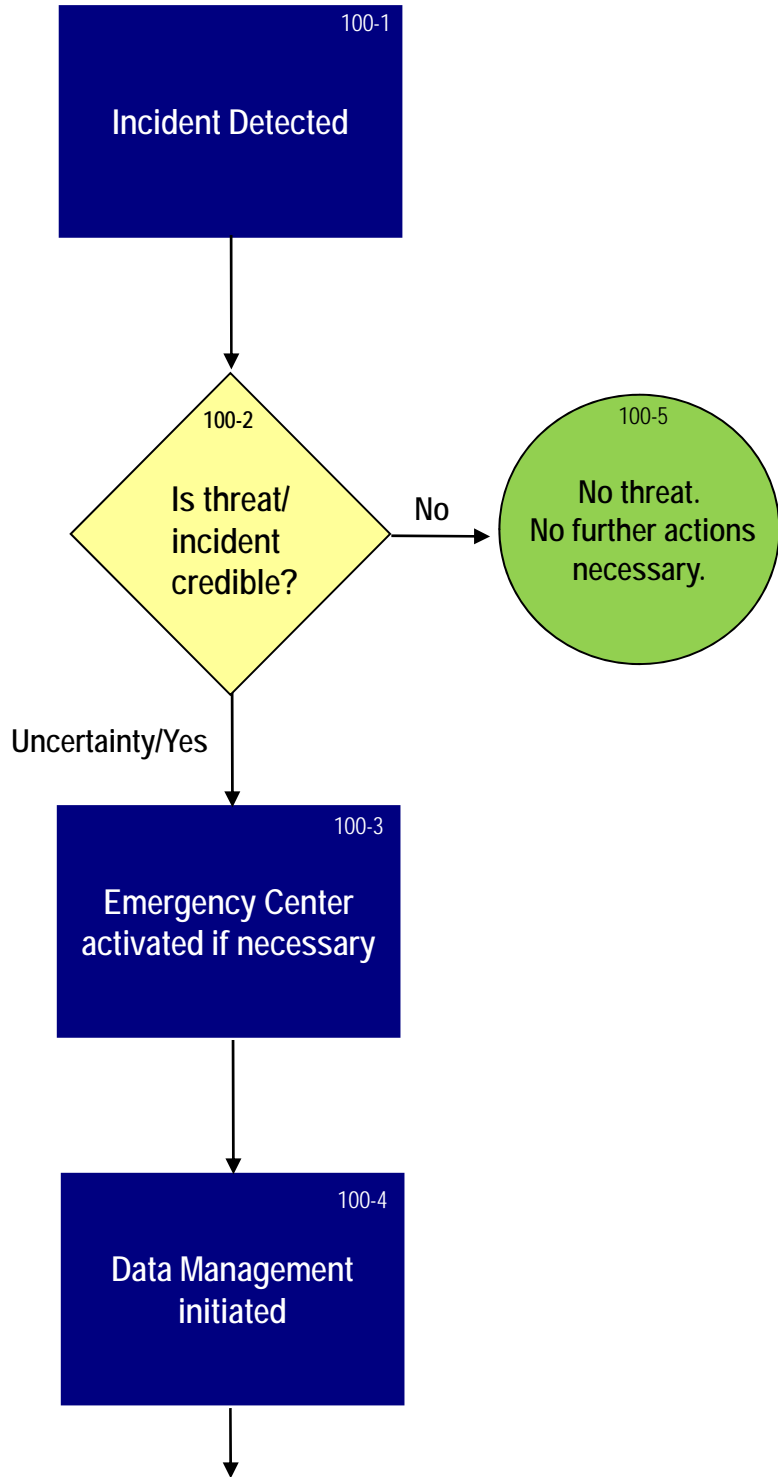
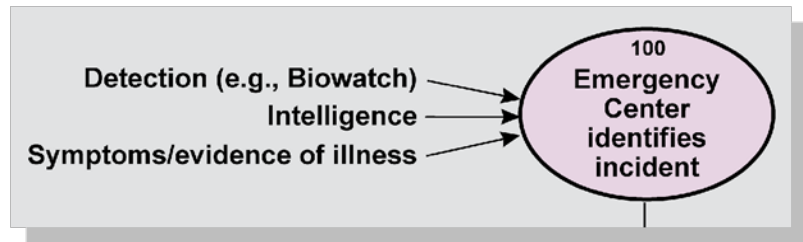
Biological Agent Incident-Response Decision Process (4 of 5)



Biological Agent Incident-Response Decision Process (5 of 5)

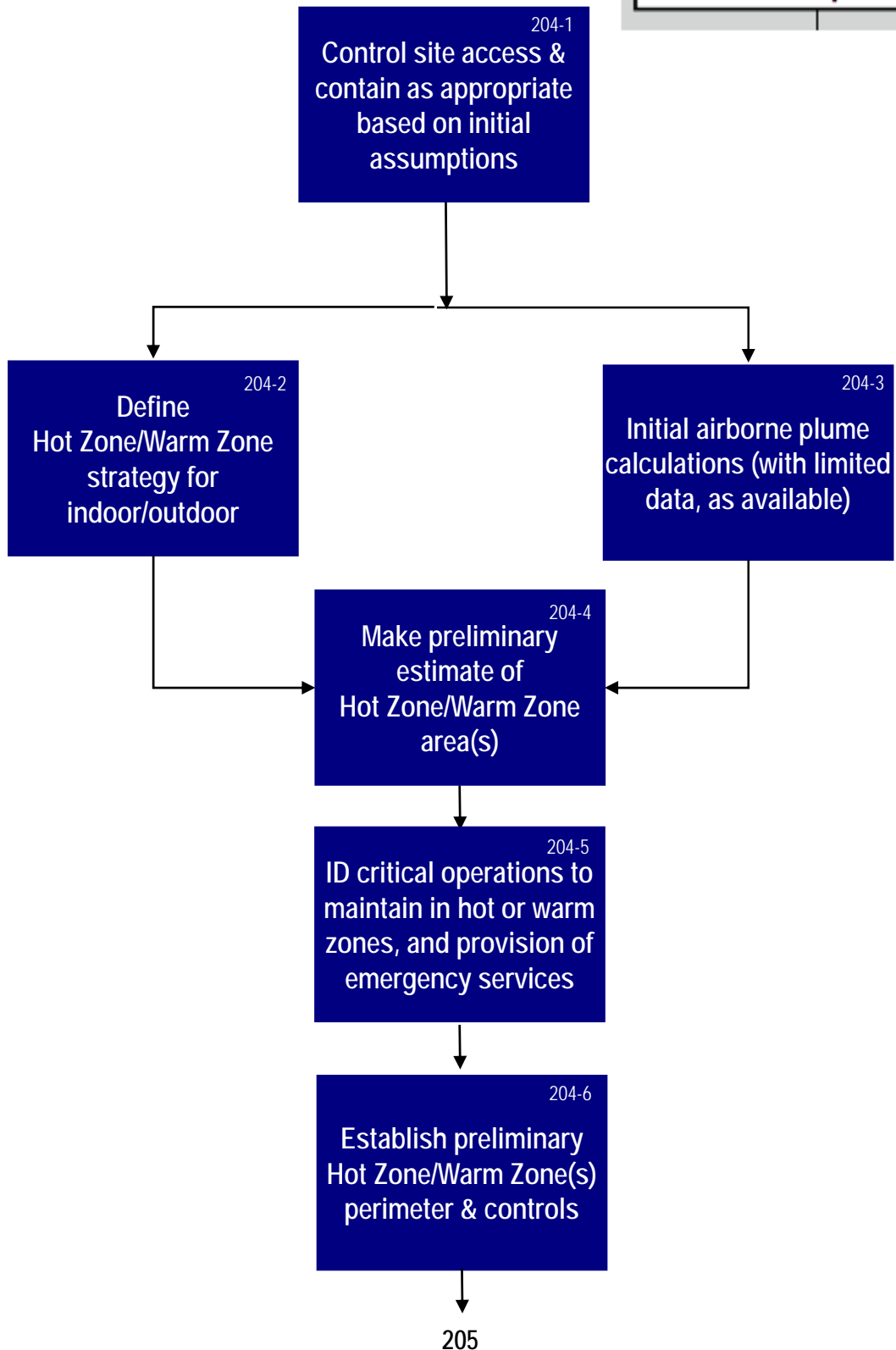


NOTIFICATION (100 Expanded)



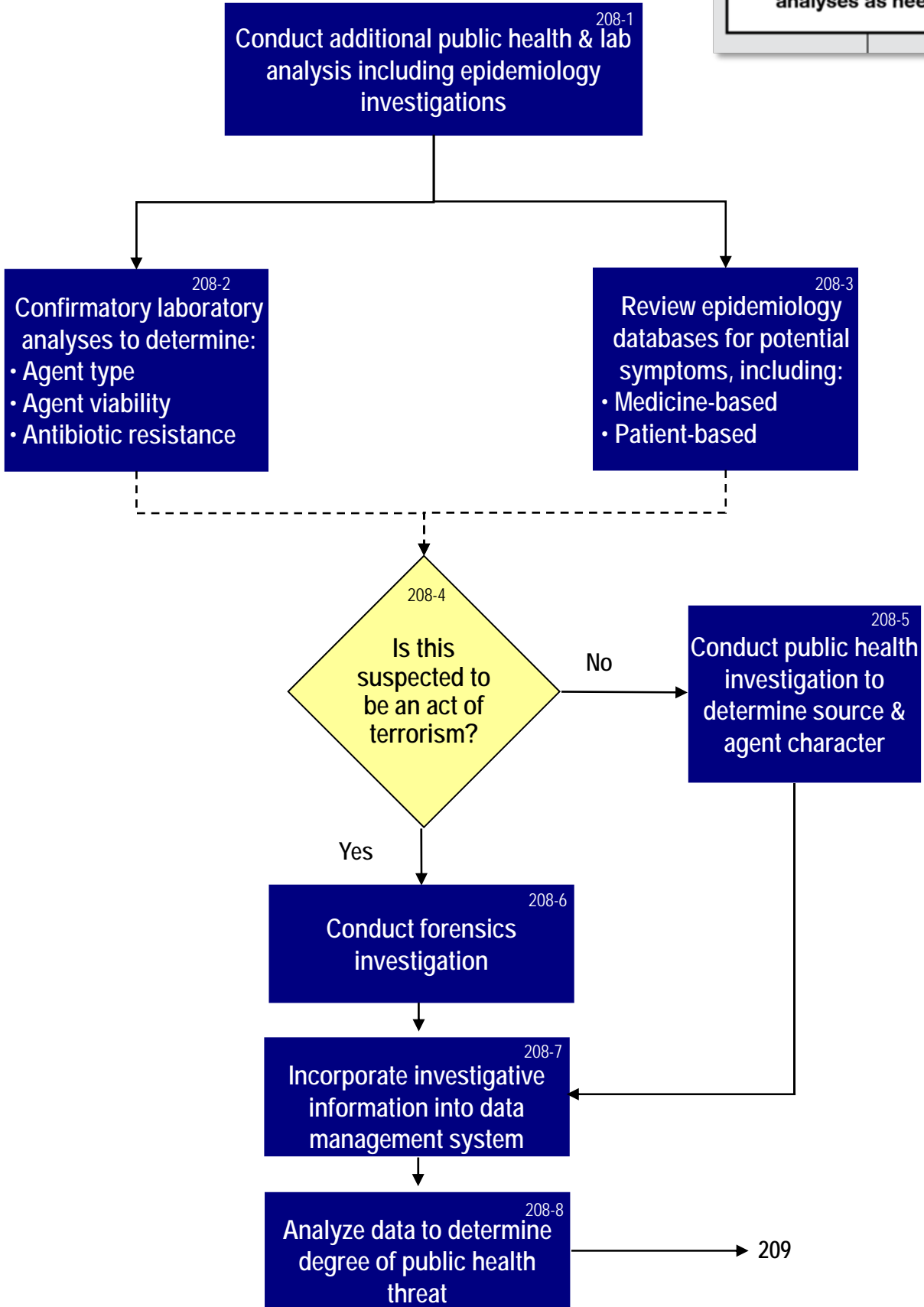
FIRST RESPONSE (204 Expanded)

204
Control site access, contain area, identify and prioritize contaminated/affected areas and operations

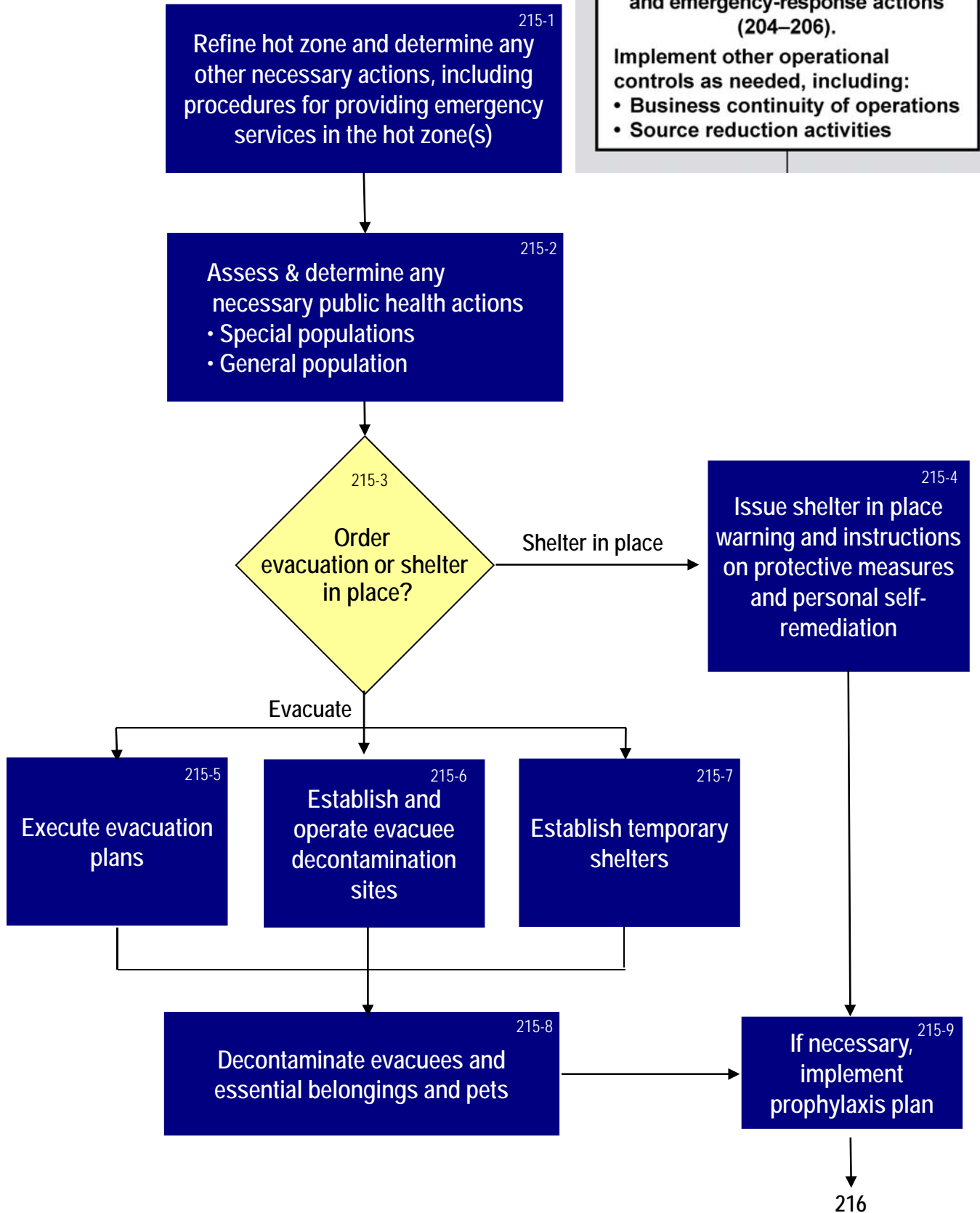


FIRST RESPONSE (208 Expanded)

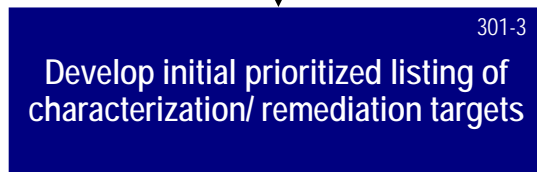
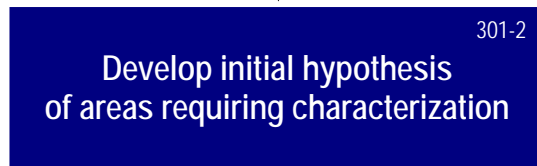
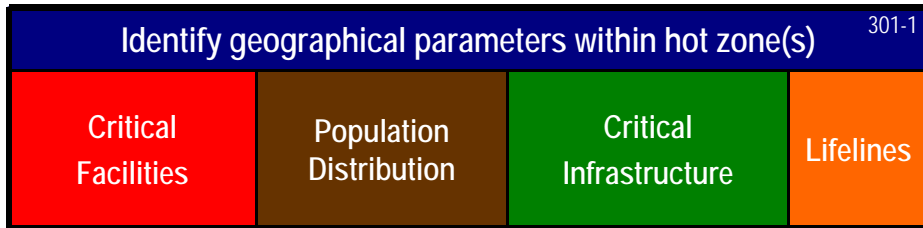
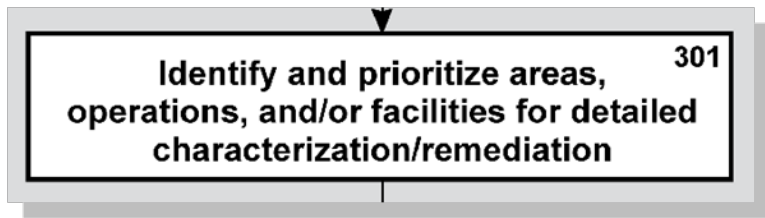
208
Perform public health screening and environmental sampling and laboratory analyses as needed



FIRST RESPONSE (215 Expanded)



CHARACTERIZATION (301 expanded)

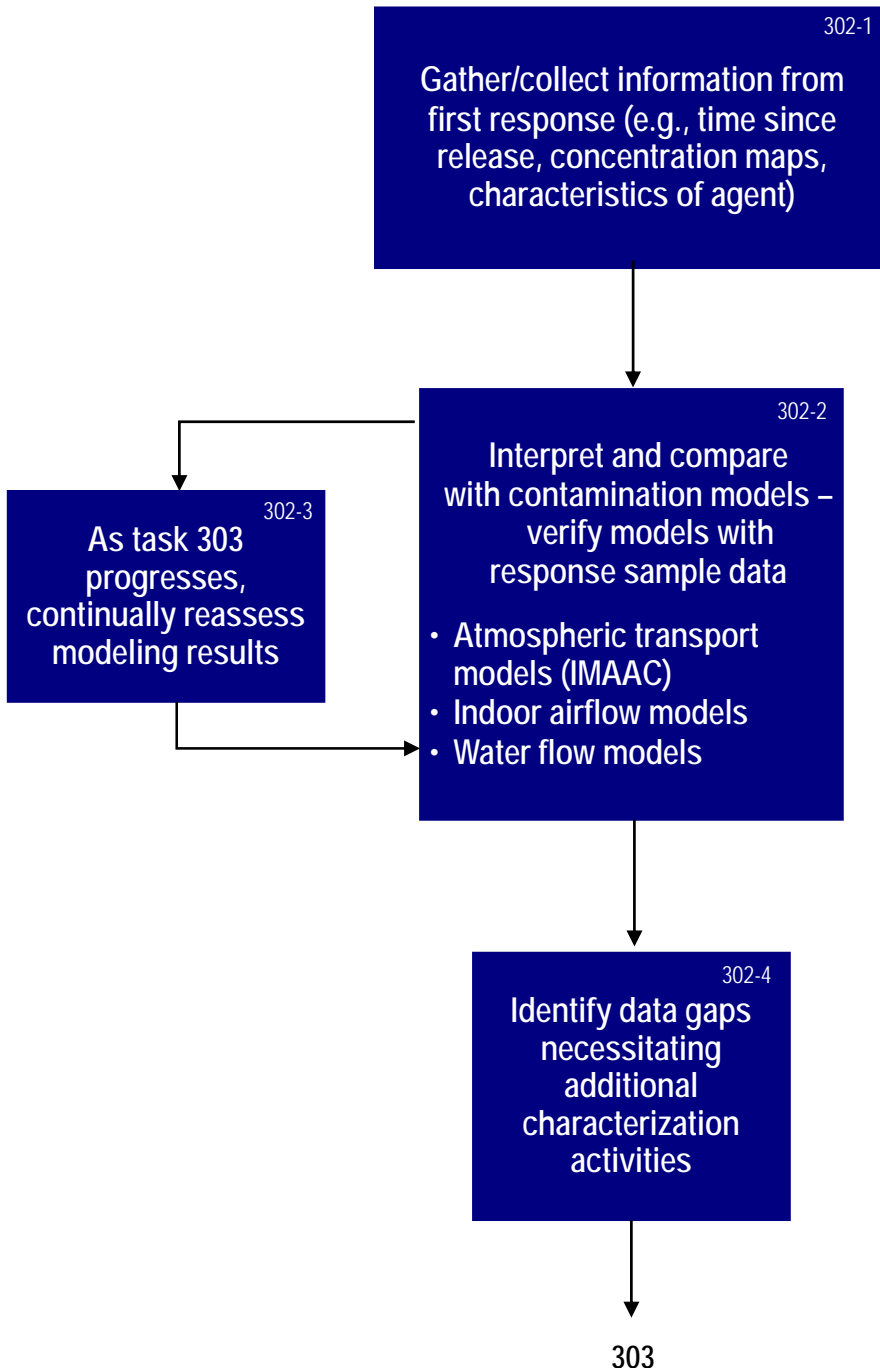


302

CHARACTERIZATION (302 expanded)

302
Conduct detailed characterization for remediation purposes
(including Information collected during First Response Phase)

- Time since release
- Time since exposure
- Concentration of agent
- Extent of contamination
- Estimation of exposure
- Characteristics of biological agent
(e.g., potential for reaerosolization)



CHARACTERIZATION (303 expanded)

Determine site specific characteristics 303		
Enclosed/Semi-enclosed	Outdoor Areas	Water
e.g., Size of facility ventilation systems, humidity, temperature, airflow, height of walls, specific building materials	e.g., Meteorological conditions, building intakes, soil type(s), surface run-off	e.g., Potential for contamination of drinking water facilities and sources, pH, redox potential, temperature, effects of dilution, flow rate

Determine contamination vulnerabilities and characteristics for all components within affected areas based on understanding of transport mechanisms 303-1		
Enclosed/Semi-enclosed structures	Outdoor Areas	Water
<ul style="list-style-type: none"> • Exposure pathways • Facility transport systems • Porous/nonporous surface areas • Characteristics of materials • Soil presence • Potential contamination reservoirs 	<ul style="list-style-type: none"> • Soil types • Surfaces • Vegetation • Environmental conditions • Transport mechanisms • Reaerosolization potential 	<ul style="list-style-type: none"> • All connections and components of the drinking water system • All connections and components of the surface water handling system, to include runoff maps and flow rates • Physico-chemical characteristics of water in both drinking water and runoff systems • All connections and components of the waste water system

303-2
Compile a list of geographically located potential contamination sites

303-3
Map potential contamination sites, lifelines, and residual population

303-4
Update models in 302 as appropriate

303-5
Develop characterization priorities, coordinating outdoor and indoor/semi-enclosed areas

CHARACTERIZATION (304 expanded)

Evaluate initial containment;
improve as necessary

304

Update hot zone(s)
boundaries³⁰⁴⁻¹

Adjust warm zone(s)
boundaries³⁰⁴⁻²

Adjust boundary controls
as necessary³⁰⁴⁻³

Seal buildings & HVAC
systems within hot zone(s)³⁰⁴⁻⁴

Implement methods to
minimize outdoor
reaerosolization³⁰⁴⁻⁵

Isolate water distribution,
wastewater, & storm drain
systems within hot zone³⁰⁴⁻⁶

Continue to reassess hot and warm
zone boundaries as characterization
and clearance progress³⁰⁴⁻⁷

305

CHARACTERIZATION (305 expanded)

305
Conduct characterization
environmental sampling and analysis

Develop comprehensive characterization sampling strategies

305-1

- Consider a phased approach to rapidly refine the limits of contamination
- Develop data quality objectives
- Consider statistical and judgmental criteria
- Employ iterative modeling approach to optimize sampling
- Establish minimum characterization sampling requirements
- Consider employing a zonal approach for sampling
- Consider surface, air, and forced air sampling
- Address all necessary information requirements for risk assessment (including inhalation, cutaneous or gastrointestinal risks)

Write incident specific

Characterization Sampling and Analysis Plan(s) (SAP)

305-2

- Select sampling methods
- Select sampling locations
- Select analytical methods
- Identify resource limitations and optimize implementation

Enclosed/semi-enclosed

Outdoor

Water

Conduct characterization sampling and analysis

305-3

Enclosed/semi-enclosed

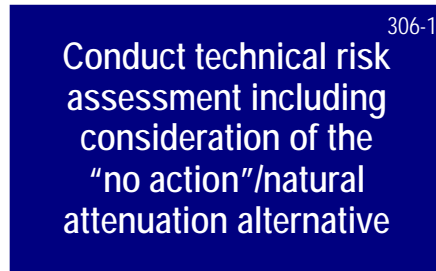
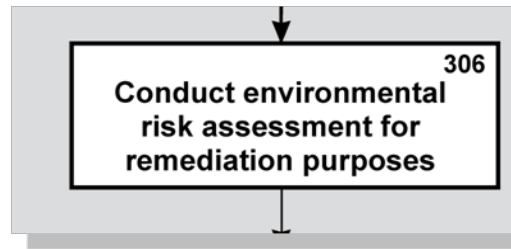
Outdoor

Water

Re-evaluate and adjust sampling
strategy, plans, and methods
as necessary

305-4

CHARACTERIZATION (306 expanded)



307

An arrow points down from the bottom of the 306-3 box to the number 307.

DECONTAMINATION (expanded 400)

Evaluate other decontamination/remediation options and necessary regulatory requirements

400

400-1

Evaluate decontamination options for media affected, considering for example: Volume, Extent of contamination, Availability of resources, Accessibility, Weather

Enclosed/ Semi-enclosed	Outdoor Areas		Water
e.g., HVAC system, building materials, fixed & moveable property, sensitive equipment, rolling stock	Natural e.g., soil, vegetation, agricultural crops, livestock	Man-made e.g., building exteriors, pavement structures, fixed and moveable property, sensitive equipment, rolling stock	e.g., Distribution systems, ponds, reservoirs, recreational water

400-2

Evaluate citizen-performed decon options

400-3

Identify and assess consistency of decon options with regulatory requirements

401

DECONTAMINATION (expanded 403)

- 403
- Develop decontamination strategy
 - ES&H concerns
 - Stakeholder concerns
 - Decontamination reagents
 - Delivery systems

403-1

Select decontamination methods including specific reagents and reagent delivery systems for media affected, considering for example:
Volume, Extent of contamination, Availability of resources, Accessibility, Weather

Enclosed/ Semi-enclosed	Outdoor Areas		Water
e.g., HVAC system, building materials, fixed and moveable property, sensitive equipment, rolling stock Considering: • Surface treatment • Volumetric methods	Natural e.g., soil, vegetation, agricultural crops, livestock	Man-made e.g., building exteriors, pavement structures, fixed and moveable property, sensitive equipment, rolling stock	e.g., Distribution systems, ponds, reservoirs, recreational water Considering: • Treatment • No treatment and monitor
	Considering: • Localized treatment • Wide area treatment • Wash down and treat		

↓

403-2

Develop emergency response plans to address potential uncontrolled reagent release(s)

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403-3

Develop worker safety strategies for each method

↓

403-4

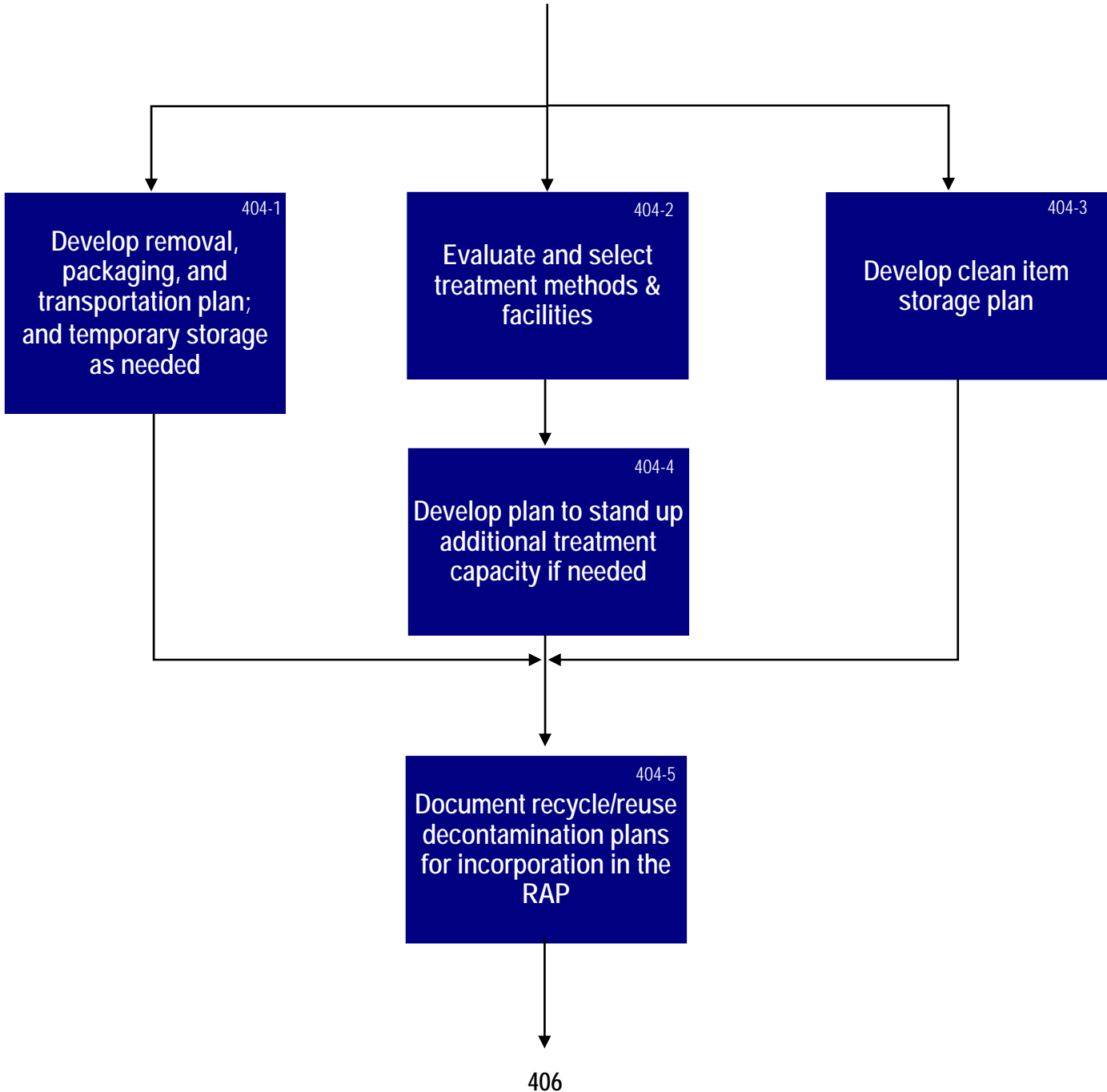
Identify stakeholder concerns for each decon method selected

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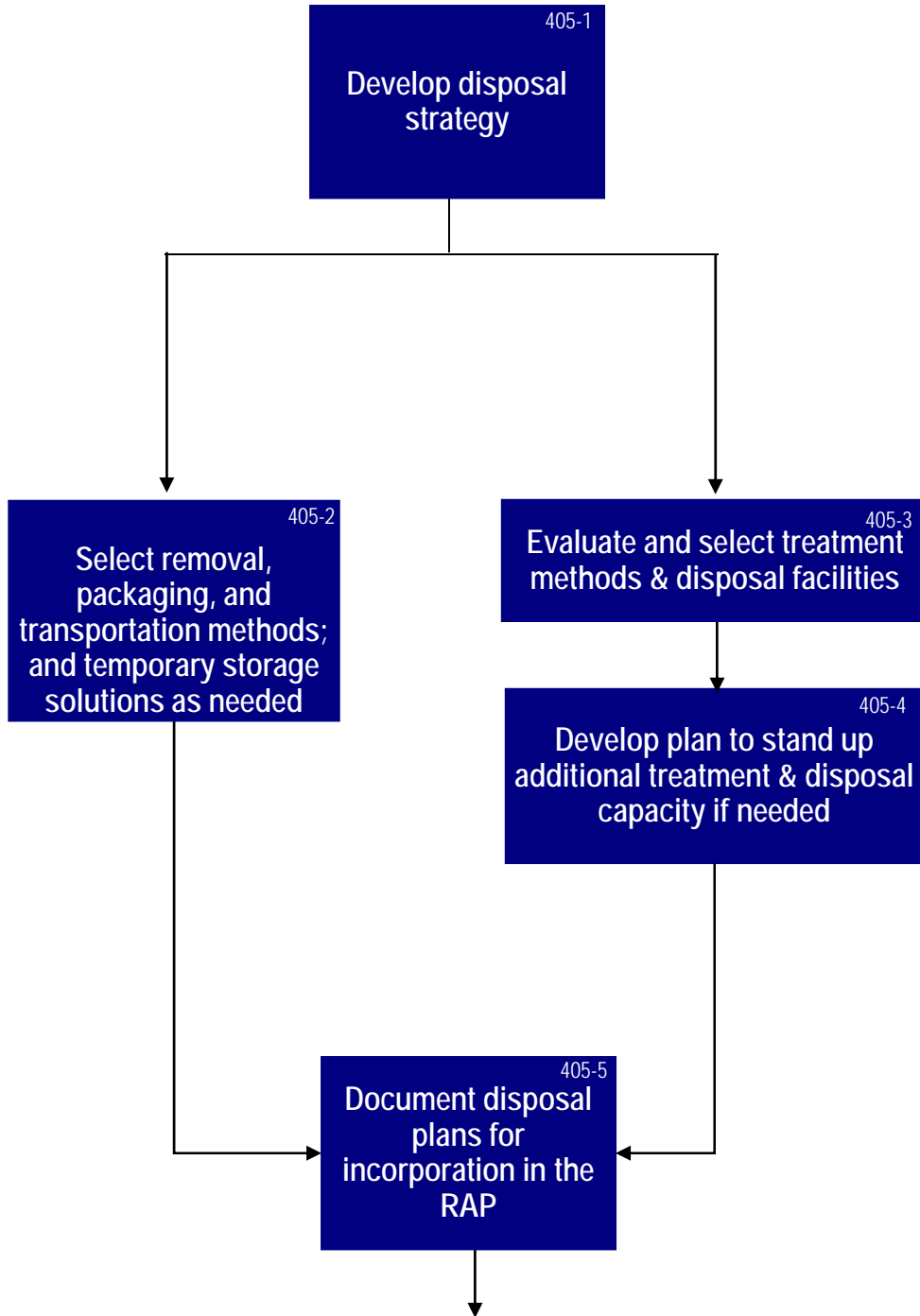
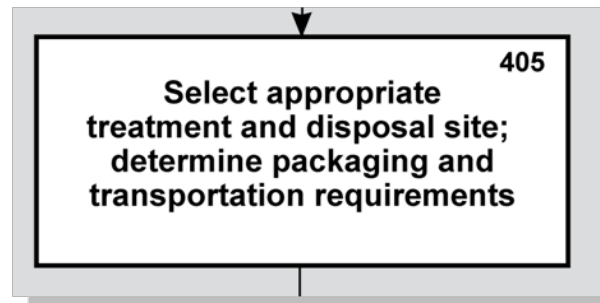
403-5

Document comprehensive decontamination plans for incorporation in the RAP including prioritization of decontamination activities

DECONTAMINATION (expanded 404)



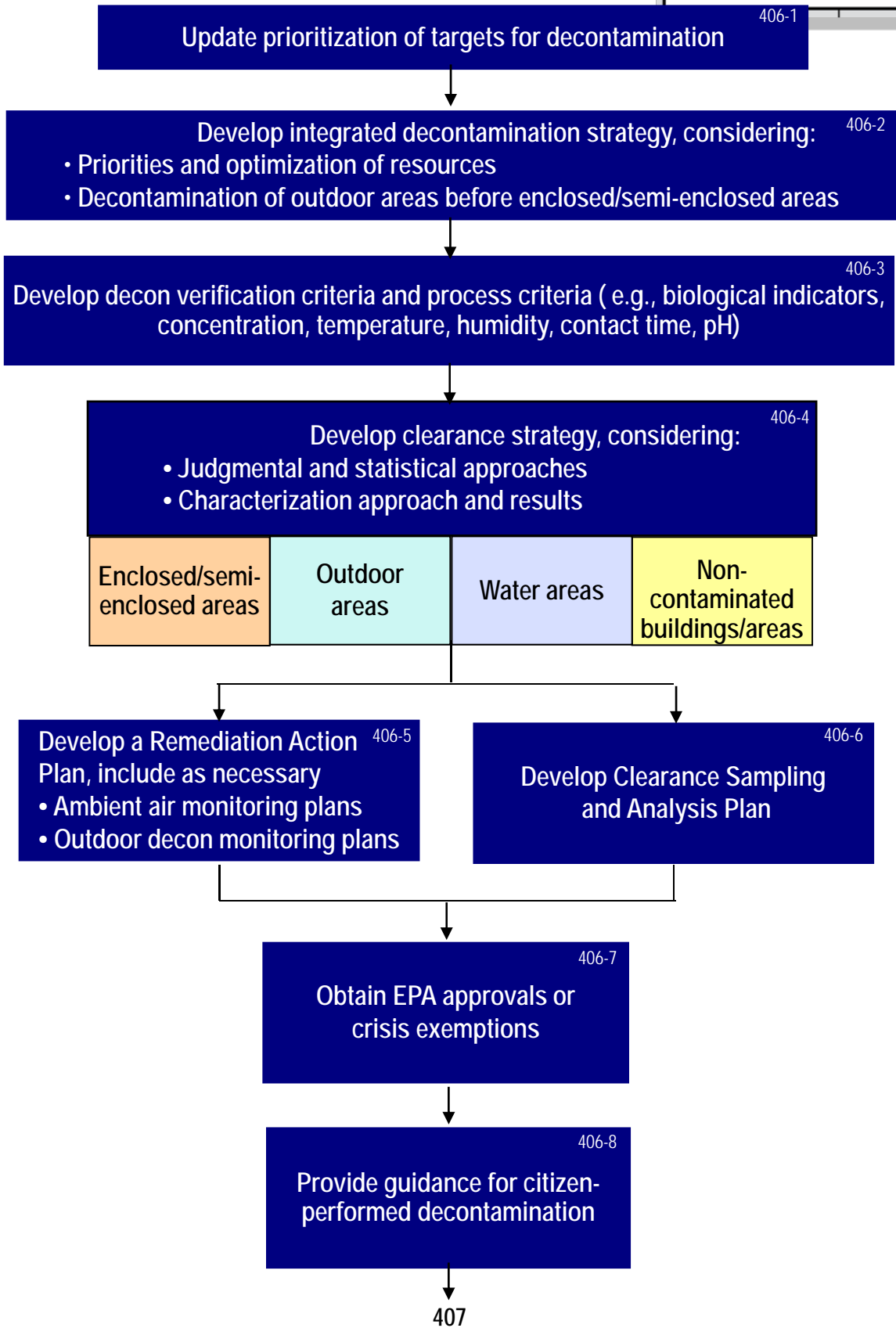
DECONTAMINATION (expanded 405)



DECONTAMINATION (expanded 406)

406
Prepare remediation & clearance sampling & analysis action plan

- Select decontamination verification criteria
- Address clearance goals



CLEARANCE (expanded 500)

Conduct clearance environmental sampling and final risk assessment as needed 500

500-1
Reassess need for clearance in non-contaminated potentially impacted areas

500-2
Reassess Clearance Sampling and Analysis Plan based on priorities, dependencies, and potential for recontamination

500-3
Execute Clearance Sampling and Analysis Plan

500-4
Conduct final technical risk assessment, considering results from clearance sampling

500-5
Consider socio-economic implications

501

REOCCUPANCY (expanded 604)

