

Presentation to the Science Advisory Board

March 19, 2018



Drinking Water Standards and Development of Regulations

Jessica C. Godreau, PE, BCEE, Chief
Public Water Supply Section

NC Department of Environmental Quality

North Carolina Drinking Water Act

- NCDEQ primary enforcement authority for Safe Drinking Water Act implementation
 - NC adopts the federal drinking water standards/ regulations
- The North Carolina Drinking Water Act - G.S 130A-315
 - Broad authority to set regulatory contaminant levels for drinking water
 - No criteria or processes to guide regulation development
- Diverge from federal regulations for NC has used its authority under the NC Drinking Water Act to develop regulations relating to:
 - Iron and manganese (enforceable)
 - Arsenic (adopted earlier)
 - Trihalomethanes (adopted earlier for small systems) and
 - Chlorine residual (at coliform sites)
 - Has **not** included developing state-specific regulatory levels, but expanding the applicability of EPA-established levels



What is a Public Water System?

- “Public” does not refer to ownership of the system: public water systems can be publicly or privately owned
- A Public Water System
 - Serves 15 or more connections, or 25 or more people 60 or more days per year
 - Categorized as:
 - Community
 - Non-Transient Non-Community
 - Transient Non-Community



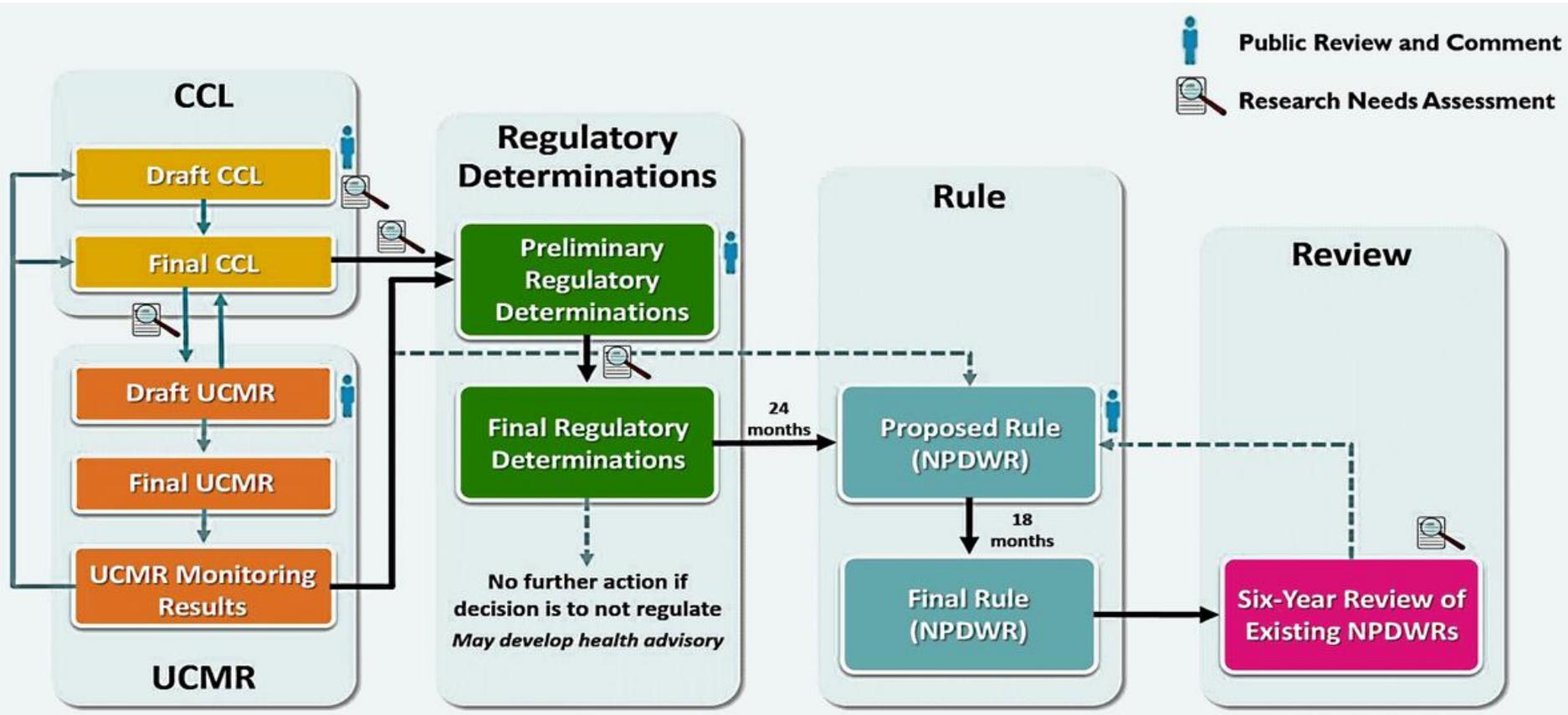
Federal Safe Drinking Water Act (SDWA)

Enacted in 1974, and amended and reauthorized in 1986 and 1996

- Authorizes EPA to set national standards for drinking water to protect against health effects from exposure to naturally-occurring and man-made contaminants
- Maximum Contaminant Level Goals (MCLGs) vs. Maximum Contaminant Levels (MCLs) and Treatment Techniques
- Applies to Public Water Systems



Federal Development of Regulations

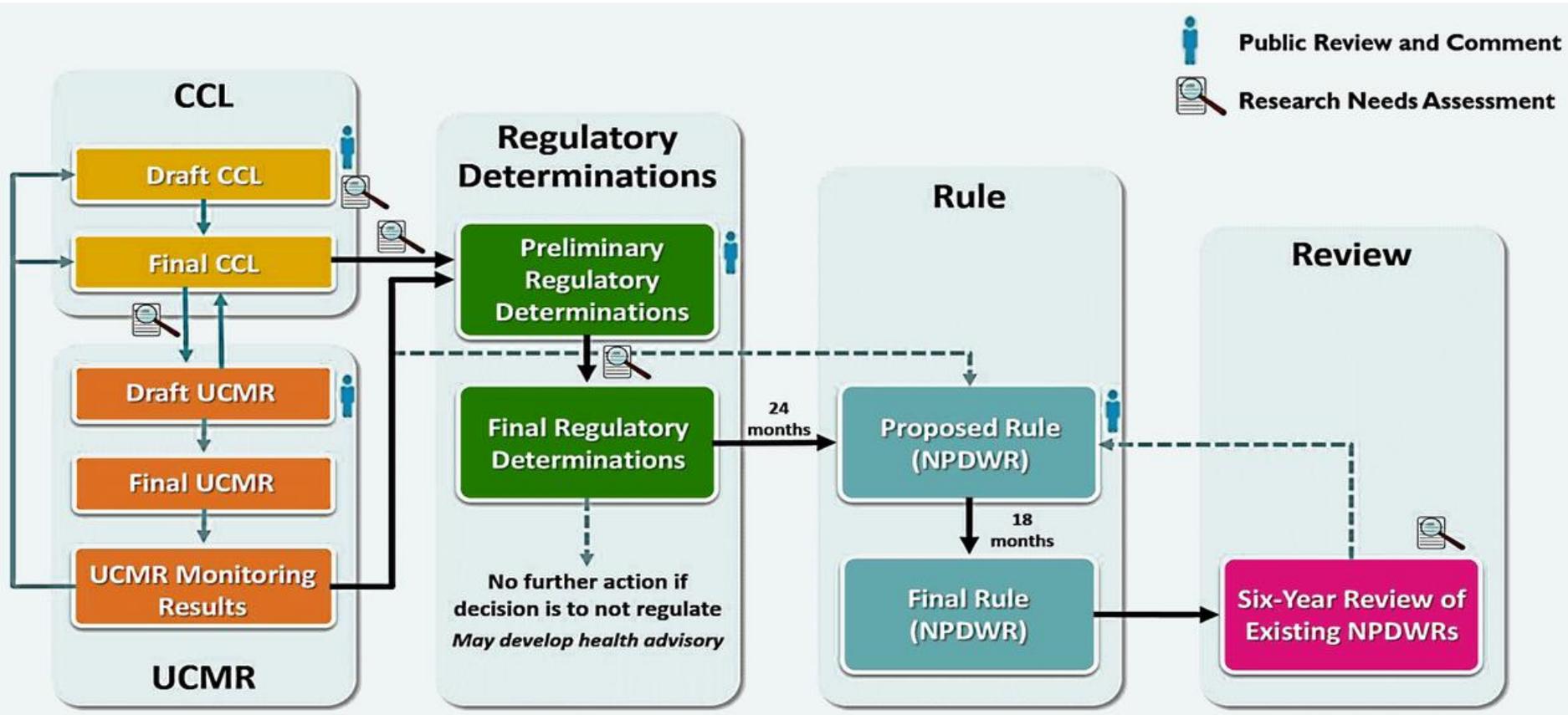


Federal Development of Regulations Contaminant Candidate List (CCL)



- EPA collects data and encourages research on listed contaminants to better understand their health impacts and levels in drinking water:
 - Known or anticipated to occur in drinking water,
 - Not subject to any proposed or promulgated federal drinking water regulation,
 - Include contaminants of the greatest public health concern in drinking water
- Used for:
 - Identifying priority contaminants for information collection, and
 - Making Regulatory Determinations for contaminants with sufficient health and occurrence data
- EPA must consider occurrence and health effects when placing on the list
- Final CCL4 Includes 97 chemicals or chemical groups and 12 microbiological contaminants

Federal Development of Regulations



Federal Development of Regulations

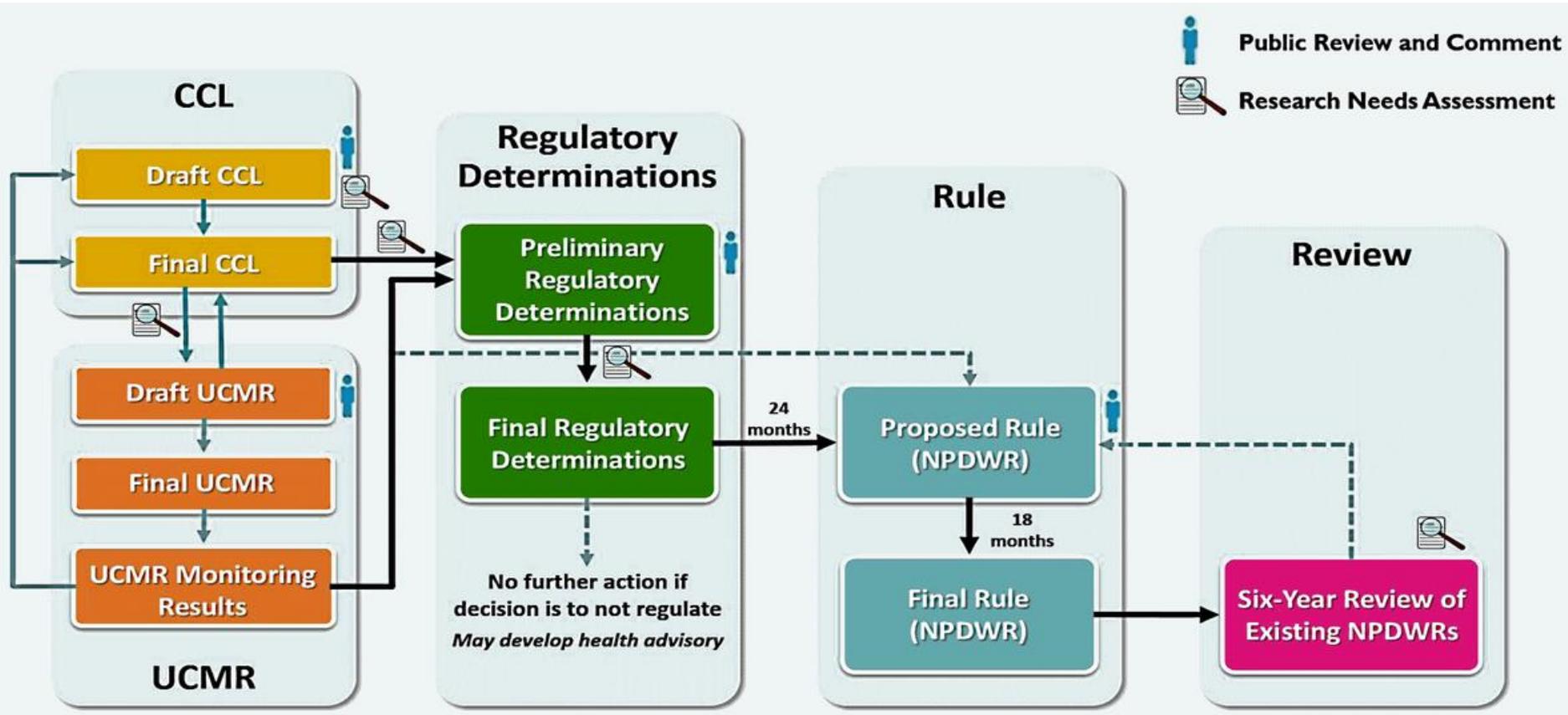
Unregulated Contaminant Monitoring Rule



- Occurrence monitoring for no more than 30 contaminants every five years
- Collect data for contaminants suspected to be present in drinking water and with no health-based standards under the SDWA
- Consider contaminants from prior UCMR and the CCL, and from current occurrence and health risks research
- Prioritize further based on more extensive health effects evaluations, typically performed by the Office of Water's Office of Science and Technology
- Generally doesn't include chemicals not registered for use in the USA, with no analytical reference standard, or with no analytical method ready for use
- Applies to all systems > 10,000 people and statistical sampling of smaller systems
 - *Note – EPA pays for the sampling for systems <= 10,000 people*



Federal Development of Regulations



Federal Development of Regulations

Regulatory Determination



- EPA's formal decision of whether it should regulate a contaminant
- Must make a determination for at least 5 contaminants from the most recent CCL within 5 years of the last regulatory determination

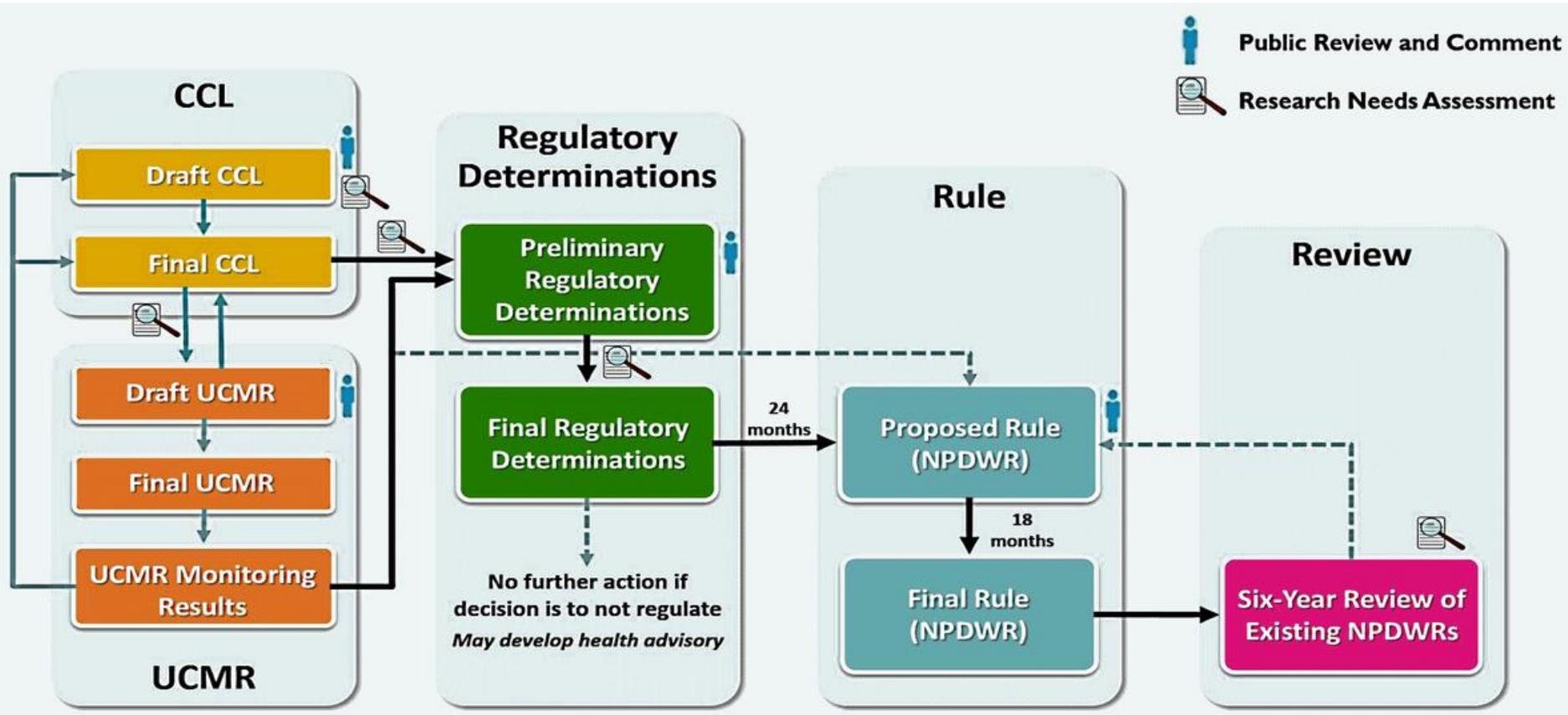
To regulate a contaminant, SDWA requires that EPA determine whether:

- *The contaminant may have an **adverse effect** on the health of persons;*
- *The contaminant is known to occur or there is a substantial likelihood the contaminant will **occur in public water systems** with a frequency and at levels of public health concern; and*
- *In the sole judgment of the Administrator, regulation of the contaminant presents a **meaningful opportunity for health risk reductions** for persons served by public water systems.*

Note: If EPA decides not to regulate a contaminant, they may still develop a non-enforceable health advisory to serve as technical guidance for federal, state, and local officials.



Federal Development of Regulations



Federal Development of Regulations: Maximum Contaminant Level Goals (MCLG)

- **MCLG** - *The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, allowing an adequate margin of safety.*
- Non-enforceable public health goals
- Consider only public health and not the limits of detection and treatment technology effectiveness
- Consider the adverse health risk to sensitive subpopulations such as infants, children, the elderly, and those with compromised immune systems and chronic diseases
- May be set at levels which water systems cannot reasonably meet
- Analogous to a Health Advisory Level

Federal Development of Regulations: MCLGs

MCLGs depend on the type of contaminant targeted for regulation:

Microbial contaminants – MCLG is set at *zero* because ingesting one protozoan, virus, or bacterium may cause adverse health effects.

Chemical contaminants that are carcinogens –

- MCLG is set at *zero* if there is evidence that a chemical may cause cancer AND there is no dose below which the chemical is considered safe.
- If a chemical is carcinogenic and a safe dose can be determined, EPA sets the MCLG at a level above zero that is considered safe.

Chemical contaminants that are non-carcinogens but can cause adverse non-cancer health effects (e.g., reproductive effects) -

- MCLG is based the *reference dose*: an estimate of the amount of a chemical that a person can be exposed to on a daily basis that is not anticipated to cause adverse health effects over a lifetime.

Federal Development of Regulations

Health Risk Reduction and Cost Analysis



SDWA requires a **health risk reduction and cost analysis** to:

- Analyze the likely quantifiable and non-quantifiable benefits of compliance with the proposed standard, and
- Analyze certain increased costs resulting from the proposed drinking water standard.

In addition, EPA must consider:

- The **incremental costs/benefits** associated with proposed and alternative MCLs,
- **Adverse health effects** on the general population and sensitive subpopulations,
- Any **increased health risk** to the general population due to the new MCL, and
- Other **relevant factors** such as data quality and the nature of the risks.

Note: Where the benefits of a new MCL do not justify the costs, EPA may adjust the MCL for a particular class or group of systems to a level that "maximizes health risk reduction benefits at a cost that is justified by the benefits."



Federal Development of Regulations Enforceable Standards

MCL -

- *Maximum level allowed of a contaminant in water which is delivered to any user of a public water system*
- *Set as close to the MCLG as feasible, considering the ability of water systems to comply technologically and economically, as well as the benefits gained*
- *Does not result in zero-risk water*

Treatment technique –

- *An enforceable process intended to reduce the level of a contaminant in drinking water*
- *Used when there is no reliable method that is economically and technically feasible to measure a contaminant at concentrations showing there is not a public health concern*
 - *e.g., Surface Water Treatment Rule (disinfection and filtration) or Lead and Copper Rule (optimized corrosion control)*

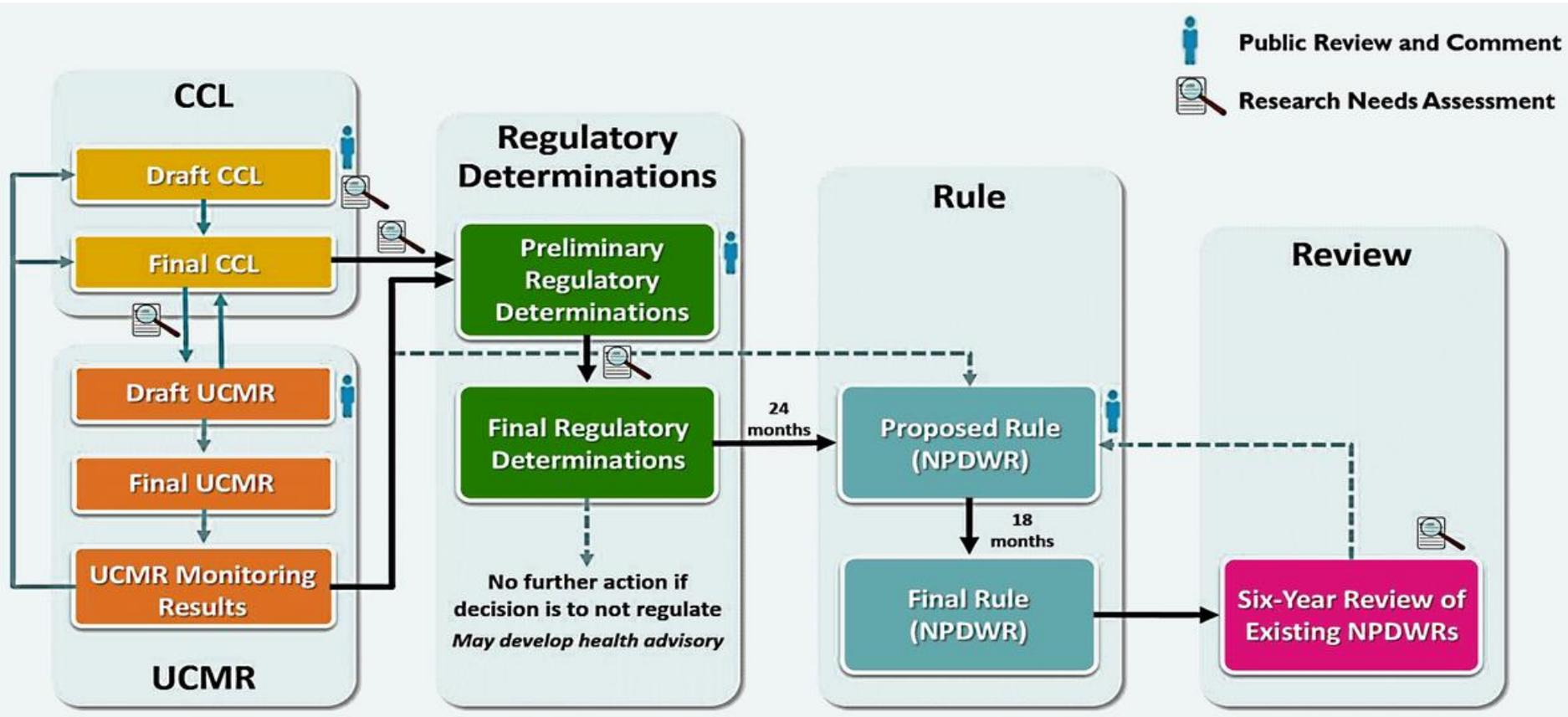
Turning the Standard Into An Implementable Rule

- Monitoring schedules and compliance requirements:
 - Who? Which type of water systems are regulated?
 - Where to sample? entry point, distribution system, etc.
 - When? Frequency of sampling: initial, reduced, increased
 - Exceptions? Waivers, variances or exemptions?
 - Sampling? Sample collection methods, sample sizes, holding times
 - Analytical methods and detection limits
 - Lab capacity
- Database compliance routines for identifying and tracking violations
- Mandatory language and health effects language to be used in Public Notifications and Consumer Confidence Reports
- Best available treatment (BAT) technologies
- Training and Guidance documents and materials for the state and for utilities

All decisions must be based on data and sound science, which may not yet exist for trace organic constituents not part of the EPA regulatory development process



Federal Development of Regulations



Considerations/Constraints for State Development of Standards/Regulations



State Staff Resources, Expertise and Funding:

- Unlike anything NCDEQ has done; limited national models
- Resource needs would be significant
- Any drinking water regulation must consider the same factors as EPA to be implementable

Lack of current data to make informed decisions

- Much research and analysis is needed relating to contaminant occurrence, health effects, analytical methods, treatment technologies, and costs, benefits and economic analysis.

Extra monitoring and treatment costs for water systems

- Many water systems already struggle with maintaining compliance with the drinking water requirements

Simplifying a new state process

- EPA processes (CCL, UCMR, Reg. Determination could provide substantial data to inform a NC process)

