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November 20, 2019

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2600 Blair Stone Road, Mail Station 6511
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Re: Comments on the 2019 Triennial Review of Florida Water Quality Standards

Dear Ms. Sutton,

Please consider the following comments regarding Florida Department of Environmental Protection's (FDEP) proposed changes to the State's water quality standards under the Triennial Review. These comments are being submitted on behalf of Healthy Gulf and are in addition to comments sent during the kick-off process on may 30, 2019.[1] Healthy Gulf reserves the right to rely on all public comments submitted in this matter. We request that the Department incorporate these comments and suggestions into the proposed Triennial Review. If the suggestions are rejected, we request the Department's explanation for such rejections as required by 40 CFR 25.8.

1. **62-302 F.A.C.**

    a. **FDEP should not raise its freshwater water quality criterion for Cadmium to a weaker or less protective standard.**

It appears that FDEP is proposing to adopt EPA recommended Cadmium standards. We support this change.

    b. **FDEP should not revise the maps showing Class II waters without clarifying the process they will use to estimate the boundaries.**

Class II waters are limited to "predominantly marine waters." FDEP stated that it will use GIS resources to determine the extent of the Class II waters, but should further clarify how it will estimate the boundary

[1] Healthy Gulf is committed to uniting and empowering people to protect and restore the natural resources of the Gulf Region, forever protecting it for future generations. Healthy Gulf has members throughout the Gulf states, including Florida. More information is available at healthygulf.org. Please feel free to contact Matt Rota, Senior Policy Director by phone at (504)525-1528x206 or by email at matt@healthygulf.org.

between predominantly marine water and predominantly freshwater. We request further information on whether the estimates be accepted wholesale or whether the boundaries be drawn to favor fresh or marine waters (*i.e.* will the estimates be revised to either make the freshwater or marine water area larger?) Additionally, will the maps change if the definitions of "predominantly marine waters" and "predominantly fresh waters" in 62-303 F.A.C. are adopted as part of the Triennial Review? If so, how will they be affected?

c. Numeric Nutrient Criteria Should Be Revisited and Improved

Healthy Gulf (formerly Gulf Restoration Network) raised concerns and still object to the current NNC in Florida. We take this opportunity to suggest that FDEP reconsider the existing NNC. The criteria focus on how to identify a polluted waterbody once it is already polluted. The purpose of criteria should be to prevent pollution, not just notify the state after a waterbody is polluted. Additionally, Florida's NNC should be reconsidered because the use of annual averages and geometric means is inappropriate, downstream uses are not adequately protected, recreation is not considered, and drinking water is not adequately considered.

d. FDEP should adopt the entirety of the EPA Selenium water quality standard, and use the EPA draft Implementation Guidance until such time that the Guidance is finalized and can be adopted.

Selenium is a naturally occurring element that is essential to life in small amounts, but toxic in higher concentrations. In 2016 the EPA published a guidance document with an updated water quality standard recommendation for selenium.[2] The 2016 criterion

> "is a chronic criterion that is composed of four elements. All elements are protective against chronic selenium effects. Two elements are based on the concentration of selenium in fish tissue and two elements are based on the concentration of selenium in the water column. The recommended elements are: (1) a fish egg-ovary element; (2) a fish whole-body and/or muscle element; (3) a water column element (one value for lentic and one value for lotic aquatic systems); and (4) a water column intermittent element to account for potential chronic effects from short-term exposures (one value for lentic and one value for lotic aquatic systems)."[3]

The EPA recommends testing fish tissue to determine the concentration of selenium because bioaccumulation is what actually causes deleterious effects to wildlife, and it cannot be measured by sampling the water column alone.[4]

The current FDEP selenium criterion for marine water is consistent with the current EPA recommendation for selenium in marine water. However, the FDEP selenium criterion for freshwater is less stringent than the current EPA recommendation, so FDEP should adopt the EPA recommendation. FDEP stated a concerned that there are outstanding implementation issues because the EPA has not finalized its Implementation Guidance. There is a published draft of the EPA implementation guidelines. FDEP should use the draft in the interim period between now and when they publish the final version. The EPA's lack of a final implementation guide is not a good enough reason to delay adopting the new, more protective selenium

[2] EPA, Aquatic Life Ambient Water Quality Criterion for Selenium -- Freshwater 2016, 1-807, https://www.epa.gov/sites/production/files/2016-07/documents/aquatic_life_awqc_for_selenium_-_freshwater_2016.pdf (last accessed May, 16, 2019).

[3] *Id.* at xii.

[4] *Id.*

criteria until the next Triennial Review because selenium toxicity causes serious effects on fish species, such as reproductive teratogenesis and larval mortality.[5]

e. Waters listed as impaired for dissolved oxygen (DO) due to natural conditions should not be delisted unless other protections are put in place simultaneously.

FDEP is considering changing the regulations for waters listed as impaired for DO due to natural conditions. While FDEP has supplied some support documents used to determine if waters are not "not highly influenced by anthropogenic inputs,"there is a possibility that it would be abused by parties that want to take advantage of a lower dissolved oxygen standard. Although it is important to ensure resources are not being diverted to these waters instead of truly impaired waters, what protections are these low DO water bodies losing when or if they are delisted or given a weaker numeric standard? Will FDEP explicitly ensure in the regulations that a limited number of permits or TMDLs will be issued for these low DO waters?

Attempts in other Gulf states, such as Louisiana to lower dissolved oxygen standards have not been well supported and have fallen under scrutiny from the public and the courts.[6] The sad fact is that there are few, if any, waters in Florida that do not experience deleterious impacts from anthropogenic sources. These sources can come from point sources, nonpoint runoff, and groundwater flow. We would discourage lowering any dissolved oxygen standards, or delisting waters in Florida, unless it is ensured that there are no significant anthropogenic pollution sources, and no additional sources are allowed.

2. Other recommended changes that are not currently included in FDEP's proposed changes

a. FDEP should adopt the EPA recommendation for Aluminum in freshwater.

The EPA promulgated an updated water quality criteria recommendation for aluminum in 2018. FDEP should adopt the updated standard during this Triennial Review. "Anthropogenic releases [of aluminum] are primarily associated with industrial processes and include air emissions, wastewater effluent and solid waste. Anthropogenic sources include fossil fuel combustion, aluminum production (mining and smelting) and aluminum present in fertilizers used in agriculture."[7] For invertebrates, aluminum toxicity results in a loss of sodium and interferes with salt regulation, which can lead to death for the organisms.[8] "For fish, the gill is the primary site of aluminum toxic action, resulting in ionoregulatory, osmoregulatory and respiratory dysfunction."[9]

b. FDEP should adopt the EPA Recommended Recreational Ambient Water Quality Criteria or Swimming Advisories for two Cyanotoxins, Microcystins and Cylindrospermopsin.

Healthy Gulf is pleased to see that FDEP is considering adopting human health criteria for Microcystins and Cylindrospermopsin. However, we submit that FDEP should adopt the EPA's draft recommendation, as

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[5] *Id.* at 2.
[6] *See e.g. Gulf Restoration Network v. United States Environmental Protection Agency*, 2018 WL 5297743, No. 18-1632 (Rec. Doc. 66 filed February 25, 2019).
[7] EPA, Final Aquatic Life Ambient Water Quality Criteria for Aluminum 2018, 2-3, https://www.epa.gov/sites/production/files/2018-12/documents/aluminum-final-national-recommended-awqc.pdf (last accessed May 29, 2019).
[8] *Id.* at 3.
[9] *Id.*

opposed to its final recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin.[10] These draft criteria limit microcystins to 4 ug/L and cylindrospermopsin to 8 ug/L[11] and are more consistent with other state recreational water cyanotoxin action levels.[12] EPA's final recommended values, on the other hand, are 8 ug/L for microcystins and 15 ug/L for cylindrospermopsin, nearly doubling the draft recommended values.[13]

While the EPA contends that an updated ingestion rate based on a 2017 study was the primary factor for the change in the recommended values, the final recommended values were based only on potential ingestion exposure (based on estimated average pool water ingestion), and not on inhalation, dermal absorption, or from eating contaminating fish or shellfish. Therefore, it assumes that all cyanotoxin exposure is from ingestion.[14]

Exposure can occur through various recreational and non-recreational pathways. Exposure from recreational water sources can occur through incidental ingestion while recreating, contact with the skin during activities like swimming, wading, fishing, boating, kayaking, and surfing, and inhalation as waterborne cyanotoxins are aerosolized.

Further, EPA's final recommended values do not account for the multiple ways in which a person could be exposed to cyanotoxins while recreating. Whereas the draft recommended criteria considered multiple exposure pathways and utilized an 80% relative source contribution (RSC), providing a "margin of safety" for individuals who may be exposed to cyanotoxins from different sources and through different routes,[15] the final recommended values eliminated the RSC and assume all cyanotoxin exposure is from ingestion.[16]

In developing water quality criteria, the state must adequately protect people from both the short-term and long-term effects of cyanotoxins.[17] Short term impacts include gastrointestinal, dermatologic, respiratory, neurologic and other symptoms.[18] Some exposures have resulted in severe respiratory impairment (such as pneumonia and adult respiratory distress syndrome), as well as liver and kidney damage from ingesting contaminated drinking water.[19]

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[10] *See In Re: Petition to Initiate Rulemaking to Establish Water Quality Criteria for Cyanotoxins*, Petition to Initiate Rulemaking to Establish Water Quality Standards for Cyanotoxins in Florida Surface Waters, Center for Biological Diversity, Sanibel-Captiva Conservation Foundation, and Calusa Waterkeeper, OGC Case No. 19-0419, at 113-16 (May 23, 2019).

[11] No more than 10 percent of days in a recreational season (up to one calendar year). EPA. 2016. Memorandum from Joel Beauvais, Deputy Assistant Administrator to State Environmental Commissioners, State Water Directors, "Renewed Call to Action to Reduce Nutrient Pollution and Support for Incremental Actions to Protect Water Quality and Public Health", (Sept. 22, 2016). at 52.

[12] *See* EPA (2016), Appendix B State Recreational Water Guidelines for Cyanotoxins and Cyanobacteria at B-4 (California), B-5 (Colorado), B-9 (Ohio), B-10 (Vermont), B-17 (Virginia).

[13] Not to be exceeded in more than three 10-day assessment periods over the course of a recreational season. EPA (2019) at 76.

[14] U.S. Environmental Protection Agency. 2019. Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin (EPA 2019). at 58.

[15] EPA (2016) at 44.

[16] EPA (2019) at 58.

[17] *See* 33 U.S.C. § 1313(c)(2)(A) (stating that water quality standards shall be such as to protect the public health or welfare, enhance the quality of the water, and serve the purposes of this chapter)

[18] EPA (2016) at 4.

[19] Hillborn, E.D. and V.R. Beasley. 2015. One health and cyanobacteria in freshwater systems: animal illnesses and deaths are sentinel events for human health risks, Toxins, 1374-1395.

There may also be significant long-term impacts from chronic, low-level exposure, including higher incidence of some cancers, non-alchohoic liver disease, Lou Gehrig's disease (amyotrophic lateral sclerosis, or "ALS"), Alzheimer's disease, and Parkinsonism Dementia Complex (ALS/PDC) .[20] [21] [22] [23]

DEP should act immediately upon the Task Force's recommendations, follow the precautionary principle, and expeditiously establish the most protective water quality criteria for microcystins and cylindrospermopsin. These criteria would establish clear numeric baselines and form the basis of water quality monitoring that would provide state environmental and health officials with critical information to notify the public of the health and safety risks of recreating in waters with high cyanotoxin levels.

c. FDEP should adopt water quality criteria for metals that measure dissolved metals in the water body.

The FDEP standards for cadmium, chromium, copper, lead, nickel, silver and zinc are usually measured as total recoverable metal, "unless a dissolved metal translator has been established."[24] In 1993, the EPA published guidance that recognized that a measurement of dissolved metals was a better representation of bioavailability because that is what is absorbed by fish.[25] As a result of this guidance, the EPA recommendations are always measured as dissolved metals rather than recoverable metals.[26] FDEP should update its water quality standards for the hardness-dependent criteria to reflect the EPA recommendations. Namely, FDEP should always measure dissolved metals, because the current FDEP standards are not accurate representations of how polluted the water bodies are.

b. FDEP should update the WQC for copper to reflect the EPA recommendations for both freshwater and marine water.

Copper is a necessary micronutrient for virtually all plants and animals, however, copper toxicity can happen at higher concentrations.[27] Anthropogenic sources of environmental contamination by copper include mining, smelting, foundries, municipal waste incinerators, burning of coal for power generation, and a

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[20] Svircev, Z., Lalic, D., Savic, G.B., Tokodi, N., Backovic, D.D., Chen, L., Meriluoto, J., and Codd, G.A. 2019. Global geographical and historical overview of cyanotoxin distribution and cyanobacterial poisonings. Archives of Toxicology. 93(9):2429-2481. https://doi.org/10,1007/s00204-019-02524-4.

[21] Zhang, F, J. Lee, S. Liang, and C.K. Shum. 2015. Cyanobacteria blooms and non-alcoholic liver disease: evidence from a county level ecological study in the United States, Environmental Health, 14:41.

[22] News Medical Life Sciences, Toxic algae may be more harmful for people with pre-existing liver disease, (Sep. 19, 2019), at https://www.news-medical.net/news/20190919/Toxic-algae-may-be-more-harmful-for-people-with-pre-existing-liver-disease.aspx; Lad, A. et al. 2019. Chronic low dose oral exposure to microcystin-LR exacerbates hepatic injury in a murine model of non-alcoholic fatty liver disease. Toxins. Doi.org/10.3390/toxins11090486.

[23] Banack, S.A. et al. 2010. The Cyanobacteria Derived Toxin Beta-N-Methylamino-L-Alanine and Amyotrophic Lateral Sclerosis, Toxins 2010, 2, 2837-2850; Bienfang P.K. et al. 2011. Prominent Implications. International Journal of Microbiology. Vol. 2011. Article ID 152815.

[24] 62-302.500(2)(d), F.A.C..

[25] EPA, The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion, ii, https://www3.epa.gov/npdes/pubs/metals_translator.pdf (last accessed May, 20, 2019). *See also,* EPA, Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria, 2, https://www.epa.gov/sites/production/files/2015-01/documents/metals-criteria-interpret-aqlife.pdf (last accessed May 22, 2019).

[26] EPA, National Recommended Water Quality Criteria - Aquatic Life Criteria Table, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table#main-content (last accessed May 17, 2019). *See also,* 65 FR 66443.

[27] EPA, Aquatic Life Ambient Freshwater Quality Criteria--Copper, 2007 Revision, 1, https://www.epa.gov/sites/production/files/2019-02/documents/al-freshwater-copper-2007-revision.pdf (last accessed May 20, 2019).

variety of copper-based products used in building and construction, in electrical/ electronic equipment and in other industries such as agriculture.[28] The mode of copper toxicity is species-dependent.[29] "In bacteria, fungi and algae, excess copper causes disruption of cell membrane integrity and the subsequent leakage of the cell contents."[30] In mollusks, copper toxicity interferes with the function of membranes and cells.[31] In mussels and crabs, elevated levels of copper disrupt gill function.[32] "In marine fish, copper adversely affects osmoregulatory processes, ATP-synthesizing pathways and ion transport across the gills, and causes oxidative stress damage."[33] The FDEP and EPA have different standards for copper toxicity in marine water. The EPA recommended criteria for copper in marine water is 4.8µg/L for acute exposure and 3.1µg/L for chronic exposure. The FDEP standard is 3.7µg/L for Class II and Class III (predominantly marine water,) and 500µg/L for Class IV and Class V. The elevated standard for Classes IV and V may be a result of agricultural and maritime industries' reliance on copper-based herbicides, pesticides and ship antifouling agents, however, to better protect fish and wildlife, FDEP should adopt the more protective EPA recommendation.

In the past, EPA used a hardness-dependent function to calculate the criteria for copper toxicity in freshwater. However, the EPA changed its recommendation and now uses a Biotic Ligand Model (a bioavailability modelling approach.)[34] The FDEP still uses a hardness-dependent function.[35] As a result of the differing methods, it is not clear how the EPA and FDEP criteria for copper compare. We request that FDEP adopt the Biotic Ligand Model recommended by the EPA or provide adequate scientific justification for its decision to continue using the hardness-dependent function, including evidence that it remains consistent with the CWA.

c. FDEP should update the WQC for Parathion to reflect the most recent EPA recommendations.

Parathion is primarily used as an insecticide on fruit, cotton, wheat, vegetable and nut crops.[36] It appears that the FDEP standard for parathion is based on the EPA's 1986 standard, which can still be found in the Quality Criteria for Water 1986 "Gold Book."[37] The EPA updated its water quality criterion for parathion in 1995.[38] As a result, the EPA's standard is more strict than FDEP's current standard. FDEP should update its criterion for parathion to the most updated EPA recommendation.

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[28] Cyrino de Oliveira-Filho, Eduardo, et al., Comparative study on the susceptibility of freshwater species to copper-based pesticides, Chemosphere 56 (2004) 369–374, 370.
[29] EPA, Draft Aquatic Life Ambient Estuarine/Marine Water Quality Criteria for Copper - 2016, 14, https://www.epa.gov/sites/production/files/2017-02/documents/copper-estuarine-marine-draft-document.pdf (last accessed May 20, 2019).
[30] *Id.*
[31] *Id.*
[32] *Id.* at 14-15.
[33] *Id.* at 15.
[34] EPA, Aquatic Life Ambient Freshwater Quality Criteria-Copper 2007, 1, https://www.epa.gov/sites/production/files/2019-02/documents/al-freshwater-copper-2007-revision.pdf (last accessed May 17, 2019).
[35] 62-302.530 F.A.C..
[36] EPA, Parathion, 1, https://www.epa.gov/sites/production/files/2016-09/documents/parathion.pdf (last accessed May 16, 2019).
[37]EPA, Quality Criteria for Water 1986 "The Gold Book," 226, https://www.epa.gov/sites/production/files/2018-10/documents/quality-criteria-water-1986.pdf (last accessed May 16, 2019).
[38] EPA, National Recommended Water Quality Criteria - Aquatic Life Criteria Table, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table#main-content (last accessed May 15, 2019). *See also,* 65 FR 66443.

d. FDEP should adopt a WQC for Acrolein

The Recommended Ambient Aquatic Life Water Quality Criterion for acrolein was published on July 1, 2009 by the EPA.[39] Acrolein "is used directly as a biocide for aquatic weed control."[40] Acrolein causes cell wall degradation and disrupts cells' "ability to inactivate toxic chemicals."[41] FDEP does not currently have a water quality criterion for acrolein and should should adopt the EPA recommended water quality criterion, or provide a statement explaining why FDEP has not yet adopted a criterion for this pollutant.

e. FDEP should adopt a WQC for Tributyltin

Tributyltin (TBT) is an antifouling agent that is used in paint to protect the hulls of large ships. In 1988, the United States banned the use of TBT on ships under twenty five meters; however, that law was repealed in 2010.[42] The EPA published its recommended WQC for TBT in 2004.[43] Antifouling paints containing organotin compounds, such as TBT, with an acceptable release rate ($4.0 \mu g/cm^2$)[44] are restricted-use pesticides in Florida and may only be sold, distributed, and used in the state by licensed dealers and applicators.[45] There are several hundred dealers and applicators of TBT antifouling paints in Florida, Alabama and Georgia.[46] The use of TBT in Alabama and Georgia may have a detrimental effect on Florida water bodies and should have a WQC so that the levels of this pollutant can be monitored further. FDEP does not currently have a water quality criterion for TBT and should should adopt the EPA recommended WQC, or provide a statement explaining why FDEP has not yet adopted a criterion for this pollutant.

f. FDEP should update its WQC for chlorides to reflect the EPA recommendations for human health and aquatic life.

"The major anthropogenic sources of chloride in surface waters are deicing salt, urban and agricultural runoff, and discharges from municipal wastewater plants, industrial plants, and the drilling of oil and gas wells."[47] Although the EPA updated its National Recommended Water Quality Criteria for Human Health for Chlorides in 2015,[48] the EPA first developed its WQC for Aquatic Life for chlorides in 1988 and has not updated it since.[49] FDEP officials stated at the May 14, 2019 "kick-off" hearing that this year's Triennial Review will not include changes to the human health criteria because they are waiting for the results of

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[39] EPA, Ambient Aquatic Life Criteria for Acrolein, https://www.epa.gov/sites/production/files/2018-12/documents/ambient-wqc-acrolein.pdf (last accessed May 16, 2019).

[40] *Id.* at 1.

[41] *Id.* at 4.

[42] 33 U.S.C. § 2403(a) (repealed October 15, 2010).

[43] EPA, Ambient Aquatic Life Water Quality Criteria for Tributyltin (TBT), https://www.epa.gov/sites/production/files/2019-02/documents/ambient-wqc-tributyltin-final.pdf (last accessed May 17, 2019).

[44] F.S. § 487.021(1).

[45] F.S. § 487.171(3).

[46] *See e.g.,* Sea Hawk Premium Yacht Finishes, Locate a Certified Applicator, https://www.seahawkpaints.com/locate-a-certified-applicator/ (last accessed May 21, 2019).

[47] EPA, Ambient Water Quality Criteria for Chloride--1988, 8, https://www.epa.gov/sites/production/files/2018-08/documents/chloride-aquatic-life-criteria-1988.pdf (last accessed May 16, 2019).

[48] EPA, National Recommended Water Quality Criteria--Human Health Criteria Table, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table (last accessed May 20, 2019).

[49] EPA, Ambient Water Quality Criteria for Chloride--1988, https://www.epa.gov/sites/production/files/2018-08/documents/chloride-aquatic-life-criteria-1988.pdf (last accessed May 16, 2019).

surveys that are currently in progress. The 2019 Triennial Review will instead only include revisions to the water quality standards for Aquatic Life. In its recommendation, the EPA recognized that its National Criterion for chlorides, 230mg/L, would not be adequately protective of aquatic life "when the chloride is associated with potassium, calcium, or magnesium, rather than sodium."[50] In contrast, FDEP's criterion is for chlorides is less stringent at ≤250mg/L. FDEP should adopt the EPA recommendation for chlorides. Alternatively, we request that FDEP provide more information, or any data it relied on to determine that the ≤250mg/L standard would adequately protect Florida's freshwater aquatic life and human health.

g. FDEP should adopt a WQC for Heptachlor Epoxide

Heptachlor epoxide is a metabolite that occurs when heptachlor is exposed to oxygen.[51] Because heptachlor readily oxidizes under normal environmental conditions, heptachlor and heptachlor epoxide are often grouped together as one reference in scientific studies.[52] "The acute toxicity of heptachlor in animals is associated with central nervous system disturbances, such as hyperexcitability, tremors, convulsions, and paralysis. The acute toxicity of heptachlor epoxide is greater than that of heptachlor, whereas that of the other metabolites is much less."[53] There is no FDEP standard for heptachlor epoxide. FDEP should adopt the EPA recommended WQC for heptachlor epoxide.

h. FDEP should adopt a WQC for Hydrogen Sulfide

"Sulfides are constituents of many industrial wastes such as those from tanneries, paper mills, chemical plants, and gas works. The anaerobic decomposition of sewage, sludge beds, algae, and other naturally deposited organic material is a major source of hydrogen sulfide."[54] Waters polluted with hydrogen sulfide exhibit increased fish egg and fry mortality.[55] FDEP should adopt the EPA recommended WQC for hydrogen sulfide.

Thank you for the opportunity to comment on the Florida Triennial Review. We look forward to your responses.

For a healthy Gulf,

Matt Rota
Senior Policy Director

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[50] *Id.* at 8.
[51] World Health Organization (WHO), Concise International Chemical Assessment Document 70 Heptachlor (2006), 1-74, 4, https://www.who.int/ipcs/publications/cicad/cicad70.pdf (last accessed May 21, 2019).
[52] *See id.*
[53] *Id.*
[54] EPA, Quality Criteria for Water 1986 "The Gold Book," 273, https://www.epa.gov/sites/production/files/2018-10/documents/quality-criteria-water-1986.pdf (last accessed May 16, 2019).
[55] *Id.* at 275.

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