Summary of Public Comments and Department of Environmental Quality (DEQ) Responses
Regarding Proposed Rules for Part 201, Environmental Remediation,
of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (the Act)
for the Public Comment Period Ending September 13, 2016

Key to Commenters:

AATWP = Ann Arbor Charter Township Supervisor
AECOM = AECOM
AMECFW = AMEC Foster Wheeler, Environment & Infrastructure
ANNARBOR = City of Ann Arbor, Mayor's Office
API = American Petroleum Industries of Michigan
ARCADIS = Arcadis U.S., Inc.
BARR = Barr Engineering – Steve Crider
BENSON = Patricia Benson
CARUSO = Rita Loch-Caruso
CHAMBER – Michigan Chamber of Commerce
CITIZENS = Anita Daley, Susan Cameron, John Herbst, Ann Marie Jensen, Aimee Jones, Suzanne Marcus, Caron Valentine-Marsh, Katherine Pearson, Martin Sager, Colleen Seifert, Michelle Steiner, Kate Wright, Judy Yu
CONSUMERS = Consumers Energy
DIOXANE = Amanda Bergren, Stephen C Brown, Rose Carmela, Ashley Dickerson, Sean Eldon, Laura Eliason, Patrice Flower, Jacob Graham, David Haig, Jeff Hunsinger, Scott Iekel-Johnson, Frederick Juckniess, Pam Kirchen, Ed Korczynski, Daniel Parnell McCarter, Elly McCue, Jill McGinn, Shana Milkie, Rita Mitchell, Jeffery Pearson, Jennifer Schlicht, Leslie Sobel, Ann Tsentsiper
DOW = The Dow Chemical Company
ECOLOGY = Ecology Center
ECT = Environmental Consulting & Technology, Inc. – Merit Energy Company
GES = Groundwater & Environmental Services, Inc.
GLELC = Great Lakes Environmental Law Center
GM = General Motors
GOLDER = Golder Associates
HALEY = Haley & Aldrich, Inc.
INNES = Steven Innes, NTH Consultants
HRWC = Huron River Watershed Council
IRWIN = Jeff Irwin, State Representative, 53rd District
KAYLOR = Donald C. Kaylor, Testing Engineers & Consultants Inc.
KCHD = Kent County Health Department
KOMAN = Patricia Koman
KUHN = Kuhn Rogers PLC
LAM = Tina Lam
LESHER = Megan Lesher
LONETREE – Lone Tree Council
MCC = Michigan Chemical Council
MDHHS = Chief Medical Executive, Dr. Eden Wells
MDHHS-DEH = Michigan Department of Health and Human Services-Division of Environmental Health
MEC = Michigan Environmental Council
MEGA = Michigan Electric and Gas Association
MMA= Michigan Manufacturers Association
MOGA = Michigan Oil and Gas Association
MOHR = Thomas K. G. Mohr, P.G., H.G., Mohr HydroGeoScience
MPA/MACS = Michigan Petroleum Association and Michigan Association of Convenience Stores
PM = PM Environmental
SONS = Dave Sons
SRSW = Scio Residents for Safe Water
STONE = Judy Stone
UBANK = University Bank, Ann Arbor
WCDPW = Washtenaw County Director of Public Works, Water Resources Commissioner
WCPH = Washtenaw County Public Health
WEC = WEC Energy Group
ZAYKO = Stephen Zayko, PM Environmental, Inc

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
Overall		ANNARBOR	These criteria are an important part of protecting public health safety and welfare in addition to adding certainty to the remediation, closure and redevelopment of contaminated sites across the state. It is imperative that these criteria be promulgated and begun to be used across the state. The City recommends that the DEQ promulgate the proposed rule package as proposed (or with minor revisions) to insure that new rules are promulgated this year. The City is pleased that city staff were able to participate and represent the broader public interest as part of the CSA group process. Through this process, the CSA developed a clear hierarchy of toxicological data sets to be used by the DEQ as inputs to develop new criteria. This hierarchy better ensures that the best available science is used. The City agrees with the CSA recommendation that USEPA's IRIS be used when data are available. The City also agrees that the DEQ should evaluate whether IRIS is the best available data and DEQ should choose an appropriate input value using its best professional judgment. In these cases, the DEQ must be transparent when these choices are made and must justify the rationale in choosing an input different from IRIS. The City also applauds the members of the regulated community participating in the CSA process. These participants have raised valid concerns about how these criteria affect the regulated community, have supported the use of best science, and have recognized the need to update the criteria including adding a child receptor to the exposure assumptions. The CSA recommended that the DEQ include a child receptor as part of their consideration in developing new generic cleanup criteria. The use of a child receptor takes a more conservative approach in developing new cleanup criteria. The City supports this recommendation from the CSA and its inclusion in the new rules. The City supports the DEQ developing a more nimble approach to updating generic clean up criteria. To that end, the City would prefer to see the hierarchy and the	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. The DEQ concurs with the commenter that it should evaluate whether IRIS is the best available toxicity information and should determine the appropriate value. This approach is consistent with how the DEQ implemented the CSA recommendation 1.1. The DEQ concurs that there should be a more nimble approach to updating cleanup criteria. The DEQ supports an approach similar to the AQD rule 230 process and will pursue including a similar process in future rule revisions.	None

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			algorithm promulgated in the rules without the table of values. This would allow the DEQ to recognize new, best available science and use these data to generate new cleanup criteria through an open and transparent process. The DEQ would publish a new table of values on an annual basis when updates are made. Similarly, the City recommends that the DEQ develop a process whereby the regulated community, local governments, NGOs, and the public can petition the DEQ to review clean up criteria when new science is available or the science on which the criteria is based comes into question. The number of petitions should be capped to ensure that the DEQ is not overwhelmed by the number of criteria up for review in any given year. The DEQ has attempted to update these criteria several times over the past five years, but it has been several years since these criteria have been updated and there is a significant amount of new, best available science that needs to be reflected in the DEQ cleanup criteria. For example, USEPA's IRIS process developed new toxicology data for 1,4 Dioxane in 2010, yet the DEQ has not updated the state standards to reflect this new information until, finally, the currently proposed cleanup criteria. This is true for many of the other 303 chemicals under review. The process for updating criteria is flawed and needs to be updated so that new science can be rapidly incorporated into criteria. As a participant in this CSA process, the City recognizes that the process is not complete and that significant concerns remain within the regulated community around a few key pieces of the rules including the use of draft IRIS values, vapor intrusion, and key exposure assumptions. However, the City supports promulgation of the proposed rule package as proposed (or with minor revisions), and commits to continue to support the CSA process to work through remaining concerns from the regulated community within the next year.		

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Overall		AATWP	These standards should be approved because they more closely reflect the best available science. As a result, the proposed standards will do a better job of protecting public health from environmental hazards. While the proposed standard for 1-4 dioxane is an improvement on the current standard, it is still far too high to meet the DEQ's responsibility to protect the public from cancers and other health problems. The lifetime exposure threshold of 30 years is 50% longer than the USEPA's 20-year assumption, and the child exposure factor is too low, underestimating the impact of cancerous substances on small humans. The DEQ should have adopted these standards in 2013, when the USEPA adopted standards that are lower and thus more protective of human health. Michigan law requires cleanup criteria using the best available science to protect the public health. Our current standards, especially those for 1,4 dioxane, are based on old studies that underestimate the danger from chemical exposures. The 85 ppb dioxane standard has failed families who were told their well water was safe for them and their young children, simply because Michigan has been slow to update our cleanup criteria. And it has failed our community as a whole as for more than 20 years, we have watched dioxane spread towards our main municipal water supply without effective deterrent action by DEQ. There is some indication that the pollution plume is moving in a northward direction, toward Barton Pond, the source of drinking water for the City of Ann Arbor and Ann Arbor Township and other communities in the area. A shut down of that supply line would leave many residents without a source of safe drinking water. We have known for years that dioxane is more dangerous than previously believed. In communities like Ann Arbor Township, where pollution has been allowed to spread because of inaction and outdated assumptions, these new standards are a critical first step to protecting public health. Please adopt these new standards and then move promptly to improving exposure assumptions to bring our standards in line with the nation and majority of states.	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints.	None

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Overall		UBANK	Our town faces the possibility of ending up without safe drinking water due to the spread of the toxic Pall Plume under our city. The DEQ's efforts to date are insufficient to protect the citizens of Ann Arbor. We strongly support the proposed lower 1,4-Dioxane standards as proposed and frankly, feel they do not go far enough to meet the requirement of the law to protect the public using the best scientific evidence available because they do not protect small children or long term residents sufficiently. A lower standard should be set along the lines proposed by State Representative Jeff Irwin and others who have commented to you earlier in the process. Ann Arbor is totally dependent upon Barton Pond for its water. Without it, the current water treatment plant would be unable to operate. There are inadequate monitoring wells between the existing spreading Pall Plume and Barton Pond, so we could literally wake up one day and discover that our sole water source is poisoned. If the DEQ does not act, Ann Arbor could literally wake up one day without a drinking water source. Because there is no contingency plan in place to provide water from an alternative source other than the Detroit Water System, and there is no limit on the price that could be charged for its daily water supply, the city of Ann Arbor would face a huge increase in water costs during the multi-year period of time it would take to complete a pipeline and provide an alternative source of water upstream from the current water source at Barton Pond. This would place an undue burden on the citizens of Ann Arbor and cause a rise in foreclosures among citizens on fixed incomes. This is an existential threat to our city's future. Without the stricter standard in place the current inadequate clean-up cannot be challenged in court. If the proposed standard or a stricter one is established, I urge you to expeditiously seek legal action against the Pall Corporation to have the court impose an effective clean-up of the Pall Plume, so that it does not continue to spread and threaten our city's future.	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints.	None

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Overall		BENSON	I am a founding member and ongoing board member of Scio Residents for Safe Water (SRSW) and support the comments submitted by Roger Rayle on behalf of SRSW. I have long been involved in advocating for a safe, scientifically sound and protective cleanup of the 1,4-dioxane contaminated groundwater in our local communities. As Honey Creek runs through my backyard, I became active in 1993 when discharge of treated groundwater was being planned. I attended the public hearing in 1995 prior to the changes that occurred in cleanup standards for toxic substances. These changes did not occur because any new information was learned about the public health risks of toxic materials. The weakening of standards and increased risks to state residents that occurred was unacceptable. Now, six years since the USEPA issued new scientific findings that indicated 1,4-dioxane poses greater cancer risks than previously believed, I remain hopeful that the state will adopt the proposed exposure criteria yet this year. I strongly support the proposed 7.2 ppb cleanup standard for 1,4-dioxane. While this remains higher than the 3 ppb standard in place prior to the 1995 changes, and is higher than standards that other states use, it is a step in the right direction. Michigan residents deserve efficient adoption of these changes.	Comments received.	None
Overall		CARUSO	I have been actively following the Part 201 Generic Cleanup Criteria Proposed Rules Revisions and am taking this opportunity to provide comments as part of the public comment process. I am a citizen of Ann Arbor for over 30 years, an active charter member of the citizen/government group Coalition for Action on Remediation of Dioxane (CARD), and a Professor of Toxicology at the University of Michigan School of Public Health. I participated in three meetings of the DEQ-organized Criteria Stakeholders Group in 2013. The proposed revisions will improve protection of public health, safety, and welfare, and the environment compared with the current, outdated rules. In particular, I applaud the inclusion of children, pregnant women, and	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. The DEQ concurs that there should be a more	None

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			the unborn in risk analyses of chemical contaminants for residences: recent scientific findings emphasize special vulnerabilities of the unborn and very young to numerous environmental contaminants, including findings of transgenerational impacts on several chronic diseases. Likewise, inclusion of vapor intrusion in exposure estimates is a significant addition for protection of public health. As a citizen of Ann Arbor and CARD member, I also applaud updating the drinking water cleanup criterion for 1,4-dioxane to the more protective value of 7.2 ppb. Thank you for adding these new protections. However, several concerns remain with the proposed revisions that I hope can be addressed. First, I urge universal adoption of a process that allows updating of the criteria values using models/equations that allow input of new scientific data as they become available without requiring legislation to adopt a change of value. When rigid values are set instead, then the rules fail to keep up with scientific advances, as in the current situation. Second, I urge the DEQ to abandon its position that 32 years constitutes a lifetime exposure, considering that the USEPA uses 70 years and has even indicated that this may need to be revised upwards with increased longevity of the US population. Third, while the proposed standard for 1,4-dioxane is an improvement on the current standard, it is still too high to meet the State of Michigan's responsibility to protect the public from cancers and other health problems, seeming to ignore extensive analyses of 1,4-dioxane threats to people and the environment by the USEPA and CDC/ATSDR. Fourth, I urge the DEQ to adopt a more transparent and inclusive approach in actions that affect the public health. In the DEQ-organized Criteria Stakeholders Group meetings that I participated in, private industry (repeatedly referred to in the meetings as the "regulated community") was over-represented.	nimble approach to updating cleanup criteria. The DEQ supports an approach similar to the AQD rule 230 process and will pursue including a similar process in future rule revisions.	

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Overall		CITIZENS	I am writing to express my support of Michigan's Generic Cleanup Criteria Rules Revisions. This criteria is long overdue. In the interest of public health, I urge you to adopt the criteria. Please put the health needs of the people of this state first.	Comments received.	None
Overall		DIOXANE	Please adopt new rules that will bring the cleanup standard for 1,4-dioxane from 85 ppb to 7.2 ppb. Current rules fail to protect public health, and adoption of these rules is imperative. Please protect us. This is higher than the original cleanup standard but still substantially better than the absurb 85 ppb. The state's environmental rules relating to Dioxane must be updated to reflect the most recent science and reduced. The 7.2ppb standard is already a compromise standard and should be adopted without delay. It is long-overdue for the dioxane plume to be dealt with, and this long-delayed update is a necessary step in that process. While the proposed clean-up standards is a step in the right direction, we need a more stringent standard than 7.2 ppb. The standard used to be 3 ppb before the standards was loosened. Also, I want to encourage you to make this process quick despite the fact that some in the industry want it to slow down. It is absolutely essential that this clean-up finishes before the plume reaches the Huron River. I live above the Gelman 1, 4-dioxane plume in Ann Arbor and would like the state government to ensure it is immediately handled in accordance to modern standards. Standards for 1, 4 dioxane are out-of-date and represent a health crisis to the citizens of Ann Arbor. In the wake of the Flint water crisis, the eyes of the nation are currently watching the DEQ and its stewardship of Michigan's water and citizen health – make the right choice and pass the revisions. I'm an Ann Arbor resident who lives near the Gelman Dioxane Plume. In 2010, a test well was installed across form our home off Miller Avenue. My 5 yr old and 3 yr old should not have to grow up in a state or community where corporate polluters profit at the same time that	Comments received.	None

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			people are put in harm's way. I live off Wagner Rd and have well water. My home is in an area being tested for dioxane. Please lower the acceptable limits to help protect people currently living with the threat of dioxane in our well water. I would like to see Michigan's water standards reflect the federal standards. I do not understand why Michigan has been delaying an update to the standards for dioxane and 300-plus other chemicals to reflect current science. Please act to bring 1, 4-dioxanecleanup standards in compliance with CDC and USEPA standards. Dioxane is dangerous and our water should be safe. Please lower the level to protect public health. Please immediately adopt new rules that will bring the cleanup standard for 1,4-dioxane from 85ppb to 7.2ppb. Our water needs to be cleaned up and this is the way to start. The current rules fail to protect public health, the DEQ should adopt these new rules. DEQ should lead from past mistakes and protect the most vulnerable people with $5000 in the bank and lives to lose. Not companies with $50 million in the bank and no lives hanging in the balance. I was scared to mix my babies formula with well water. I bought water for 2 years to mitigate my family's risk. Higher standards of cleanup are needed so that we can move toward establishing a more aggressive cleanup process that could save us from having to connect to the Detroit water system for our fresh water. Please act now, to avoid another disaster such as that currently experienced by the people of Flint. If Ann Arbor loses its fresh water, the state of Michigan will lose our city as an important resource for cultural, educational, and economic benefits. I live in Ann Arbor, close to the Gelman dioxane plume, I don't want to see my community neglected like Flint was and continues to be. Our state has been deliberating changes to the criteria for years. It is past time to actually do something. I understand that there are legitimate concerns with some technical details of the calculations.		

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			However, the underlying need for revisions supersedes this minor problem that can easily be fixed after adoption of the criteria. As an Ann Arbor resident, I am growing increasingly concerned with the continuing spread of the Gellman dioxane plume and the ineffectiveness of the cleanup efforts. We have already had at least one family poisoned in the last year and that number is only going to grow. If this plume reached Barton pond, our drinking water supply, it would be a disaster! There is ample scientific studies and existing regulatory action from other agencies that all agree that the current standard is far above the levels that can cause cancer or other problems. We needed a much lower standard years ago. Please do not delay further and put a new, rigorous standard in place to protect our community before it is too late! I have lived in Ann Arbor 40+ years. The issue of the dioxane cleanup has being argued about, discussed, and postponed for over 30 years. As the dioxane plume spreads this is another Flint waiting to happen. In the interest of public health, and MY health, I urge the DEQ to IMMEDIATELY adopt the draft Michigan's Generic Cleanup Criteria Proposed Rules Revisions. No more postponements, please. I am writing to express my support of Michigan's Generic Cleanup Criteria Proposed Rules Revisions. I urge you to adopt the criteria. I hope we don't have to wait until the city's water supply is contaminated before any action is taken. I used to walk my dog near the old Gelman facility, where dioxane has even been detected in the surface water. Every time I walked him there, he became physically ill. After I made the connection between the location and his health, I stopped taking him there. I feel sorry for the people who live near Dolph park where this issue is the worst. As reported by MLive, "The revised rules being proposed still show dioxane-contaminated groundwater would be allowed to travel through Ann Arbor to the Huron River at levels up to 2,800 ppb — the same as now — ..." is an utterly unjustified gift to Danaher Corp at the expense of		

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			the long-term health of Ann Arbor area residents. Danaher Corp generates >US$2B profit each year these days and can certainly afford to pay to upgrade the remediation equipment before discharging it into the creek which flows to the Huron river. We live a few blocks south of Eberwhite woods, so the underground dioxane plume is near our house. Work for all citizens of Michigan, not just those who own corporations. Please do the right thing and protect the water quality in Ann Arbor and surrounding areas and lower the amount of dioxane that is permitted in ground water from 85 parts per billion to 7.2 ppb or lower. Water is essential to life. Please help protect the water supply for the people of Ann Arbor instead of helping protect the polluters. The dioxane plume continues to spread every year. Please make Danaher Corp do more to clean up the plume that they acquired. There is no reason that the plume needs to reach the Huron River before we take action. Please let's take a preventative approach to protect our river. If I am correct the USEPA says that the amount of dioxane that is permitted in drinking water is 3ppb, it seems counter productive if in Michigan we chose to previously ignore the USEPA guideline and suggest that 85ppb is safe. Let's please make the right choice and think about the safety of our drinking water. The law says that pollution cleanup criteria must be based on best available science. Since December of 2013 our cleanup rules have been out of compliance because the DEQ isn't using the updated science in their rules for 1, 4-dioxane. Please stop wasting taxpayer dollars to drag this on further. A lawsuit forcing compliance will only cost more! Please hold ALL water to the same proposed standard, 7.2ppb, as that water might become residential drinking water in the future.		

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Overall		HRWC	This criteria is long overdue. In the interest of public health, I urge you to adopt the criteria. The Huron River Watershed Council (HRWC), the oldest watershed council in Michigan, works to protect and restore the watershed for healthy and vibrant communities. The proposed rule revisions, specifically the 1-4 dioxane criteria, will help protect and restore clean water and a healthy Huron River. It is important to note that these revisions are long overdue. The State Legislature voted to complete these revisions by December 31, 2013. This and subsequent "new deadlines" have been missed, and 2 consecutive mayors of Ann Arbor have been promised these regulations would be changed by multiple "dates certain" that have passed us by. Please adopt these public health regulations which are based on the best science agreed upon throughout the stakeholder engagement process.	Comments received.	None
Overall		IRWIN	*9-9-2016*: These standards should be approved because they more closely reflect the best available science. As a result, the proposed standards will do a better job of protecting public health from environmental standards. However, the proposed standards would do an even better job of protecting the public from cancers and other health problems if the exposure assumptions were improved. Specifically the lifetime exposure threshold of 30 years Is 50% longer than USEPA's 20-year assumption, and the child exposure factor is too low, underestimating the impact of cancerous substances on small humans. Michigan law requires cleanup criteria to use best available science to protect public health. Our current standards, especially those for 1,4-dioxane, are based on old studies that underestimate the danger from chemical exposures. The 85 ppb dioxane standard has failed families like the Pates, who were told their well water was safe for them and their three young children at 50 ppb, simply because Michigan has been slow to update our cleanup criteria. And it has failed our community as a whole, as we have watched dioxane spread towards our main municipal water supply. Already, Ann Arbor has	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints.	None

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			been forced to close a municipal well because cleanup of the aquifer could not be mandated to safe levels under the current standard. Now we know that dioxane is more dangerous than previously believed. In communities like mine, where pollution has been allowed to remain and spread based on outdated assumptions, these new standards are critical to protecting public health. Please adopt these new standards and then consider improving exposure assumptions to bring our standards in line with the nation and majority of the states. *10-18-2016 Additional comments*: The DEQ had been urged on numerous occasions to use readily available scientific information to strengthen the cleanup criteria and protect public health. Research continues to indicate that dioxane is more dangerous than previously believed. Please immediately adopt these new standards and then consider improving exposure assumptions to bring our standards in line with the nation and majority of states.		
Overall		LAM	I am writing in regards to the revisions to Michigan's standards for exposure to certain chemicals, including dioxane. My remarks specifically target the proposed new standard for dioxane. I live in a neighborhood in Scio Township, just outside Ann Arbor, which is among the most threatened by the Gelman-Pall dioxane plume. My well was tested by DEQ two years ago for dioxane, one of perhaps 100 wells potentially threatened by the plume. The results were given to me as "none detected." I was relieved, until I attended a community meeting earlier this year and discovered that what that really meant was that my well's water was below the current standard for dioxane, which many scientists say is too high. I thought I had no dioxane in my well; in fact, there may be dioxane there at a level considered unsafe in many places other than Michigan. It could have been there for years. (We have owned our home since 1998). I feel both misled and unsafe. Should our neighborhood wells (we are all on wells) become contaminated, we would have nowhere to turn. The city of Ann Arbor's drinking water might become	Comments received.	None

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			contaminated with its own segment of the plume, so my neighbors and I could not safely hook up to that water source, which in any case would be prohibitively expensive. Besides the well that supplies our home, where we could unknowingly now be ingesting unsafe levels of dioxane, we own a swimming pool, as do others in the neighborhood. That means we could be exposed by breathing in dioxane or getting it through our skin. I would urge the DEQ and the legislature to approve the new, lower dioxane standard to bring Michigan more in line with international scientific thinking on dioxane and to protect people like me. If the standard is lowered to 7 ppb, at least the next time my well is tested I would feel more confident that my family and I were getting more realistic information on how much dioxane we might be exposed to. The current standard is unscientific, outdated, and does not protect us at all. Do not let Scio Township become another Flint, with science and due diligence ignored for too long.		
Overall		LESHER	It is unconscionable to put economic concerns over health concerns, when it comes to drinking water supplies. We don't need any more debacles like Flint's crisis. Gelman Sciences tainted the groundwater supply in Ann Arbor, with dioxane from that source now creeping toward Barton Pond, the main water supply for that city. I have an acquaintance who lives near the old Gelman Sciences site. She has a well. She can't drink the water, and she doesn't shower at her house. She calls friends, who are on the main water supply for Ann Arbor, and asks to use their showers, to avoid the dioxane. That's bad. I recently moved. Now, my drinking water supply comes from Detroit. Much of its supply comes from watersheds that run through areas that were highly contaminated by industry, to whit, River Rouge, which was so polluted, that in 1969, it caught fire. I won't drink water from the faucet, although, I did, initially. I got very sick, for a week, with diarrhea. I live alone, and it took several days, after moving, to accumulate enough dishes to run the dishwasher. I was	Comment received.	None

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			appalled, to see that some stainless steel utensils I put in that wash rusted. I'd used the same dishwasher detergent, to wash the same utensils, many times previously, with no rust forming on them. As soon as I started drinking only bottled water, my health started improving, and soon, that bout with diarrhea stopped. But that was a bad week. I can't claim that tap water pollutants caused that illness. But I suspect it. For too long, industries have been dumping contaminated water into watersheds. It's high time that legislation is enacted to put rigid controls in place. The science exists to do this. This is a 'not in my back yard' issue. No one wants to drink bad water, as the Sioux and the people of Flint will attest to. In the past, the earth was able to filter chemicals better. But the earth can't do this, indefinitely. The concentrations accumulate and water is a great carrier. We drink tainted water, and it gets into our tissues. No one is immune from these effects, as the hydrocephalic babies in Flint demonstrate. We don't need Zika. Humankind is doing as good a job, and we should know better, much better. Avarice is behind much ill in this world. Water is an absolute necessity. Let's clean it up, and keep it clean.		
Overall		SRSW	SRSW supports the proposed 7.2 ppb cleanup standard for 1,4-dioxane... even though it is still weaker than the 3.5 ppb and 0.35 ppb standards that other states use. It would be better if Michigan lead the way on water protection since it is steward to ~1/5 of the world's fresh surface water... surface water that actually defines the shape of Michigan. It's tragic that the dioxane standard was loosened from 3 ppb to 77 ppb basically overnight (when Michigan went from a 1-in-1,000,000 risk basis to 1-in-100,000) in 1995 and to 85 ppb a few years later. It's also tragic that the DEQ is taking more than 6 years to partially adhere to the 2010 USEPA guidelines to tighten dioxane cleanup standards. To further delay the	Comments received.	None

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			implementation of stricter standards for dioxane because of possible objections to other, unrelated compounds would be more seen as more foot dragging by the DEQ. There is no good reason for all standards to be approved and litigated as a group.		
Overall		STONE	Living in Ann Arbor I am acutely aware of the risk of Dioxane contamination, something that has been present in our groundwater for far too many decades (since 1968) without adequate remediation. The lack of regulatory teeth allowed almost twenty years to go by with no action. We now face a far more serious risk of contamination to the city's water supply. Of course Flint is another example, the Enbridge contamination of the Kalamazoo River another. We need and the people of Michigan deserve stronger standards to protect our water supply and public health. Michiganders rely on DEQ to protect us through the water quality standards rather than to protect the companies that put toxins into the environment that one way or another end up in our water supply. The revision of these standards to decrease permissible levels of pollutants is long overdue. Standards for toxic chemical do not take into account the cumulative burden citizens face from all sources of contaminants they are exposed to through food, water, pesticides and airborne pollutants. We need stricter standards for individual chemicals that recognize cumulative burden. I urge you to adopt the Michigan Generic Clean Up Criteria Proposed Rules Revision immediately and without softening the standards in favor of more leniency toward industry polluters.	Comments received.	None
Overall		WCDPW	These standards should be approved because they more closely reflect the best available science. As a result, the proposed standards will do a better job of protecting public health from environmental hazards. Michigan law requires cleanup criteria to use best available science to protect the public health. Our current standards, especially those for 1,4-dioxane, are based on old studies that underestimate the danger from chemical	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental	None

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			exposures. The 85 ppb dioxane standard has failed to adequately protect residents across the state, simply because Michigan has been slow to update our cleanup criteria. And it has failed our community as a whole, as we have watched dioxane expand every year while spreading toward our main municipal water supply. Already, Ann Arbor has been forced to close what was once their primary municipal wellfield because cleanup of the aquifer could not be mandated to safe levels under the current standard. We all now know that dioxane and a small number of other substances on the list are more dangerous than previously believed – it would be quite a statement if the DEQ chose not to act on that knowledge and recommend current standards. We do believe that there are still improvements to be made, particularly for child exposure – but we need the new standards now. In communities like mine, where pollution has been allowed to remain and spread based on outdated assumptions, these new standards are critical to protecting public health. Please adopt these new standards and then consider improving exposure assumptions to bring our standards in line with the nation and majority of states.	adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints.	
Overall		WCPH	These criteria are an important part of protecting public health, safety and welfare in addition to adding certainty to the remediation, closure and redevelopment of contaminated sites across the state. It is imperative that these criteria be implemented across the state. WCPH recommends that the DEQ promulgate the proposed rule package as proposed by year's end {or with minor revisions) to insure that new rules are promulgated this year. WCPH supports the decision that USEPA's IRIS be used when data are available. WCPH agrees that the DEQ should evaluate whether IRIS is the best available data and DEQ should choose an appropriate input value using its best professional judgment. In these cases, the DEQ must be transparent when these choices are made and	The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. The DEQ concurs with the commenter that it should evaluate whether IRIS is the best available toxicity	None

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			must justify the rationale in choosing an input different than IRIS. WCPH is pleased to see that the DEQ included a child receptor as part of their consideration in developing new generic cleanup criteria. The use of a child receptor takes a more conservative approach in developing new cleanup criteria and helps protect the health, safety, and welfare of some of our most vulnerable population. While this is a good start, WCPH wants to see further protection around both the lifetime risk factors and child receptor model to provide the best possible protection of our residents. WCPH supports the DEQ developing a more dexterous approach to updating generic clean up criteria. To that end, WCPH wants to see the hierarchy and the algorithm promulgated in the rules without the table of values. This allows the DEQ to recognize new, best available science and use these da ta to generate new cleanup criteria through an open and transparent process. Similarly, Washtenaw County Public Health urges the DEQ to develop a process whereby the regulated community, local governments, NGOs, and the public can petition the DEQ to review clean up criteria when new science is available or the science on which the criteria is based comes into question. The DEQ has attempted to update these criteria numerous times over the past nine years and it has been fourteen years since these criteria have been updated. There is a significant amount of new, best available science that needs to be reflected in the DEO cleanup criteria. For example, USEPA's IRIS process developed new toxicology data for 1,4-dioxane in 2010, yet the DEQ has not updated the state criteria to reflect this new information until the currently proposed rules package. We now know that 1,4-dioxane is more dangerous than previously believed and currently legislated. The current clean up level of 85 parts per billion (ppb) for 1,4-dixoane is the highest in the nation. In communities like Washtenaw County, with a large plume of 1,4-dioxane under several square miles of the City of Ann Arbor, Ann Arbor Township and Scio Township, these new standards	information and should determine the appropriate value. This approach is consistent with how the DEQ implemented the CSA recommendation 1.1. The DEQ concurs that there should be a more nimble approach to updating cleanup criteria. The DEQ supports an approach similar to the AQD rule 230 process and will pursue including a similar process in future rule revisions.	

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			are critical to better protecting public health. WCPH urges you to adopt these new standards and requests you consider changing the process for updating criteria in the future. The current process is flawed and needs to be amended so that new science can be rapidly incorporated into criteria. The cumbersome nature of the process leads to unnecessary risks to health, safety and welfare of Michigan residents.		
Overall		API	*9-6-2016*: The State's Office of Regulatory Reform and the DEQ's collaborative stakeholder's initiative (CSI) identified that the rules were last updated in 2002 and requested that they be revised once again. The original CSI worked to minimize false positive generic determinations of "contaminated" sites in Michigan to streamline the ability to efficiently meet the regulatory clean-up obligations at each site. The proposed rules attempt to revise existing generic clean-up criteria that facilitate the assessment of risks at contaminated sites and revise concentrations that represent an acceptable risk to public health, safety and welfare, and the environment. Despite these good intentions, multiple analyses by industry experts reveal that the proposed generic cleanup criteria are anything but clear. In fact, there are several examples where the DEQ's proposal is inconsistent with their intent and the objectives of the original CSI. Overall, the proposed rules will greatly impact the cost and expediency in which facilities may be remediated and ultimately cleaned up. The degree of uncertainty that exists in industry as to how the new criteria would be applied will make Michigan less attractive for business development and thus hinder the state's emerging economic growth. After several meetings with oil and gas industry leaders, there is growing concern and focus in the regulated oil and gas community on several points including: 1) Comment specific to Rule 27. 2) Insufficiently defined risk pathway receptor scenarios and agency discretion will enable imposition of site-specific criteria which are more stringent than the new	1) See response to comments for Rule 2(h) 2) The rule provisions of concern were removed 9-29-2016. 3) Comment received. The DEQ believes the updated cleanup criteria are appropriate and necessary to protect public health, and are consistent with current science. 4) Comment received. It is not clear why the exposure assumptions change in the criteria would not have a meaningful advancement of the protection of public health. 5) Comment received. It is not clear why it is expected that there will significant increases in cost and time to perform corrective actions or closure if the current rules take effect. 6) The liability protection provided by an approved NFA Report or Closure Report is governed by the statutory provisions of section 20126(4)(e) and section 21323a(4)(d) of the act, and not these rules. The application of the provisions that provide what a person may be liable for is not changed by the proposed rules. 7) The DEQ has proposed an effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to	Rule 2(h) Rule 4(10) Rule 27(12)

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			default criteria but do not provide any additional protection. 3) The process to calculate clean up criteria that is proposed in the new Michigan rules may result in work that is not necessary to be protective of human health and may result in using values that are inconsistent with current science. 4) Changes to the default screening criteria are based on unrealistic exposure assumptions, without any meaningful advancement of the protection of human health and the environment. 5) Significant increases in cost and time, for both a party performing corrective action work and the DEQ, to assess, characterize, and close sites will be the standard in Michigan, if the current proposed rules were to take effect, which will lead to more idled, less productive, fewer tax-bearing properties and businesses. 6) There will be disruption with currently approved characterization and corrective action plans at sites that have not yet been closed. The DEQ has made clear that no site will be exempt from the new criteria, even sites that are locked into current criteria under the Part 213 statute (Leaking Underground Storage Tanks). Such late stage risk evaluations and reprocessing of site corrective action measures will significantly increase the level of the DEQ's efforts to close sites, as well as the cost burden on taxpayers to support those efforts, without any meaningful advancement of the protection of human health and the environment. 7) The application of the new criteria to sites in late stages of corrective action will adversely challenge the timing, costs, and value of transactions, compared to closed sites or those with a more certain path to closure. 8) The proposed rules could impact the potential re-use of properties owned by the oil and gas industry. Properties that have obtained environmental closure typically are viewed more positively in the real estate market with regard to future uses, valuation, and financing. These properties range from the typical gas station comer properties to larger industrial properties,	rule promulgation to 6 months after rule promulgation. 8) Revisions have been made in the VIAP to make it more explicitly consistent with the ITRC approach for petroleum releases. See response to comments for Rule 27 for further details.	

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			and include vacant sites as well as operating locations. The DEQ asserts that the newly proposed rules offer flexibility to the regulated community to select response activity necessary to address facilities. However, this will not be the reality for Michigan's oil and gas industry. Instead, there will be significant delays and additional costs for project closure which in some instances may be so prohibitive that site closure is impossible. Unlike the current criteria or those provided by the ITRC, the proposed rules are inconsistent and unpredictable in their application and impose additional obligations that will make Michigan an unattractive place to operate. These new proposed rules appear to be the DEQ's response to months of work and discussions between industry experts and DEQ staff, but that is not the case. Rather, it appears that the fruits of those discussions have not made it into the rules package currently pending, and the DEQ's decision to hold a hearing on October 17, 2016 does not provide sufficient time for the parties to have any meaningful discussions on the many remaining issues. The industry asks that the October 17 hearing be postponed and that a new stakeholder group be promptly formed, comprised of experts and the appropriate Michigan regulators. This group can adequately review and revise the proposed rules to ensure they are supported by sound science and provide for efficient, affordable, and effective site clean- up in Michigan. *10-18-2016 Additional comments*: This letter is in response to the updated proposed rules. Our original issues have not been addressed by the revised rules and this letter reflects our ongoing concerns. Further, the process that the DEQ has followed in this round of rule promulgation is troubling. After months of input from stakeholders and interested parties, the DEQ has seemingly ignored the bulk of commentary and quickly scheduled a hearing soon after the release of a lengthy revised daft of the proposed rules in a rush to push through a large number of changes, which do not track established science. This package of proposed rules leaves more questions than answers to the regulated		

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			industry, which has been a willing participant throughout the process. It is my hope that cooler heads will prevail, the DEQ will not pursue promulgation of the recently proposed rules and an appropriate process for rule development will occur. Literally hundreds of hours of potential progress will have been wasted, if these proposed rules go into effect in their current form.		
Overall		CHAMBER	*9-12-2016*: We are here today to voice our strong opposition to this rule set. Strongly oppose the proposed rules because they will halt the resurgence that we have seen in the safe cleanup of contaminated sites. The Chamber supports necessary & reasonable regulations based on sound science & accurate data; these rules fall far short of that. These rules constitute one of the worst examples of bureaucratic overreach we have seen, not to mention very poor stakeholder relations. The Chamber and other interested parties worked with Senator Casperson and the DEQ to develop legislation to repeal the previous cleanup criteria because it had become an obstacle to contaminated site cleanup rather than a path to compliance. The DEQ worked very closely with all stakeholders on the first round of cleanup criteria, ensuring that every stakeholder was heard and that, to the extent possible, their concerns were addressed in the final version of the criteria rules. In the end, and in the best interest of the state, the Chamber supported the rules moving quickly through legislative review so they could take effect immediately. Unfortunately, after completing the first half of the cleanup criteria, the DEQ abandoned the previously successful cooperative approach and, decided stakeholder input would not be accepted for the remaining criteria. Developing criteria in a vacuum and ignoring the concerns of stakeholder's only stands to hurt our state, not help it. The DEQ made matters even worse when it started the promulgation process without consulting stakeholders or providing stakeholders with the necessary information to understand the intent of the rules. Despite a huge outcry by stakeholders, the DEQ planned to move forward with a	Comments received.	None

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			public hearing, recognizing it was almost impossible for anyone to have a quality grasp on the rules. We are concerned that the DEQ would take such an extreme departure from what was a very successful stakeholder relations process over the past six years to what now appears to be the old DEQ where stakeholders are viewed as the enemy. The rule set before us today reads more like a wish list of DEQ staff rather than the robust discussion with stakeholders based on sound science and best practices. Staff have even brazenly put back in rules that the DEQ had agreed to eliminate. Worse yet, they have used that opportunity to expand those bad rules and made them far worse. This rule set is a clear example of the DEQ trying to legislate through rules to undo agreed upon changes. This present the ominous sign to job providers that the DEQ intends to ignore stakeholders and that the days of beneficial collaboration are now behind us. We appreciate that a short delay was given for a stakeholder process in attempt to resolve the many issues this rule set creates. But, it appears that process has ended and been declared a failure, despite the fact that stakeholders viewed it as being a positive step towards a conclusion. What is the DEQ trying to accomplish and why has it once again walked away from stakeholders. The DEQ has already been provided amendments from the regulated community, the Chamber supports those amendments. We believe all of these changes can be completed in a timely manner so that updated proposed rules can be quickly published for public review and comment and the rules ultimately promulgated by December 31, 2016. *10-18-2016 Additional comments*: The Chamber strongly opposes the proposed cleanup criteria rules because they will halt the resurgence we have seen in the safe cleanup of contaminated sites in Michigan. The Chamber supports necessary and reasonable regulations based on sound science and accurate data; these rules fall far short of that. We strongly encourage the DEQ to go back to the		

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			stakeholder group they recently created to try to resolve the differences that exist in this rule set. There is far more value in working with stakeholders to reach an agreeable outcome even if it takes a little more time, then forcing a rule set through with strong opposition simply to meet an artificial deadline. The revised rules ignore the changes requested by job providers represented on the DEQ's stakeholder group. We again ask the DEQ to work with their stakeholder group and listen to the many substantial issues that have been raised and try to find an agreeable path forward. The Chamber supports the changes that have been identified by the business representatives on the work group and we request that those changes be made before the rules moves forward. Job providers remain committed to a collaborative process to fairly address our and other stakeholder issues so that we can ensure this rule set moves forward quickly. We are of course willing to work with the DEQ to expedient specific pieces of the rule set to ensure quick action on some sensitive issues separately.		
Overall		CONSUMERS	*9-13-2016*: In general, we find the rules package concerning. There are many changes that cause a lack of clarity and inconsistency in the rules package. We are also concerned that recommendations from the ORR process were not followed and reasoning for this is unclear. Specific comments are provided. It is understood that when new rules are promulgated they are immediately in effect. This could be problematic for existing facilities and facilities that have documents under review. Recommend that implementation guidelines be inserting to the rules to identify how existing sites will be treated. Some of the exposure assumptions used by the DEQ in developing criteria are not logical or practical. For example, 24-hr single event duration, living in a flooded basement for 32 years, etc. The assumptions should be evaluated again and brought in line with the USEPA and/or other regulating agencies.	The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation. Exposure assumptions were revised 9-29-2016 that address the exposure for a workday and the volatilization to indoor air assumptions for groundwater less than 3 meters below ground surface.	Rule 4(10)

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			10-18-2016 Additional comments: While we appreciate the effort that the DEQ has put forth in this package, we still find many changes concerning and inconsistent. We are also concerned that recommendations from the ORR process were not followed and reasoning for this is unclear. Specific comments are provided.		
Overall		DOW	*9-13-2016*: Dow is supportive of ongoing efforts of the DEQ to improve regulations and has participated in several Stakeholder discussions on this topic. This includes Dow's participation on the CSA in 2014, whose recommendations were agreed to be the basis for the proposed changes. Dow has thoroughly reviewed DEQ's proposed revisions to the rules, and unfortunately there are several instances where DEQ seems to ignore the recommendations brought forward by the CSA. Comments relating to items of specific interest to Dow regarding 2,3,7,8- tetrachlorodibenzo-p-dioxin (TCDD) and other 2,3,7,8-substituted dioxins and furans are provided. Dow also assisted in developing, and adopts and supports the written comments submitted today by the MMA. Because those comments are extensive, Dow will not repeat them here, but incorporates them by reference. *10-18-2016 Additional comments*: These comments supplement those provided by Dow on September 13, 2016 regarding the April 14, 2016, draft criteria in the very limited time DEQ provided to prepare comments. Dow has thoroughly reviewed DEQ's revised proposal, and unfortunately there are still several instances where DEQ seems to ignore the recommendations brought forward by the CSA and other industry stakeholders. DEQ has proposed rule revisions that are not technically consistent with the physical chemistry and the fate and transport mechanisms of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and other 2,3,7,8-substituted polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs). The DEQ proposed rules are premised on unrealistic physical chemistry values and assumptions that are not proven or substantiated, and provide results that are not	See responses to comments for Rule 50(7), Table 3	None

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			reflective of the science. Arbitrarily combining classes of chemicals with PCDD/Fs and treating the resulting group as a single substance is inconsistent with Part 20I's liability approach, not scientifically supportable, unnecessary, and not an approach used by USEPA or surrounding states. As the scope of our comments are technical in nature, Dow believes that a meeting of DEQ and Dow technical personnel would be beneficial and would like to schedule such a meeting. Dow also assisted in developing, and adopts and supports the written comments submitted today by the MMA. Because those comments are extensive, Dow will not repeat them here, but incorporates them by reference. As an initial matter, Dow objects to the very limited time DEQ has provided to prepare comments. This time period does not provide enough time for stakeholder review or input on this very important and far-reaching rules package and appears to be driven by arbitrary deadlines.		
Overall		GLELC	GLELC is generally satisfied with the Proposed Rules, particularly those that strive to keep up with the most current science. However, much more needs to be done in this rulemaking, and in future rulemakings and other administrative actions such as remedial plans and guidance documents, to implement the 2010 Michigan Environmental Justice Plan and to more generally address the significant and pernicious problem of disproportionate pollutional impacts on low income, minority, and other vulnerable environmental justice communities. 1. <u>DEQ should expressly address environmental justice issues through this rulemaking.</u> Comments specific to Rule 34. 2. <u>DEQ needs to adjust the criteria so that they more adequately protect children.</u> The Proposed Rules do not appear to adequately protect children with regard to developing the health-based values. The development document states that "For the residential category, DEQ characterizes the carcinogenic and noncarcinogenic health effects to children ages <1 to	1. See response to comments for Rule 34. 2. The proposed rules reflect the CSA recommendation 2.1 to use an age-adjusted child plus adult receptor. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. 3. The DEQ implemented CSA recommendation 2.2 to use USEPA information to develop a process to account for developmental or reproductive effects. Based on available reproductive toxicity data and USEPA guidance, the criteria are protective of reproductive endpoints. 4. Comment received. The proposed new rule is	Rule 2(h)

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			6 years and the adult population by combining exposures of these two subpopulations (e.g. age-adjusted intake rates) when developing health-based values." To the extent this means that health-based values do not accurately reflect the exposures of children ages <1 to 6 since that subpopulation's exposure is combined with that of adults, that should be changed. If DEQ assumes that members of the <1 to 6 year old subpopulation will be exposed, and assuming that subpopulation is the most vulnerable when compared to older subpopulations (excluding all other pertinent non-age factors), then DEQ should develop health-based values that are protective of that subpopulation for the residential category as to carcinogenic and noncarcinogenic health effects. DEQ already focuses on children ages <1 to 6, as well as pregnant females, when developing residential health-based values with regard to risk to hazardous substances with developmental and reproductive effects. Also, the notion of using a child receptor was raised in the October 2014 TAG report. The development document does not appear to explain why DEQ went against this. 3. <u>DEQ needs to better protect adult workers in nonresidential contexts.</u> DEQ explains that the "nonresidential health-based values address adult workers as generic receptor and pregnant workers for developmental hazardous substances." DEQ commits to addressing developmental and reproductive exposures in various portions of the Proposed Rules. However, it is unclear that in the non-residential context, DEQ is protecting reproductive exposure for adult workers generally. To the extent that that is accurate, DEQ should adjust the criteria to ensure that adult workers in nonresidential contexts are protected from reproductive exposure to contaminants. 4. <u>DEQ needs to improve public notice and comment opportunities for cleanup actions that will affect environmental justice communities.</u> Part 201 provides for public notice and comment when DEQ determines that there is "significant public interest." DEQ can in its current rulemaking define "significant	outside the scope of these specific rules. 5. See response to comments for Rule 2(h).	

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			public interest" to presumptively apply to proposed cleanup activities in environmental justice communities. DEQ should define environmental justice communities using ready-made tools such as USEPA's EJScreen. DEQ should provide notice to these communities after the completion of the remedial investigation and again before approval of any remedial action plan, response activity plan, or no further action report. The means of providing notice should at the very least reflect the public outreach toolkit from the 2010 MI EJ Plan. 5. DEQ should better define the scope of application of its definition of "relevant pathway". Comments specific to Rule 2(h).		
Overall		GM	GM is experienced and knowledgeable regarding the environmental remediation rules found in Part 201 and has, over the years, collaborated with the DEQ to make the rules more effective. These efforts have included participation in stakeholder efforts to promote the principles of sound science, transparency, and improvements to the administrative effectiveness of these rules. GM supports the DEQ's intent to provide a needed update to the criteria in the Part 201 administrative rules and encourages it to carefully consider the comments provided by the MMA. We believe these comments will make the Part 201 administrative rules more effective, consistent with the principles noted above.	Comment received	None
Overall		HALEY	1. No certainty that sites with NFAs will not be reopened Concern with rule and potential consequences: The proposed rule does not address how sites (which shall remain closed, exempt, or substantially complete) that have received a No Further Action (NFA) will remain as such and "grandfathered" under the old rule. Proposed modification to proposed DEQ change: Add language to the rule that specifically indicates that these closed sites will not be reopened as a result of rule changes. 2. No transparency to criteria changes Comments specific to Rule 40. 3. Definition of relevant pathway	1. The liability protection provided by an approved NFA Report or Closure Report is governed by the statutory provisions of section 20126(4)(e) and section 21323a(4)(d) of the act, and not these rules. The application of the provisions that provide what a person may be liable for is not changed by the proposed rules. 2. See response to comments for Rule 40. 3. See response to comments for Rule 2(h). 4. The requirements of land and resource use restrictions are governed by statutory provisions that would not be affected by these rules.	Rule 2(h)

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			Comments specific to Rule 2(h). 4. <u>More stringent land use restrictions</u> Concern with rule and potential consequences: Changes to the rule will result in more stringent Land Use Restrictions and uncertainty as to whether the agency would accept restrictive covenants or some other prescription to facilitate closure.		
Overall		KOMAN	I appreciate the DEQ's willingness to extend the public comment period, and I appreciate the diligent work by you and your staff to prepare the rulemaking package. All of our Michigan communities have a large stake in protecting own groundwater and land resources and safeguarding children's health. Every parent who has ever told their child to take off their muddy clothes or shoes before they track dirt into the house knows that children come into contact with the environment differently than adults. We rely on DEQ to be sure that the soil and water our citizens come into contact with will not harm them from regulated chemical releases. The DEQ must take into account concerns of the state's current and future residents regarding environmental protection in a meaningful way. These clean ups often span generations, thus the State must safeguard the public trust for our water and land resources from pollution, as required by the law. Because of the connection between having generic clean up criteria and facility owners' ability to move forward with remediation, which enhances environmental quality, I generally support the hazardous substance generic criteria in the proposal. However, the DEQ could improve the rulemaking to fulfill the statutory requirements to consider reasonable and relevant exposure pathways for children and to use the best available scientific information. Specifically, the DEQ should: 1. Include a child receptor in the exposure calculations and educate local groups about children's environmental health. 2. Expand the use of the most sensitive receptors and	1. The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The proposed rules reflect the CSA recommendation 2.1 to use an age-adjusted child plus adult receptor. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. 2. The DEQ concurs with the commenter. Further review will be conducted as part of future revision of the cleanup criteria. 3. The DEQ concurs with the commenter. Further review will be conducted as part of future revision of the cleanup criteria. 4. The DEQ concurs with the commenter. This approach is consistent with how the DEQ implemented the CSA recommendation 1.1. 5. Further review will be conducted as part of future revision of the cleanup criteria.	None

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			lifestages (such as developmental toxicant evaluation (Table 1 footnote DD) in residential standards). 3. Include sensitive reproductive endpoints for men and women for both residential and non---residential standards (e.g., assess pregnant women who are present at industrial sites). 4. Support the use of current scientific data from the U.S. USEPA IRIS database of peer---reviewed and approved USEPA chemical toxicity values, and where these values are dated, to examine reviews from other credible scientific bodies such as the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) and the International Agency for Research on Cancer (IARC). 5. Consider cumulative environmental exposures, especially for vulnerable communities. Over 100,000 Flint residents have been exposed to lead for an extended period of time as have other Michigan residents where lead paint and legacy contamination is common, and people move across the state. Thus, these baseline exposures should be accounted for in establishing statewide generic criteria. DEQ should develop an environmental justice model criteria that accounts for aggregate exposures. The law directs DEQ to protect reasonable and relevant exposure pathways, and this is especially critical to protect our children from hazardous substance exposures where they live, attend school, and play. The assessment of soil vapor intrusion is an important pathway that should be fully evaluated and incorporated into the criteria. DEQ should also strengthen the public health protections in the generic criteria for children in the rulemaking. <u>Generic Clean Up Standards Needed to Protect Public Health and Welfare</u> The State of Michigan should have in place up-to-date generic clean up criteria that relies on the best available scientific data. The people of the state rely on this basic function of the state under Section 324.20120a of the statute Environmental Remediation Part 201 of the NREPA 451 to inform citizens of levels of contamination		

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			deemed unacceptable and actionable for remediation. <u>Fulfill Statutory Mandates by Using a Child Receptor</u> Section 324.20120a gives the DEQ the authority to establish generic cleanup criteria Which are used to identify and remediate sites of environmental contamination. By law, clean up criteria will be based on • Human health risk assessment assumptions • Reasonable and relevant exposure pathways • Best available scientific information • Acceptable levels of risk (in statute) and other general info (e.g., use of state drinking water standards). Under the law, costs are not a consideration for DEQ in establishing the generic criteria or establishing health---based levels. Costs are appropriately considered during implementation when considering clean up technologies, treatments and timelines. To adequately address reasonable and relevant exposure pathways and to incorporate the best scientific information as required by law, the generic clean up criteria should better reflect children's environmental exposures. The rule package should include a child receptor, as 12 other states, such as Texas and Georgia do. Accordingly, DEQ should replace the age--- adjusted receptor and the adult---only receptor for drinking water with a child receptor. Life stages matter for children's exposures. The child receptor approach is superior science and better reflects relevant pathways because children are not just little adults: • Children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults. • Children's behavior patterns may make them more susceptible (e.g., breast feeding, playing on or near ground level, putting hands in mouth, getting dirty, exploring the outdoors). • A child's neurological, immunological, digestive, reproductive, and other bodily systems are still developing. • The rapid growth and development of organ systems that takes place during childhood increases the		

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			vulnerability of children. • A child's metabolism may be more or less capable than an adult's of breaking down, inactivating, or activating toxic substances. • Recent studies indicate that children's mental and physical development over their entire life course is adversely altered by early life exposure to lead, mercury, dioxins, PCBs and a host of other contaminants. Thus, prenatal and childhood exposures cast a long shadow over future wellbeing of the children of our State. Childhood exposures are thus a relevant and reasonable to quantify more properly through the use of a child receptor. This will allow DEQ to better reflect best available scientific information, as required by law. For the many hazardous chemicals, data about non---cancer toxicity endpoints are available based on developmental toxicity, so the most sensitive endpoint and life stage can and should be used. Further, DEQ should also educate the public about the use of a child receptor and children's environmental health. Current scientific information would allow for DEQ to more appropriately characterize children's environmental exposures and risk as required by law. Thus, I support strengthening DEQ's rulemaking to better consider children's environmental exposures, cumulative exposures, reproductive health, and the most current scientific data and approaches.		
Overall		MCC	*9-13-2016*: The MCC believes that it is critical for the state to have an effective remediation and redevelopment program to address contaminated properties, to protect public health and the environment, and to promote economic development for new uses. We also recognize the importance of sound science-based policies to facilitate this mission. Over the past decade, a number of improvements to the Part 201 program have enabled increased remediation activity and growing success in closing open sites. This provides many community benefits and should be applauded. Hence, we appreciate the work of the DEQ to develop these	*10-18-2016* comments: 1. The proposed subrules addressed by this concern were deleted on 9-29-2016. 2. See response to comments for Rule 2(h). 3. See response to comments for Rule 3(2). 4. The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in	Rule 2(h) Rule 4(10) Rule 50, Table 1 Rule 46, Tables 1-4

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			proposed rules, including the efforts of the CSA workgroup comprised of individuals from a number of interests, including MCC members. That said, we echo the comments of many others who have expressed concerns about the potential impacts of these rules upon the Part 201 Program. We have addressed just a few of these issues in our comments below. 1. The proposed rules would shift away from the use of generic cleanup criteria and place significantly greater emphasis on the use of site specific criteria. The new rules would (at the open discretion of the DEQ) require persons implementing response activities to prove that the generic cleanup criteria are appropriate for that site, given a number of uncertain factors. This would add significant responsibilities and costs upon the regulated party, without any evidence that the generic criteria are not already protective. Moreover, any prospective purchaser of a property would likely be responsible – through a BEA – for evaluating whether the property would in some way exceed the generic criteria based on the DEQ's application of more stringent site-specific criteria. 2. Comments specific to Rule 2(h). 3. It is still unclear as to how the new rules will be implemented with regard to remediation plans and activities already in progress. Some have argued that the new rules should apply to a large majority of planned activities, even those with substantial reviews already conducted, which would have a significant major impact upon those plans. The DEQ should also make clear the responsibilities of owners of property that have met prior criteria but still have "due care" or other obligations, as well as the timeframes expected for properties newly subject to Part 201 obligations. 4. The new rules would incorporate toxicity data including "draft" IRIS sources that may not meet the standard of "sound science" as articulated by the CSA workgroup. Such draft values have not likely completed their own scientific or regulatory review, and so should not be	reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation. 5. The use of draft toxicity values was eliminated. All draft toxicity values were replaced with a final value, or a Tier 2 or Tier 3 value.	

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			adopted as a final value for the purposes of toxicity data for Part 201 purposes. These are just a few of the many issues identified by our member companies and articulated to the DEQ as part of ongoing stakeholder discussions. There are many others that would also present concerns and merit attention. Unfortunately, while the DEQ has provided a small extension of the comment period for this rules proposal, we also believe that additional time is needed to properly address these many concerns. It may be in the DEQ's best interest to identify areas of consensus in these rules which may be ready for promulgation, while deferring final action on other areas of the rules until all the implications have been vetted. In conclusion, we urge the DEQ to take seriously the concerns that have been identified and to work earnestly with all stakeholders to improve the proposed rules. We believe that this initial rules package has serious flaws (several of which have been acknowledged by the DEQ) that would threaten our state's recent progress in substantial remediation of Part 201 sites. We hope that the DEQ will address these concerns, and that the Legislature would also consider such feedback as it evaluates the extent to which the rules reflect the original intent of the legislation that initiated these changes. *10-18-2016 Additional comments*: 1. The proposed rules, particularly changes to rule 299.4, would shift away from the use of generic cleanup criteria and place significantly greater emphasis on the use of site-specific criteria. 2. Comments specific to Rule 2(h). 3. Comments specific to Rule 3(2). 4. It is still unclear as to how the new rules will be implemented with regard to remediation plans and activities already in progress. 5. The new rules would incorporate toxicity data including "draft" IRIS sources that may not meet the standard of "sound science" as articulated by the CSA workgroup. As recommended by the CSA regarding best science, we support a provision to adopt new IRIS values and other toxicity determinations once finalized.		

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			Unfortunately, the regulated community continues to believe that these issues have still not been properly addressed during this extremely expedited rules comment period, and that it may be in the DEQ's best interest to identify areas of consensus in these rules which may be ready for promulgation, while deferring final action on other areas of the rules until all the implications have been vetted.		
Overall		MDHHS	This letter is to document the MDHHS comments on the DEQ Revisions to the Proposed Cleanup Criteria Rules. MDHHS supports the efforts of the DEQ in updating their Cleanup Criteria to reflect the best available science. Both the DEQ and the MDHHS have a responsibility to protect the health of Michigan's citizens from environmental chemical hazards. Public health is best protected when the best available science is used to assess chemical exposures. MDHHS recognizes that protective public health actions must often be taken with less than 100% certainty. Uncertainties can and do exist related to chemicals and the actual human exposures due to limitations in the science or resources available to eliminate that uncertainty. In order to continue to be public health protective, it is imperative that the Cleanup Criteria be updated expeditiously. Based on the work that has been done to prepare these updates, it is clear that not all of the current Cleanup Criteria are sufficiently protective. One example of this is the current Residential Soil Direct Contact Criterion for lead, which is 400 parts per million (ppm). The proposed Residential Soil Direct Contact Criterion, 190 ppm, is less than half of the current value. If the updated Criteria are not implemented, children will be knowingly exposed to lead levels that may result in harmful health effects. Another example is the vapor intrusion screening levels for groundwater and soil. Vapor intrusion occurs when levels of chemicals contaminating the soil or groundwater volatilize and move into the indoor air of buildings. Current Cleanup Criteria, called the Soil Volatilization to	1. The DEQ concurs with the commenter. This approach is consistent with how the DEQ implemented the CSA recommendation 1.1. 2. The DEQ concurs that the proposed criteria provide better protection for public health, safety and welfare than the current criteria with the revision of the residential receptor to include the child plus adult exposures rather than only an adult. The DEQ has included a child-only receptor for hazardous substances with best available health benchmark toxicity values based on noncancer developmental adverse endpoints. The DEQ will pursue the appropriate use of a child only receptor in a future revision of the cleanup criteria for other hazardous substances and other noncancer endpoints. Further review of available information will be conducted as part of future revision of the cleanup criteria. 3. The DEQ concurs with the commenter. The exposure assumptions used for the proposed cleanup criteria are reasonably conservative values to represent reasonable maximum exposure for all populations and generic land uses. 4. The DEQ concurs with the commenter that it is appropriate to combine isomers or class-specific chemicals for some hazardous substances for the purpose of comparison to generic cleanup criteria. This practice is consistent with USEPA RSLs and	Rule 6(12)-(18)

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			Indoor Air Inhalation Criteria and the Groundwater Volatilization to Indoor Air Criteria are much higher than the proposed Tier 1 Groundwater and Soil vapor intrusion screening levels for several chemicals commonly found at vapor intrusion sites. These current Cleanup Criteria allows orders of magnitude (hundreds to thousands of times) higher levels of these chemicals to remain in the environment than the proposed Tier 1 generic vapor intrusion screening levels. With the Current Cleanup Criteria, sites with levels of benzene, tetrachloroethylene, trichloroethylene, or vinyl chloride that continue to pose a potential vapor intrusion risk could be considered closed and no further work required. MDHHS is aware that people have been exposed to elevated levels of tetrachloroethylene at more than one site in Michigan for months to decades. So far, one local public health department has needed to issue three "no-vacancy" orders to end these exposures. Without promulgation of the proposed Cleanup Criteria Rules, people will be at risk of unknowingly breathing in elevated chemical levels in their homes or other buildings. This chemical exposure could lead to harmful health effects. MDHHS has identified major issues impacting public health protectiveness of the updated Cleanup Criteria: 1. Toxicity value selection- MDHHS supports selection of a toxicity value representing the best available science from the list of sources recommended by the Technical Advisory Group 1 and endorsed by the CSA Workgroup. Solely using the USEPA's IRIS values would result in use of values that are decades old, which in most cases limit the studies and health endpoints evaluated. Using these decades' old values is not health protective when more current values protecting against multiple health outcomes are available. The original Technical Advisory Group 1 recommendation was to select the value representing the best available science among a list of values; use of IRIS is not "first" in a hierarchy for automatic selection of a value, but rather the first source to evaluate. The value representing the	other states for these hazardous substances. In general, the DEQ requires combining isomers for comparison to generic criteria where analytical limitations preclude identification and quantitation of the individual isomers and the isomers are known to produce the same or similar adverse health effects. For example, xylenes has three isomeric forms designated as ortho- (o-), meta- (m-) and para- (p-), but is quantified as xylenes. Such hazardous substances are designated with Footnote (J) in the generic cleanup criteria tables. Trimethylbenzene isomers, while producing similar adverse health effects, can be individually identified and quantified, such that it is appropriate to retain generic criteria for the individual isomers. The DEQ has reviewed the proposed drinking water criteria for PFOS and PFOA, and has revised the criteria to be the health advisory values as presented in the USEPA Drinking Water Health Advisories [PFOA - EPA 822-R-16-005, May 2016, and PFOS - EPA 822-R-16-004, May 2016]. Compliance with the drinking water criteria will require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L due to the unique behavior of these substances and their emerging contaminant status. 5. The DEQ intends to publish Acceptable Air Concentrations as part of the updated the DEQ's VIAP guidance. 6. This concern was discussed further as part of the Part II Stakeholder Process. The DEQ has removed rule provisions that would have allowed criteria to be updated in accordance with statutory provisions (e.g., SDWS, GSI) as the provisions appear to conflict with APA requirements. The DEQ will address hazardous substances that do not have promulgated criteria with site-specific criteria. The	

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			best available science must be selected to demonstrate a diligent endeavor to protect public health. For example, the IRIS Reference Dose for ethylbenzene, 0.1 mg/kg/day, was published in 1987 with a low confidence in the critical study from 1956 due to only one sex of rat tested (female) and the exposure not being chronic. The DEQ selected an oral intermediate duration Minimal Risk Level the Agency for Toxic Substances and Disease Registry {ATSDR) developed in 2010. DEQ toxicologists adjusted for chronic exposure, resulting in the DEQ reference dose of 0.04 mg/kg/day. The ATSDR value is based on a 2007 study exposing male and female rats daily to ethylbenzene for 13 weeks and using a pharmacokinetic model to estimate internal doses and human equivalent doses. Pharmacokinetic models represent the best available science, when there is sufficient information on fate and transport of a chemical in the body. Additionally, ATSDR was able to evaluate many more studies that were published after 1987, improving the scientific robustness of the ATSDR value. An argument could be made that defaulting to USEPA science and evaluations are preferred as they are the U.S.'s lead agency in the field of risk assessment. However, if that is the case, there are multiple elements where the DEQ Cleanup Criteria need to align with USEPA risk assessment practices. Two of the most prominent differences are that the USEPA uses combined exposure pathways (inhalation, dermal contact, and ingestion for tap water and soil) and a child only receptor for non-cancer effects while the DEQ uses a single exposure pathway (ingestion for drinking water) and only two for soil (dermal contact and ingestion) and an age-adjusted receptor. These two differences, and others, create a cascade of differences, resulting in the DEQ using alternate exposure inputs and physical parameters, which ultimately results in less public protective DEQ Cleanup Criteria, greater human exposures, and greater risk of harm to the public. For example, the USEPA Regional Screening Levels separate out different worker exposure with an indoor,	DEQ believes there should be a more nimble approach to updating cleanup criteria. The DEQ supports an approach similar to the AQD rule 230 process and will pursue including a similar process in future rule revisions.	

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			composite, outdoor, and two construction worker (one with standard vehicle traffic, and construction with other than standard vehicle traffic [e.g. grading, tilling, excavating, dozing, and wind]) scenarios. The USEPA's indoor worker soil screening level does not include dermal adherence of soil, but the outdoor and composite worker scenarios assume 0.12 milligrams per square centimeter (mg/cm2), and the two construction worker scenarios assume 0.3 mg/cm2 . Because the DEQ has only one worker scenario, they used an USEPA recommended value, found in the Risk Assessment Guidance for Superfund, Volume I, PartE, of 0.2 mg/cm^2. An example of a difference due to the DEQ use of only one or two exposure pathways is the use of a dermal absorption fraction for volatile organic compounds. The USEPA does not have a default value for this parameter as people's exposure to volatile organic compounds should be addressed through the inhalation pathway for soil (an exposure pathway not included in the DEQ current or proposed Cleanup Criteria). MDHHS supports the use of the DEQ's values for volatile organic compounds as this is a health protective alternative if all of the all relevant exposure pathways are not included in the Cleanup Criteria. 2. <u>Designation of a chemical as a developmental toxicant</u>- MDHHS supports identification of chemicals that have developmental effects based on critical studies with fetal or post-natal exposures in developing animals or epidemiologic studies in developing humans. If effects in fetuses or developing humans or fetal laboratory animals or developing animals are identified, these are developmental toxicants and fetuses and children should be protected from exposure to these chemicals to the best of our ability. MDHHS further supports identification of all chemicals with developmental effects in the entire body of research available for each chemical. This expanded identification would provide increased transparency and a thorough assessment of health outcomes to ensure the health-protectiveness of the Cleanup Criteria for all potentially		

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			exposed people, including fetuses and children. Although the DEQ does not use a child only receptor, identification of a chemical as a developmental toxicant allows child exposure to be assessed, ensuring that the generic Criteria are protective for all populations, particularly sensitive individuals such as children, the pregnant woman's fetus, or people with pre-existing health conditions. 3. To be health protective, the generic Criteria need to be protective of all people in residential and non-residential environments. Unless certain potential future uses of sites are restricted, the generic criteria should be the most conservative value to be protective for all populations and land uses. These Proposed Criteria, and any future updates, should apply to all sites. This will prevent people from unknowingly being exposed to potential chemical hazards. Generic Criteria should be developed using default inputs, including default exposure parameters, such as dermal absorption and soil adherence, and chemical parameters, such as parameters needed to evaluate volatilization and leachability. In certain cases, the generic Criteria may not reflect conditions at all sites. Each facility can develop site-specific Criteria to address this discrepancy. MDHHS reiterates support for the DEQ's generic Cleanup Criteria to be health- protective for all populations even though all site-specific conditions may not match assumptions in the generic Criteria. Ensuring public health protection is a responsibility both the MDHHS and DEQ share, and generic Cleanup Criteria developed using conservative default inputs are health protective. 4. MDHHS supports combining isomers and class-specific chemicals where appropriate. Use of the dioxin-like chemical toxic equivalency factors (TEFs) to fully assess exposure to dioxins, furan, and dioxin-like polychlorinated biphenyls (PCBs) is health protective. Additionally, using a single value to assess 1,2,3-, 1,2,4-, and 1,3,5-trimethylbenzene combined is also health protective, as these chemicals cause the same health effects. MDHHS recommends adding the "J" footnote,		

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			with modification, to PFOA and PFOS as well. The recently released USEPA Health Advisory for PFOA and PFOS has recommended that these two chemicals be added together. As currently presented, the proposed Residential Drinking Water Criteria allow more than double the amount of PFOS+PFOA in drinking water as the USEPA Health Advisory (70 parts per trillion). MDHHS recommends that the DEQ should treat them similarly, and use one value for both rather than having two individual numbers. MDHHS has also identified additional issues to ensure health protectiveness of the updated Criteria: 5. Although the Acceptable Air Concentrations are used an intermediary numbers, rather than being listed as Criteria, it is very important to know people's exposure to chemicals in indoor air. MDHHS stresses the importance of indoor air data in evaluating vapor intrusion and wants to ensure that DEQ staff understand and relay to responsible parties that indoor air is an important exposure route. In order to be protective of public health, DEQ should require indoor air chemical levels to be below the AACs or other health-protective values. At the very least, the AACs should be provided online as supporting documentation to the rule for transparency. 6. MDHHS supports inclusion of R 299.6(19) as it was proactively health-protective. This was present in the previous draft of the Proposed Cleanup Criteria, but was removed in the most current draft. The language would have allowed the DEQ to develop cleanup criteria for a newly identified hazardous substance, a hazardous substance with new information, or a new state drinking water standard. For example, if a new state drinking water standard is issued, this language would have allowed that standard to be used as the new Cleanup Criteria. Without this language, even knowing that a chemical is hazardous, people could be exposed to higher levels than what are health-protective, until a complete future update to the Cleanup Criteria are promulgated. "(19) If a generic cleanup criterion is developed under subrules (13) or (14) of this rule, or modified under		

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			subrules (15), (16), or (17) of this rule, the department shall make the new toxicological, chemical-specific, and chemical-physical data and criterion available by announcing it on the department's internet web site, and by publishing notice of the change in the department calendar, or by such other means that effectively notifies interested persons. The new criterion shall take effect when published and announced by the department as required in this rule. The new data and resulting cleanup criterion shall remain effective and be used as required under these rules until the department promulgates revised data and criteria pursuant to administrative procedures act." MDHHS management and staff work side-by-side with and have the utmost respect for the work of the DEQ. However, one of MDHHS's responsibilities in regards to environmental health is to ensure that Michigan's citizens are not harmed by preventable exposures to chemical hazards. With the knowledge of the increased protectiveness of the Proposed Cleanup Criteria to prevent exposures to chemicals in drinking water, soil, and indoor air throughout the State of Michigan, MDHHS recommends promulgation of the Proposed Cleanup Criteria with the health protective recommendations detailed in this letter.		
Overall		MEC ECOLOGY HRWC LONETREE	On behalf of the Michigan Environmental Council and its over seventy member groups across the state we would like to commend the DEQ and the staff of the RRD in its efforts to update the cleanup criteria for address sites of contamination across the state. Unfortunately, many of the cleanup criteria values currently included in our administrative rules are not based on best available science, and in some cases not even science conducted in the last twenty years. Moving forward we think it is important that the rule both reflect best available science and have a better process for incorporating new science into decision making. At this time, the proposed rule made a good faith effort to include best available science, however, falls short in	<u>Duty to use the best available science.</u> The DEQ concurs with the commenter. This approach is consistent with how the DEQ implemented the CSA recommendation 1.1. <u>Current system of relying on administrative rule updates have placed the public at risk. Alternative approach.</u> The DEQ concurs that there should be a more nimble approach to updating cleanup criteria. The DEQ supports an approach similar to the AQD rule 230 process and will pursue including a similar process in future rule revisions.	Rule 4(10)

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			ensuring best available science continues to guide agency decision making. Duty to use best available science Our primary concern is that the administrative rules have been used by the DEQ as a reason for not fulfilling their statutory obligation to protect the Michigan public. The purpose of administrative rules is to facilitate the process of cleaning up sites of contamination and protecting public health. The rules cannot prevent the DEQ from fulfilling its statutory obligation. Therefore, the statute sets forth the duty to consider toxicity when approving a remedial action and a standard for assessing the toxicity of a chemical. The administrative rule should facilitate this process, but cannot limit the DEQ's obligation to both consider toxicity and follow the statutory formula for assessing toxicity. The current rule (as interpreted by the DEQ) and the proposed rule both contain a legal flaw in that they establish a cleanup criteria value based on best current available science but continue to strictly rely on that science and the resulting cleanup value even though there may be scientific consensus that the science was flawed or has been replaced with more recent or more robust analysis of toxicity. Therefore, even though the administrative rule contain one value it clearly no longer meets the statutory standard set for in MCLA 324.20120a(4) and should not be applied by the DEQ under 324.20120. In no case should an administrative rule be used when it conflicts with the authorizing statute. Current system of relying on administrative rule updates has placed the public at-risk As mentioned before, the DEQ staff did significant work updating the science behind the proposed cleanup criteria values. Somewhat disturbing are the number of instances in which there was a scientific consensus over 20 years ago that in order to be protective of public health a value should have been lowered. Unfortunately, our system of protecting public health has been undermined due to an underfunded DEQ and the significant obstacles to updating administrative rules. Our current system does	Rule needs to clarify identify when new standards would apply. The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation.	

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			not work and there is no reason to expect that will change. We note that it is not legally permissible to place the values in the rule and allow them to be "automatically" updated by referencing future action of another public body. Although referencing current standards is allowed, updates to those standards would need to go through the administrative rule process. <u>Alternative process</u> New science continues to deepen our understanding of the impact chemicals in the environment have on people. Therefore, we need a process which in a public and transparent manner incorporates new science into our decision making process. It should be noted that two other DEQ divisions (air and water permit issuance) have processes where the algorithms are included in their respective rules, but the final values are not, in order to allow new science to be incorporated and influence their decisions. Therefore, there is no legal reason the values need to be incorporated into the administrative rules. The recent example of an alternative process was recently unanimously supported by the stakeholder group formed by the DEQ to update the rules regarding the regulation of the emissions of air toxics. Under that program the algorithms are included in the rule, but the final values are not. In addition, when the DEQ toxicologists are going to review the science regarding the toxicity of a current or new chemical they make a public announcement to receive input from the public and regulated community (current notice attached as appendix A). This process ensures that the regulated community has ample opportunity for input before the DEQ exercises its professional judgment regarding the establishing a cleanup criteria (copy of proposed rule 230 attached, which is currently before the JCAR). <u>Current interpretation only allows science which weakens standards</u> If a responsible party believes the science has changed which justifies a weakening of the standard, the statute and rules allow the party to request a change in the		

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			standard under the provision for a "site-specific" cleanup. In that case, the DEQ performs the exact same analysis which is proposed above but without the same public notice and opportunity for public input. The advantage of the Rule 230 approach is that it allows a responsible party, a local unit of government or an individual to petition the DEQ to review the science regarding a chemical. The DEQ then, based on available resources, can schedule its reviews in an open and transparent process. <u>Rule needs to clearly identify when new standards would apply</u> In order to provide certainty to the public and the regulated community the rule should be very specific regarding when a cleanup can proceed under the current values and when the new values would apply to a remedial action. Parties responsible for many of these sites have been required to "diligently pursue" since they had knowledge of its facility status. In many cases, the requirement to diligently pursue cleanups has been abused or ignored. We suggest the rule limit use of the current values only to sites which meet both of the following provisions: • Sites at the stage of undertaking actual cleanup activities which will be completed with a discrete timeframe. We suggest that timeframe be 12 months. Inclusion of cleanup activities in a plan which may not be completed for years should not be allowed to use the current numbers. • Sites in which the change in values could significantly change the nature of the remedial action being proposed. Of course, all sites will need to use the new values when designing and implementing their due care requirements under the statute. *10-18-2016 Additional com*ments: On behalf of the MEC and the undersigned organizations, we would like to commend the DEQ and the staff of the RRD for their efforts to update the cleanup criteria for contaminated sites across the state. Unfortunately, many of the cleanup criteria values currently included in our administrative rules are not based on the best available science, and in		

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			some cases not even on science conducted in the last twenty years. Moving forward we think it is important that the rule both reflect best available science and have a better process for incorporating new science into decision making. At this time, although the proposed rule made a good faith effort to include best available science, it falls short in ensuring best available science continues to guide agency decision making. These comments for the most part reiterate the comments we submitted in September on the first version of the updated rules. However, the second version failed to address our primary concerns and we are therefore resubmitting our comments.		
Overall		MEGA	*9-13-2016*: The MEGA on behalf of its members listed below, submits these comments in opposition to the proposed Part 201 Rules in their present form. The most relevant member activity affected by the Part 201 Rules involves remediation of historical manufactured natural gas plant sites in Michigan. MEGA members Indiana Michigan, Michigan Gas Utilities (MGU) and Wisconsin Public Service (WPS) have such sites. These rules would also apply to future activities regarding utility sites, within their scope. Affected members have participated in the Part 201 stakeholder working group meetings with the MMA and the Chamber. MEGA members MGU, WPS and We Energies are filing joint comments in this matter as part of parent WEC Energy Group, Inc. (WEC). Indiana Michigan, a unit of American Electric Power (AEP) is participating in comments filed by Haley & Aldrich. MEGA supports and adopts the comments of WEC and Haley & Aldrich (on behalf of Indiana Michigan/AEP) as its own comments, regarding specific detailed provisions of the proposed rules and suggested revisions. MEGA also supports the extensive comments and written testimony of the Chamber group and the MMA. Administrative rules, properly developed and balanced, are vital to the effective implementation of complex regulatory measures. The Part 201 Rules should facilitate effective and reasonable investigation, remediation and	Comments received. See response to comments for Rule 2(h) definition of relevant pathway/ Exposure assumptions were revised 9-29-2016 that address the exposure for a workday and the assumptions for groundwater less than 3 meters below ground surface. The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation.	Rule 4(10)

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			closure of cleanup sites. In areas of great complexity, using a stakeholder working group process allows the narrowing of issues and provides a forum for interested party input. Thus, the Part 201working group process was an appropriate approach in developing the proposed rule changes. Unfortunately, as evidenced by the number and content of comments from the regulated community, there remains work to be done on these rules and the proposal is not ready for final implementation. MEGA realizes that not all desires of the regulated community will be adopted in rules; however, the issues raised are significant. Once the rules are implemented it will be much more difficult to make necessary changes and address practical issues. *10-18-2016 Additional comments*: MEGA on behalf of its members listed below, submitted comments in opposition to the proposed Part 201 Rules on September 13, 2016. The DEQ has proposed changes to the rule proposal and opened an additional public comment period regarding these changes. MEGA submits these additional comments due to the potential effect of the rules on one or more members. MEGA continues to take the position expressed in earlier comments the rule proposal is not ready for final implementation, even recognizing there are some positive revisions. Generally speaking, we support the use of sound science with stability in the applicable criteria and transparency in the process, to facilitate the closure of sites and encourage brownfield redevelopment. Particular rulemaking areas of continuing concern, needing further review and analysis, include clarity of the relevant pathway definition, use of generally accepted exposure criteria, avoiding unrealistic exposure assumptions (exposure hours; basement opening), application to closed facilities and approved plans and impacts on the state's redevelopment policy. MEGA supports the analysis and detailed review of the MMA and WEC, which have provided very detailed additional comments on the above issues and more. We do not wish to burden the agency with repetitive statements on the details, however, beyond stating our		

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			support.		
Overall		MMA KUHN	*9-13-2016*: The member companies of the MMA would like to support an update to the Part 201 environmental remediation rules based on sound science and administrative effectiveness, but we cannot support these proposed rules as written because they fail to achieve these goals as my testimony will make clear. Our member companies and many other stakeholders, including, but not limited to, regulatory agencies, local governments, regulated companies, academia, members of environmental and community organizations and the general public have been involved in this process of developing new criteria for over 5 years. The recent process has taken us through two extensive and exhaustive stakeholder involvement efforts including the CSA. I can tell you I have spent hundreds of hours in meetings talking about Part 201 criteria and processes, and these rules don't solve the problems that need to be resolved. In fact, in many cases they will lead to slower, less effective remediation of contaminated sites. These proposed rules ignore the CSA principles, such as sound science, transparency, and proper calibration of the generic criteria that were agreed to by those stakeholder participants, as well as many of their written recommendations. Unfortunately, these proposed rules are not just in conflict with the DEQ accepted CSA recommendations, but they are in conflict with what USEPA and all our neighboring states do (e.g., selection of toxicity values/classifications). Ridiculous exposure assumptions include 24-hour worker exposure when we still typically work 8 hour days. And by the way, the draft rules assume that a worker will be exposed to contamination while working 24-hours a day, 238 days a year for 20 years. Assumptions, including residents from childhood to adult, playing outside all day in short sleeves and short pants, for 8 months a year in Michigan weather. Also, residents living all day in the basement which is flooded for 32 years, with groundwater flowing through it like a river, constantly being	Comments received. <u>Significant calculation errors in rules must be corrected</u> The DEQ has revised criteria tables based on comments received and on-going stakeholder negotiations. QA/QC has been performed on the calculations and the rule tables. <u>Implementation of revised rules relative to existing facilities</u> The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation. The liability protection provided by an approved NFA Report or Closure Report is governed by the statutory provisions of section 20126(4)(e) and section 21323a(4)(d) of the act, and not these rules. The application of the provisions that provide what a person may be liable for is not changed by the proposed rules. <u>Demand on Limited Resources of the DEQ in evaluating site-specific criteria</u> The timeframes for DEQ review of site-specific criteria are governed by statutory provisions and not these rules.	Rule 46 Tables 1-4 Rule 50(7) Tables 1-3 Rule 4(10)

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			replenished with contaminated groundwater. Unfortunately, these faulty and questionable assumptions are found throughout these proposed rules and lead to criteria that are not reasonable, will slow the pace of remediation and discourage the reuse of brownfield sites. These rules include many complex algorithms and formulas coupled with exhaustive tables. Unfortunately, after over 18 months of work by the DEQ they continue to include mistakes in many of the tables and some glaring errors in some of the formulas. We also have serious concerns over brownfield development across the state and more specifically, in the inner city areas of most of our Michigan cities. MMA members feel strongly that these proposed rules will make property (brownfield) redevelopment much more challenging because they impose very low thresholds for determining whether a property is a Part 201 facility (below laboratory detection limits for many common substances such as petroleum products), much lower than before, which add more sites to the DEQs list and will further burden these properties with unnecessary Part 201 obligations. This is the opposite of the goal of the Part 201 re-evaluation effort to ensure that "the generic cleanup criteria be appropriately calibrated to ensure that sites of real concern are identified and addressed—and that sites with minimal potential for public health or environmental harm are not inadvertently brought into the Part 201 process" (CSA Final Report). These will be large and expensive new obligations to evaluate and address routinely and commonly occurring circumstances at nearly any previously used property without any real effect on protecting human health and the environment. The cost of brownfield redevelopment will escalate and the pace of redevelopment, especially in our inner cities, will be slowed and in some cases stopped. Our members have met extensively with the DEQ and offered solutions to these obvious problem areas as well as pointing to the practices of both USEPA and our surrounding states. Our discussions, for the most part, have been met by bemused stares and		

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			acknowledgements that there are some problems and qualified assurances that everything will be alright in the end. I'm not sure when this process will end so I'm not sure when everything will be all right. BASIS FOR CONCERNS: This analysis is one that considers the overall scope of the rules and how those rules will change the investigation, remediation, and closure of facilities under Part 201. An in- depth examination of the technical parameters and equations used to determine cleanup criteria and the assumptions the DEQ used was not undertaken. Rather, this written testimony provides a condensed list of those changes that will most likely impact the regulated community. Additionally, an appendix of 10 documents is provided within which are more detailed analyses and presentations relative to significant issues raised by the proposed changes in rules. It is clear that under the proposed rules the regulated community will face increased costs, additional time, and more intense agency scrutiny in investigating, remediating, and closing facilities under Part 201. Plus, because of the unrealistic assumptions used to develop the generic criteria that parties use to identify a Part 201 facility, there will be more sites to manage even though many of these new sites will pose minimal risks and should not be in the Part 201 process in the first place. This was one of the issues discussed in the CSA process, which wrote that it was "critically important" that the generic cleanup criteria be appropriately calibrated to ensure that sites of real concern are identified and addressed – and that sites with minimal potential for public health or environmental harm are not inadvertently brought into the Part 201 Process" (CSA Final Report). The proposed rules would result in such lower generic cleanup criteria due to these unrealistic assumptions, that they almost appear to be crafted so as to convince parties to eschew the use of these generic cleanup criteria in favor of more site-specific criteria with the burden on the regulated community to demonstrate that the criteria are		

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			sufficiently protective of the most sensitive receptor groups. This is reflected in the residential and non-residential generic cleanup criteria established for many hazardous substances for soil and groundwater which are much more restrictive. Overall, the proposed rules will greatly impact the cost and expediency in which facilities may be remediated and ultimately closed. The sad part about his is that the extra time and cost are driven by bad science and not by real environmental needs. OVERALL REVIEW AND SUMMARY. Overall, it is difficult to understand the policy objectives and necessity of these proposed DEQ rules. While it is understood that the Legislature directed the DEQ to review and update the cleanup criteria in the Part 201 amendments of 2013, the DEQ has gone well beyond this focused legislative directive. In addition, they have deviated significantly from the counsel and recommendations of a number of stakeholder groups that the DEQ itself publically stated their acceptance of. Instead, the proposed rules overhaul current program implementation rules in a way which is fundamentally inconsistent with the Part 201 program goals as embodied in the statute. While it is certainly appropriate to revisit the cleanup criteria to assure that human health is properly protected, including sensitive populations, there appears to be no substantive legal or environmental basis to overhaul the generic criteria in a way which is overly skewed toward uncommon and exaggerated exposures which are neither "reasonable and relevant" nor "which appropriately characterize patterns of human exposure", as the statute requires. Further, current mechanisms exist in Part 201 which provide for the management of specific hazardous substances where there is a necessity to do so. Nowhere in the confines of the statute or the Legislature's direction is there a basis for the overall program changes proposed by these rules. Simply put, the proposed program changes appear to be crafted towards granting DEQ unlimited discretion in		

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			mandating response activities where there is limited scientific or technical justification and in expanding the universe of "facilities" that come under its rules. In conclusion, these proposed rules eliminate predictability in the program implementation process and do not provide any level of certainty in the final result of a cleanup project. Without some level of predictability and certainty, it is fully anticipated that the regulated community will not invest in substantive cleanups towards closure and will, instead, "baby step" its way through the remediation process rather than implementing robust measures towards a predictable and certain outcome. Ironically, what is certain is that the increased number of "facilities" this proposed rule will add, plus the level of site-specific scrutiny and likelihood of predictable substantive disagreement with DEQ on technical issues, virtually guarantees an overwhelming demand on DEQ staff resources which the DEQ is ill equipped to manage. Due care will also grow as sites that were not a facility now meet that threshold because of absurd assumptions such as continuously flooded basements. All of these changes will not only lead to fewer clean-ups, but also threaten brownfield redevelopment because by adding complexity, irrationality and uncertainty as to what their obligations will be, buyers will likely think twice about investing in urban and previously developed properties in Michigan. Those with long memories will recall that the features being proposed are nearly the identical features of the remediation program from the old "Act 307" days where risk assessment principles were eschewed for "background or nondetect." Those features were rightly rejected by the public and repudiated by the Legislature in 1995. Now is not the time to turn our backs on nearly 30 years of remediation progress. The bottom line is that there is no legislative or substantive statutory support for most of these proposed program changes, and these program changes will, if implemented, have the exact opposite effect of moving		

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			parties towards expeditious and comprehensive cleanup goals. The member companies of the MMA urge the DEQ to consider and address each and every concern from all stakeholders in this process before these rules are promulgated. <u>Significant calculation errors in rules must be corrected:</u> In the short amount of time we have been afforded by the DEQ, we have uncovered some very significant calculation errors and input errors within the tables that must be corrected before the rules can be promulgated. Errors include incorrect maximum contaminant level drinking water criteria and errors involving the use of too many scientific digits. Checking the rules for errors has been made more difficult than should be due to the lack of transparency in the documents provided to us by the DEQ. [ties to efforts of the DEQ to delete the transparency rule]. In addition to fixing the errors the DEQ must invest adequate time to perform at least the basic quality assurance and control validation for all the proposed criteria, equations and tabulated values. The revised proposed rule package, including the Technical Support Documents and criteria calculators must be made available again for public comment prior to promulgation. The gross errors demonstrate why the DEQ should engage in further collaboration with other stakeholders to validate the proposed rule package. <u>Implementation of revised rules relative to existing facilities</u>: There is much concern within the regulated community as to how the DEQ plans to implement the new rules. For example, how will the rules be applied to facilities with an approved NFA? NFA in process? Interim response activity completed? The implementation of the new rules on these and other scenarios will have a significant impact on the regulated community. In addition, we understand that the draft rules are being used by DEQ staff now, as if they are applicable. This is inappropriate. Recommended Action: Some have suggested inserting language into the rules explaining how they will apply.		

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			Back in 2002 when the rules were amended, the DEQ issued guidelines pursuant to the Administrative Procedures Act that addressed implementation issues associated with the rules. Those guidelines are instructive. For these new rules, the DEQ should develop similar guidelines with input from the regulated community and the public. Clarity regarding implementation is key. Also, DEQ staff should not apply the draft rules before they are promulgated. <u>Demand on Limited Resources of the DEQ in evaluating site-specific criteria</u>**.** An analysis of site-specific criteria for facilities will take additional time to review by the DEQ given the additional factors and considerations that must be evaluated for each facility. This additional analysis and unnecessary scrutiny means that there is an increased likelihood that disputes will arise between the DEQ and regulated parties. The current timeframes for the review of response activities, remedial action plans, and requests for closure will be greater under the proposed rules. Regulated parties will thus have to ensure that unnecessarily exhaustive effort is made to evaluate site-specific criteria and future uses of a property in order to demonstrate the "correct" application of criteria to a specific site. Impact on the Regulated Community: The turn-around time for DEQ approval for response activities and requests for closure will be much longer given the intricacies involved in evaluating site-specific criteria and the expertise that such review requires. The potential for dispute between the DEQ and regulated parties will be far greater, resulting in increased costs and delays for the regulated community. *10-18-2016:* While MMA would like to support an update of the Part 201 environmental remediation rules based on settled science and administrative effectiveness, we cannot support the proposed rules as written because they fail to achieve these goals. The following specific comments illustrate numerous instances of how the proposed rules ignore the CSA principles, such as settled		

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			science, transparency, and proper calibration of the generic criteria that were agreed to by those stakeholder participants. Specifically, MMA is disappointed that very few of its recommendations were considered in this October draft even though its members have been very engaged and constructive in providing its input and experience in conducting property due diligence and environmental remediation throughout the country. For example, we continue to feel the alternative table of toxicological inputs provided in our September 13, 2016, comments to the DEQ as Appendix #1 reflects the best sound and settled science, consistent with the CSA recommendations. We also feel that most our technical concerns with the DEQ's April 2016 draft proposed Rules package remain in this October 2016 draft rules, i.e., Appendices # 2 through 9 of MMA's September 13, 2016, comments to the DEQ. Therefore, while the DEQ has made an extremely limited number of changes to its April 2016 draft proposal in the current October 2016 proposal, the changes do not address the threshold issues MMA has with the DEQ's proposed Rules package and the entirety of MMA's September 13, 2016 comments should be considered as being resubmitted.		
Overall		MOGA	*9-13-2016*: MOGA supports the testimony and comments on the proposed Part 201 rules changes submitted by the MMA and the Chamber, and would like to further highlight our concerns related to the proposed rules package. Comments specific to Rule 2(h). The proposed 201 rules must address and correct the erroneous and overly conservative assumptions, formulas, and algorithms used in developing the proposed criteria (See MMA testimony) and should rely on primary sources of toxicity values consistent with the USEPA. Lastly, we support objective, generic cleanup criteria for hydrocarbon cleanups that avoid the complexity and subjectivity of the proposed rules. The latter leads to	Comments received.	None

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			uncertainty and inconsistency in applying the regulation. We urge the DEQ to consider and address the concerns of MOGA, MMA and the Chamber in this process before the final rules are promulgated. *10-18-2016 Additional comments*: MOGA would like the comments submitted by our organization on September 13th, 2016 in reference to the Part 201 Proposed Clean Up Criteria rules to be considered for the record towards the 2nd revision of the draft proposed part 201 rules as our concerns remain.		
Overall		MPA/MACS	MPA/MACS has participated in industry stakeholder groups related to the proposed revisions over the past several years. While corrective action at a majority of our member sites is regulated under Part 213 of the NREPA, the Risk Based Screening Levels (RBSLs) applicable under Part 213 are defined as: the unrestricted residential and nonresidential generic cleanup criteria developed by the DEQ pursuant to Part 201. Thus, revisions to the Part 201 generic cleanup criteria will significantly impact corrective action undertaken by MPA/MACS members. MPA/MACS cannot support the October 5, 2016 version of the proposed revisions to the Part 201 administrative rules and the associated generic cleanup criteria. The proposed revisions will have a significant adverse financial impact on MPA/MACS members without a demonstrable benefit to public health or the environment. The substantial increase in corrective action costs associated with compliance will drain scarce resources that could otherwise be used for meaningful correction, capital improvements and growing Michigan's economy. Moreover, these increased costs will unnecessarily threaten the long-term viability of the Part 213 cleanup fund. On September 13, 2016 the MMA submitted its comments and recommendations related to the proposed revisions. MPA/MACS participated in the industry stakeholder group facilitated by MMA which reviewed and analyzed the proposed revisions. MPA/MACS supports and adopts MMA's comments and	<u>Comment C. Application of generic criteria</u> The rules of concern for these comments were removed 9-29-2016. <u>Comment D. Novel equations beyond carcinogen and noncarcinogen.</u> See response to comments for Rule 6 - Overall	None

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			recommendations, in particular, comments C. Application of generic cleanup criteria, and D. Determination and establishment of Generic Values. In addition, MPA/MACS supports and adopts the comments submitted by PM Environmental on September 13, 2016. MPA/MACS request DEQ to seriously consider the comments cited above and received from other stakeholders prior to final promulgation of the proposed revisions.		
Overall		PM	The proposed rules attempt to avoid the rule making process for developing and making changes to certain criteria. The proposed rules will have a significant effect on those individuals and business that plan to purchase property with due care obligations due to contamination resultant from previous property owners through Environmental Site Assessment (ESA) and BEA process. However, prospective purchasers of real property must first determine if a property is a facility under Part 201. Under the proposed Administrative rules, reliance upon generic criteria to determine whether a site is a facility may subject a purchaser to liability for existing contamination resultant from previous property owners if the DEQ determines that different site-specific criteria apply to a property than those defined in the ESA process. To ensure full liability protection for a prospective purchaser under Part 201, a BEA and Due Care Plan will require a site-specific analysis rather than reliance on generic criteria to determine whether a site is a facility. Then a prospective purchaser may also be required to perform response activities under the proposed rules to address the new exposure standards presented in the proposed administrative rules package. Preparation of BEA's and Due Care Plans will cost significantly more (many thousands of dollars). Specialized individuals will need to be retained to ensure that a site-specific analysis is done correctly to provide liability protection for existing contamination under Part 201. Site-specific analysis will require consideration of any/all future uses of a property and not just the intended use for	The rule provisions of the initial concerns [Rule 4(5), (6) & (7)] were removed 9-29-2016. See response to comments for Rule 40. Rule 6(19) was removed 9-29-2016.	No further rule revision is required.

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			which the property is being purchased. Due Care Plans for existing facilities and prepared prior to implantation of the proposed administrative rules will need to be re-evaluated and, in many cases, response work will be necessary to comply with new due care obligations. Future brownfield redevelopment in Michigan will be likely reduced significantly due to new obligations and requirements resultant from the proposed administrative rules. The proposed administrative rules eliminates the statutory requirement for the DEQ to be transparent (i.e. by removing Rule 299.40). The elimination of transparency, combined with the proposed rule to allow the DEQ to make changes to criteria outside the rulemaking process (R 299.6(19)) allows the DEQ unlimited authority to create new criteria with zero oversight, review, or outside input. Allowing the DEQ unlimited and unchecked authority to create criteria without rules and transparency will create undue burden on property owners and expose the DEQ to litigation. In general, the proposed administrative rules appear to utilize the most conservative data for generic input values for the equations used to generate generic cleanup criteria. Inappropriate data is selected from peer reviewed and published sources, but evaluated and applied in ways that were not intended for the selected data (e.g. apples to oranges). It is understood that the statutory requirements of 2013 Part 201 amendments directed the DEQ to review and update the generic cleanup criteria. However, the proposed administrative rules go well beyond the limited statutory directive. The proposed administrative rules overhaul current program implementation in a way which is fundamentally inconsistent with the Part 201 program goals as embodied in the statute. Additionally, the proposed administrative rules provide the DEQ unlimited and unchecked authority to create and enforce criteria outside the previously defined rulemaking process. The proposed administrative rule changes will, if implemented, effectively stop property owners from		

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			implementing response activities to achieve facility cleanup goals as the new goals (generic cleanup criteria) will be effectively be not attainable using technological and economically feasible response activities.		
Overall		WEC	*9-13-2016*: All remediation and redevelopment activities, inclusive of already completed, current and future clean-up actions, may be impacted by the proposed rule changes. The significant uncertainty and increased costs created by the proposed rules is a concern for utility remediation and redevelopment at these sites. The proposed rules would be expected to complicate and increase requirements for future plant decommissioning activities, as well as making property redevelopment more uncertain and more costly. WEC Energy Group utility subsidiaries have serious concerns with the proposed Part 201 rule revisions. As drafted, the proposed rules will have profound and lasting impacts on investigation, remediation, and closure of facilities regulated under Part 201. In fact, the proposed rule revisions would have far ranging affects, and would be detrimental to the range of institutions and interests that have a stake in clean-up of historically impacts properties including local governments and communities, brownfield developers, realtors, and banking and lending institutions. We think there are more reasonable rule revisions that should be considered, and would support a more workable, consistent and predicable state remediation and redevelopment program. Overall, we find the following to be the key issues related to the proposed rule: 1. The proposed rules remove the requirement that the DEQ examine only "reasonable and relevant" hazardous substance exposures, a requirement mandated by the Part 201 statute itself. Instead, "potential future" exposures replace "reasonable and relevant" exposures, creating a limitless universe of factors which regulated stakeholders must consider in formulating a remediation plan; 2. The proposed rules create unpredictability in the	*10-17 2016* Comments 1. See response to comments for Rule 2(h) – relevant pathway definition. 2. It is not clear what process agreed upon by the CSA process was not followed and what rule revisions should be considered. 3. It is not clear from the comment what specific exposure assumptions should be reviewed or what rule revisions should be considered. 4. The DEQ has addressed the implementation concern with a proposed effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation. The liability protection provided by an approved NFA Report or Closure Report is governed by the statutory provisions of section 20126(4)(e) and section 21323a(4)(d) of the act, and not these rules. The application of the provisions that provide what a person may be liable for is not changed by the proposed rules. 5. It is not clear from the comment what in the rule process need further review and what rule revisions should be considered.	Rule 2(h) Rule 4(10)

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			administrative process by forcing remediation stakeholders to guess at whether or not generic or site-specific criteria will be applicable at any particular site of environmental remediation; 3. The proposed rules do not provide for certainty in achieving closure, and once closure is obtained, the new rules leave open the likelihood that a previously granted closure will be re-examined. This substantially diminishes the incentive to invest in the pursuit of closure. This kind of change would be harmful to the objectives of the remediation program, and ultimately to the goal of redevelopment; 4. The proposed rules essentially eliminate self-implemented remediation plans by creating unnecessary administrative barriers to the use of generic criteria - which were formerly considered safe for all uses and a fundamental premise of Part 201. If a remediation stakeholder must seek DEQ concurrence that the site-specific use of a particular facility meets the DEQ's expected exposure assumptions, then every cleanup essentially becomes a site-specific cleanup. This completely vacates the generic cleanup process and reverses reliance on Part 201 safe exposures assumptions; 5. Requiring DEQ review and approval of all remediation activity as contemplated by the new rules will result in increased time and resource commitments by both DEQ and regulated stakeholders. There is nothing in the rule record that justifies the scope of such a restructured remediation and redevelopment program. Additionally, DEQ would need additional program and staffing resources in order to implement this type of program; 6. The proposed rules eliminate necessary governmental transparency in formulating remediation standards. DEQ would no longer be required to make available to the public the basis for calculating remediation criterion, which is contrary to the goal of the CSA Workgroup process. WEC Energy Group has participated in the Part 201 stakeholder work group meetings of the MMA and Chamber. As a MMA member, we have remained		

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			engaged in the review and analysis of the Part 201 rules. Attached to this letter is testimony prepared by MMA on the Proposed Part 201 Criteria Rules. That testimony provides an additional evaluation and summary of concerns related to the Part 201 rule amendments. We generally support the analysis, conclusions and recommendations contained in that testimony and hereby incorporate those comments by reference into this letter of official comment on the Part 201 rules. The company is also a member of the MEGA. That organization is also submitting comments on the proposed Part 201 revisions consistent with the interests of its utility members. Due to expected revised rule impacts on utility operations and remediation activities, we support the comments submitted by MEGA. Considering the gravity of these impacts and the marginal stated benefit of the proposed rules, we sincerely believe that the proposed rules should be substantially revised before further attempts are made to promulgate these rules. Detailed comments follow, including specific recommendations for modifications to the proposed rules. In addition to the other issues raised in this letter, it is important to consider the significant effect the proposed rules will have upon brownfield redevelopment projects in Michigan. Michigan has a rich brownfield redevelopment history. These efforts are facilitated through environmental liability exemptions obtainable under the BEA program established in Part 201 and defined in MCL 324.20126. In order to establish an exemption to environmental liability, a party must demonstrate that a property is a "facility" under Part 201 and describe the general nature and extent of contaminants which characterize the facility's status. As was previously expressed in this letter, the definition of what is a "facility" under the proposed rules may be somewhat of a sliding scale based upon whether or not the DEQ agrees that the use of generic cleanup criteria is appropriate, considering site-specific conditions. Currently, generic cleanup criteria establish the objective		

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			"baseline" upon which facility status is measured. If the DEQ determines that site conditions make the generic criteria inapplicable, the question of what is a facility becomes subjective. These determinations of Part 201 applicability and scope are critical in establishing expectations of liability protection. The proposed rules allowing for such a wide range of agency discretion will result in uncertainty in the real estate marketplace and will almost certainly result in fewer transactions in situations where parties cannot be entirely certain of remediation obligations and residual liability. In addition, Due Care Plans which are utilized in brownfield redevelopment projects will need to be revisited. Individuals redeveloping contaminated facilities may need to undertake costly response activities in order to demonstrate to the DEQ's satisfaction that an unacceptable exposure does not exist. This cost of "proving a negative" will deleteriously impact brownfield redevelopment. We believe that this is an unintended consequence that should be avoided as part of the proposed rule changes. The proposed changes to the Part 201 Rules will have significant impacts on WEC Energy Group utility subsidiaries and the regulated community, without any significant gains in environmental benefit. These utilities, like many regulated entities, have a strong environmental protection ethic. Utilities also necessarily seek predictability in regulatory processes and certainty in outcomes. The proposed revisions to Part 201 remove predictability in process and certainty in outcome. We can find no legislative or policy basis for the significant proposed program changes which remove clarity, objectivity, predictability in process and certainty in outcome. WEC Energy Group utility subsidiaries request that the DEQ carefully reconsider the impact of the proposed rule revisions. *10-17-2016 Additional comments*: This letter is primarily directed to address the recent revisions to the proposed administrative rule changes for Part 201. Since our last comment submittal, it appears that significant progress		

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			has been made in several key areas. However, many of the comments and concerns articulated in our prior letter of September 13, 2016, remain unaddressed by the agency. The recently revised proposed rules contain some positive revisions and we appreciate that DEQ has agreed to continue discussions about the proposed rules and related consequences to remediation and redevelopment activities. Specifically, the changes to Rule 4 protecting the applicability of the self-implementation program and generic criteria, as well as the criteria revisions to Rules 26 and 27 are common sense amendments which will avoid significant unintended consequences. Additionally, the modification to Rule 40, which reinstates the transparency rule, as well as Rules 46 and 49 are likewise commendable adjustments in position to allow the rules to accomplish their intended purpose. However, while we appreciate the effort of DEQ staff to address the issues articulated in our September 13, 2016 letter, significant areas of concern with the proposed Part 201 rules remain. These issues are generally identified as follows: 1. The revisions to the proposed rules still include a definition of "relevant pathways" which impermissibly deviates from the definition of "reasonable and relevant" under the statute. 2. The proposed rules reflect an approach to establishing new remediation criteria that does not follow the process previously agreed upon by the CSA work group. 3. The revised proposed rules fail to follow accepted exposure assumptions and criteria methodologies recognized by USEPA and other states. Many of the specific constituent concentrations in the proposed rules are driven by exposure assumptions that continue to be difficult or impossible to replicate under known or reasonably anticipated conditions. 4. The revised proposed rules are unclear as to how they will be applied to regulated facilities. 5. The revised proposed rules establish unnecessary barriers to environmental and economic redevelopment		

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			in Michigan. WEC Energy Group is a member of the MMA and the MEGA. Those organizations are submitting comments on the revised proposed rules and we incorporate by reference the recommendations and comments as expressed by those organizations. To provide some greater detail on the above referenced concerns, we include detailed comments in the remainder of this letter. One of the significant challenges of the proposed rule changes is the fact that there is no expression within the rules as to whether or not the rules are to be applied only to currently open facilities undergoing remediation or all facilities, including those previously closed. It is also unclear whether or not the new rules will apply to currently accepted Remedial Action Plans, Response Activity Plans, and pending requests for No Further Action letters. It would seem reasonable to specify in the rules that No Further Action reports submitted prior to the implementation date of the new rules will utilize the old standards and the old rules. Further, it would seem fairly straightforward to stipulate that Remedial Action Plans and Response Activity Plans will likewise be unaltered by the new rules. It seems reasonable that those parties who have substantially invested to the point of plan approval should realize some benefit of that investment with a predictable outcome. Michigan has been a national leader in the effort to redevelop impacted property, restoring prior blighted brownfields into dynamic engines of economic and environmental progress. One of the hallmarks of those initiatives is the predictability in environmental status realized by the new property owner. This predictability has several facets – one is economic, in that a property owner knows what their cost of acquisition and due-care management will be, typically upfront. A second facet is environmental predictability. Under the old system a redeveloping property owner could have a comfort level that their environmental management of a property would have some stability and predictability in process		

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			and outcome. The current proposed administrative rules will result in outcomes that are impossible to predict, as redeveloping property owners may purchase non-residential property, only to have the DEQ assert that residential property uses are a relevant pathway and, thus, an entirely different remediation and due-care standard will apply. This will result in significant, unanticipated expense to comply with shifting due-care priorities, including those priorities that may change with future alterations in criteria standards. The DEQ has indicated that they will require all property owners currently functioning under existing or approved due-care plans to revise those plans under these proposed rules and, in many cases, implement environmental control features, including expensive engineered controls, to meet the new criteria. It seems unlikely that Michigan will maintain its position as a place for new development investment with these sliding standards for criteria, especially when those standards necessitate environmental remediation costs. Put another way, the focus of the new rules essentially creates little distinction between remediation obligations of liable parties and those non-liable persons seeking to simply redevelop the property in a way that is protective of human health. While we appreciate the willingness of the DEQ to remain engaged in discussions over many of the areas of concern, it appears clear that there are still significant issues to resolve. The revised proposed administrative rules still create uncertainly in implementation and lack predictability in final result. While we share the DEQ's objective that environmental standards should be protective of human health and the environment, they also must reflect appropriate scientific approaches that reflect practical exposure assumptions. WEC Energy Group is confident that if additional dialogue could take place prior to promulgation, many of these issues could be resolved. Many of the standards and rules currently proposed can be implemented without further objection. However, in those areas where clarity is		

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			currently lacking, it should be our mutual approach to achieve clarity of method and purpose prior to implementing those rules. Accordingly, WEC Energy Group and its utility subsidiaries request that the DEQ carefully reconsider the impact of the proposed rule revisions. We look forward to your response to the issues addressed in this letter, including any that are required response pursuant to the Michigan Administrative Procedures Act.		
		ZAYKO	The TSD for soil ingestion cherry picks data to support a preconceived value for soil ingestion. The methodology used in this, and other, TSDs is the exact opposite of sound science. An example of picking supportive data and eliminating data that is contrary to a preconceived conclusion (i.e. the definition of bad science) is found on page 19 (Section 2.3.3) of the attached soil ingestion TSD: The values predicted by the modeling (i.e. Wilson et.al. 2013) are substantially lower than those based on fecal tracer studies; thus, this study was not considered further. This TSD (all TSDs) should be (must be) redone by an independent third party since the DEQ has demonstrated that it is only interesting in using data that supports their preconceived conclusions that input values must be such that criteria are as close to zero as possible.	The TSD documenting the selection of the soil and dust ingestion rate values is thorough, comprehensive, and scientifically sound. SRC was hired by the DEQ as an independent third party to evaluate and select the generic exposure assumptions for development of the generic criteria. Each of the soil ingestion values identified and considered by SRC was evaluated using the DQOs recommended by the CSA and TAG2. The DQO evaluation process allowed SRC a consistent process for selecting and documenting the best available value as the generic assumption. Details of the DQO evaluation can be found in the TSD entitled "MDEQ Part 201 Generic Exposure Assumption Values Update; Technical Support Document; Soil and Dust Ingestion". SRC evaluated the Wilson et al. (2013) paper using the DQOs in the same manner that the other new studies were evaluated. The Wilson et al. (2013) paper reported the results of a probabilistic model designed to estimate soil ingestion rates from hand-to-mouth activity. Based on SRC's comparison of the DQO evaluations, it was determined that the USEPA soil and dust ingestion rates were the best available values. As a result, the USEPA recommended soil ingestion rate values were selected for the generic parameters. The thorough and scientifically sound process	None

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				documented by SRC is misrepresented by the commenter. The DEQ is satisfied with the evaluation process and final soil and dust ingestions rates selected by SRC and is not planning any further work related to these or any other exposure parameters.	
Overall		MMA	Validity of adopted and process for TDLs.	This comment was further discussed as part of the Phase II Stakeholder Process. The DEQ will remove the TDLS from the promulgated criteria tables. The DEQ will develop TDLs in accordance with MCL 324.20101(1)(bbb) and not promulgate the values as part of the criteria rule process. In accordance with the statutory provisions the TDLs will be published, and in accordance with the statute when a health-based value is less than the TDL the TDL is the criterion. [MCL 324.20220a(10)]	Rule 46 Tables 1-4
Significant Figure		MMA	The proposed criteria appear to have more significant figures than are appropriate. The number of significant figures should not be more than that in the least significant input to the criteria calculations (standard convention). In most instances, the toxicity values used in the calculations have only 1 or 2 significant figures. The DEQ should thoroughly review the number of significant figures in its input values relative to the source documents. The number of significant figures in its calculated criteria should be limited to the standard convention of displaying no more significant figures in the final value than are available in the least significant input parameter.	In August 1992 the Part 307 Advisory Group reviewed the DEQ "Rounding Off Policy". At that time the DEQ's position was that the numerical result of the calculation should have no more significant figures than any of the values involved in the calculation. Stakeholders concluded that rounding in this manner was not appropriate in establishing criteria, raising concerns regarding significant differences resulting from rounding down (e.g., a calculated criterion of 140 becoming 100). Stakeholders concurred with the DEQ's proposal that criteria would be presented in 2 significant figures. Since that time, the cleanup criteria have been presented as 2 significant figures. This approach is also consistent with USEPA RSLs (using scientific notation to two significant digits including MCLs) and many other states. The criteria remain in 2 significant figures. Further discussion of this concern as part of the Phase II Stakeholder Process has resulted in the revision in the Groundwater Criteria Table, listing the SDWS and the national secondary drinking water regulations in units of milligram per liter (mg/L).	Rule 46 Table 1 Rule 49 Footnote (A) & (E)

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Conceptual Site Model		MMA	Clarification of residential and nonresidential scenario assumptions (i.e., need clear "CSM"). The June 2016 Resource Materials for Cleanup Criteria and Screening Levels Development and Application is intended to explain the development of the criteria. It is missing the CSM that is necessary for the proposed criteria to comply with the CSA requirements. The CSM is a description of the intended receptor and how that receptor may become exposed to hazardous substances from different pathways in varying amounts in their idealized environment, such as a place of work or residence. Without the CSM is it not possible to determine that the criteria are appropriately calibrated to ensure sites of real concern are identified and addressed. Four significant errors related to exposure factors have been identified, exposure time, the soil adherence factor, dermal absorption efficiency, and exposure frequency. The final TSD must establish the CSM. Changes for the 4 errors must be incorporated for the current draft rules to be perceived as "reasonable and practical" while still protective of public health.	Generic criteria represent a reasonable maximum exposure (RME) for residential and nonresidential scenarios. This does not result in a single scenario of assumptions for all pathways. For example, the scenario for nonresidential criteria for soils is protective of an outdoor worker, while the nonresidential criteria scenario for vapor intrusion is protective of an indoor worker. There is not a direct calibration from the generic assumptions to a scenario. To allow the use of generic criteria to be protective for the majority of scenarios the criteria are developed using conservative assumptions and factors. The DEQ, in line with USEPA Risk Assessment Guidance, uses the RME as the highest exposure that is reasonably expected to occur at a site. The RME is a combination of high-end and central tendency values. Consistent with USEPA guidance, protecting public health with the RME approach addresses the exposure of all segments of the community, ensuring an adequate margin of safety for most of the potentially exposed. As part of the USEPA RSL process CSMs are developed site-specifically for comparison to the generic RSLs assumed site conditions to determine their applicability to the site. The exposure route and receptor(s) that the USEPA RSLs are protective of are identified, but an exposure-specific activity or behavior is not. This is consistent with the DEQ's development of criteria and screening levels. The CSM example provided for CSA TAG-2 discussions is not applicable to the DEQ's development of the generic cleanup criteria. This was discussed further as part of the Phase II Stakeholder Process. The DEQ will include CSMs, where applicable in the Cleanup Criteria Resource Materials.	None

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1	(f)	PM	Definition of "best available information": While the rule states "but is not limited to, any of the following" the three data sources listed imply that the DEQ did not use Michigan specific data sources. CSA recommendations repeatedly states that Michigan specific data should be used to develop generic criteria. The subdivisions should be renumbered to add (ii): Databases of Michigan-specific information generated and/or maintained by the State of Michigan, the Federal Government, and/or public/private funded research.	The data sources identified in the definition are broad enough to include the proposed additions and the rule was not changed in response to this comment.	None
1	(f)(ii)	PM	United States environmental protection agency should be spelled using Proper Noun capitalization.	This change was made 10-5-2016 with LSB review.	No further rule revision.
1	(f)(ii)	PM	Subdivisions (ii) & (iii) should be updated to the following: Risk assessment guidance and databases maintained by various agencies and/or departments of the United States, including but not limited to: USEPA, United States Department of Health & Human Services, United States Geological Survey, and the United States Department of Commerce.	The data sources identified in the definition are broad enough to include the proposed additions and the rule was not changed in response to this comment.	None
1	(j)	PM	Definition of "Csat": The last sentence should read: As used in these rules Csat is a theoretical threshold above which a hazardous substance may exist as mobile NAPL. The terms migrating NAPL, mobile NAPL, and residual NAPL should be defined in Rule 2.	Rule 2(m) states, a term defined in the act has the same meaning when used in these rules; these terms are defined in Part 201 and Part 213. The saturation that is being referred to in the definition is a single compound solubility limits in water; therefore, Csat is a theoretical concentration for a single compound that is a threshold above which NAPL may be present in the soil. There is no implication in the calculation or definition for the actual degree of NAPL saturation in the soil pore space and more importantly, this concentration gives no indication of whether the NAPL present may be residual, mobile, and/or migrating. In other words, the result of the Csat calculation is soil that is in equilibrium with water that is at its solubility limits with a single compound – concentrations below the threshold can be theoretically attributed to partitioning of the chemical and therefore NAPL may not be present. Concentrations above this threshold for a single compound cannot	None

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				theoretically be attributed to the chemical partitioning out of a NAPL and NAPL may potentially be present at the location which would require further evaluation for the application of generic criteria.	
1	(l)	PM	Definition of "facility specific": The phrase "DEQ approved" should be struck from the first sentence. The generic criteria, including facility specific criteria, should not need formal DEQ approval. Site-specific criteria required DEQ approval per MCL 324.20120b.	The use of facility-specific input values to generate generic criteria requires the use of DEQ-approved values. Those values are included within the proposed Rules 7 and 27. No further DEQ approval is required.	None
1	(n)	PM	Definition of "increased cancer risk of 1 in 100,000": While I do not disagree that the exact length of a theoretical lifetime (70 years) used in calculations be removed from this definition, the term lifetime should be modified by the adjective "theoretical" since every lifetime is uniquely different.	This is now Rule 1(o). The 78 year lifetime used for cancer risk calculation is based on data, not theory.	None
2		PM	The following definitions should be added: "migrating NAPL" means that term as it is defined in section 21302; "mobile NAPL" means that term as it is defined in section 21302; "NAPL" means that term as it is defined in section 21303, "Residual NAPL" means that term as it is defined in section 21303.	Rule 2(m) states, a term defined in the act has the same meaning when used in these rules; these terms are defined in Part 201 and Part 213. The definitions were not changed in response to this comment and remain consistent with statutory language.	None
2	(a)	MMA KUHN	The definition of land or resource use restriction does not properly track the recent changes in Part 201. The DEQ has proposed changes to the methodologies by which facilities may be closed using land or resource use restrictions. The proposed rules eliminate the definition of an "institutional control" and have revised the definition of "land or resource use restrictions." Those restrictions would include restrictive covenants, conservation easements, court approved settlements, institutional controls, state laws or zoning ordinances, or "alternative instruments" approved by the DEQ. It is unknown at this time MDEQ's willingness to accept these instruments to close a facility or what the MDEQ will require in terms of the content of such measures particularly in light of the changes made to the vapor intrusion criteria.	The definition is consistent with the statutory provisions, MCL 324.20121. The rule was not changed in response to this comment and remains consistent with statutory language.	None
		PM	Land use restrictions do not reduce exposure. Land use		

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			restrictions prevent, limit or control activities. If activities are limited, the potential for exposure is reduced. The updated wording makes the simple concept complicated, vague, and easily misunderstood. The text should remain unchanged.		
		PM	To remain consistent with Part 201 definitions and terminology, the word facility should not be replaced with property in the main part of the rule (2)(a) not in subrule (2)(a)(iv).		
		PM	Add the following: (vii) An alternate institutional control which may be written confirmation from the State Department of Transportation or local unit of government that there are no current plans to abandon a right of way owner or controlled by the State Department of Transportation of local unit of government.	The DEQ determined this did not need to modified to include this additional provision as the DEQ considers this alternate instrument to be covered under the provisions of Rule 2(a)(v) and MCL 324.20121(9), and MCL 324.21310a(4).	None
2	(f)	PM	Definition of "reference dose": Reference dose is used for both oral and dermal exposure. Replacing "intake of" with "oral exposure" is not appropriate. Therefore, keep the proposed stricken phrase "intake of" and do not replace with the proposed phrase of "oral exposure to".	The proposed subrule was modified in response to this comment.	Rule 2(f)
2	(h)	MMA KUHN	The definition of relevant pathway has been revised to deviate from the statutory reasonable and relevant to one that may potentially occur at a facility in the future. No guidance is provided on what may constitute a "potential" future use. There is no limit as to the factors or duration. It can be assumed the DEQ will likely approach each facility as having the most conservative potential future use (i.e., residential). The revision conflicts with statutory provisions that allow for the use of alternative institutional controls. DEQ will likely only accept the most robust institutional controls as acceptable to eliminate or mitigate an exposure pathway. The changes from the first sentence should be deleted and the entire third sentence should be deleted. Replace the last two sentences with clarifying language based on analogous sources like USEPA RAGs. In addition add language to clarify when a pathway is relevant to a particular media in Rules 10, 20 and 26. Revised rule language provided.	The DEQ has used the terms "relevant pathway" and "applicable criteria" with the implementation of generic criteria since 1998. These terms were defined in the 2002 rules. Statutory language states that the DEQ shall utilize only reasonable and relevant exposure pathways in determining generic human health exposure risk assessment assumptions. It does not define relevant exposure pathways. "Exposure pathway" is a defined term used in human health risk assessments; the relevant pathway definition is consistent with the standard exposure pathway definition. The "applicable criteria" definition was deleted because the term was not used in these rules, and conflicted with the way the term was used in Part 213. Even though this definition was deleted the	Rule 2(h)

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		CONSUMERS	*9-13-2016*: Rule 2 (h) - "Relevant pathway" means an exposure pathway that has a reasonable potential to occur and is relevant at a facility including potential future uses. The components of an exposure pathway are a source or release of a hazardous substance, an exposure point, and, if the exposure point is not the source or point of release, a transport medium. These components are expected to be present such that human or nonhuman receptors have a reasonable potential to be exposed to a hazardous substance from a source or release. The existence of a municipal water supply, exposure barrier, or other similar feature does not automatically make an exposure pathway irrelevant. The dual requirements that pathways be both "reasonable and relevant" is based expressly on the statutory provision for developing generic criteria (Section 20120a(3)). Why is the DEQ deviating from this requirement? The definition of a "relevant pathway" in the proposed rules has been revised from the "reasonable and relevant" exposure pathway that currently exists at a facility to one that may occur at a facility in the future. This gives the DEQ the ability to compel those conducting response activities to evaluate not only current exposure pathways, but an unlimited universe of future exposure pathways based on "potential" future uses. The revised definition also assumes that the components of an exposure pathway are expected to be present at a level where there is a "reasonable potential" for both human and nonhuman receptor exposure. In other words, the regulated party must disprove, to the DEQ's satisfaction, the existence of an assumed pathway. *10-18-2016*: Comment resubmitted	term has value in describing the relationship of criteria and a relevant pathway. This concern was discussed further as part of the Phase II Stakeholder Process. The proposed revision to the relevant pathway definition to provide clarity that a relevant pathway was not limited only to current use and existing exposures was determined not necessary. The existing definition includes "there is a reasonable potential" and potential is defined as "capable of being but not yet in existence". The definition will revert to the existing language. The DEQ will continue to implement the language as there is a reasonable potential for exposure based on existing and reasonably anticipate future activities.	
		PM	The proposed edits change the definition of relevant pathway such that all exposure pathways are always relevant for nearly all land within the State of Michigan, including those that do not meet the definition of a facility (Part 201) or property (Part 213). There must be the "potential" for exposure to a hazardous substance for an		

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			exposure pathway to be a relevant pathway. Update the first sentence as follows: "Relevant pathway" means an exposure pathway that has a reasonable potential for exposure to a hazardous substance to occur at a facility including potential future uses. Assumptions, expectations, and policy commentary do not belong in promulgated rules; therefore, the 3rd sentence should not be added.		
		MCC	*9-13-2016*: The rules would redefine the "relevant pathway" of exposure by eliminating the standard for reasonable potential for exposure" and adopting a reference to "potential future uses", which are undefined and unlimited in nature. If the application of this rule does not respect institutional controls which may limit future exposure pathways, persons implementing response activities would be either required to achieve the most conservative/protective levels possible or to enact very restrictive covenants. *10-18-2016 Additional comments*: We were glad to see that this standard has been revised since the initial proposal, but we still remain concerned about potential interpretations of this definition that would not allow for institutional controls.		
		GLELC	5. <u>DEQ should better define the scope of application of its definition of "relevant pathway".</u> Proposed Rule 2 provides an improved definition of "relevant pathway" by adding the phrase "potential to occur at a facility including current and reasonably anticipated future activities." However, either in this rulemaking or in subsequent guidance, DEQ should better define "reasonably anticipated future activities" to assist both cleanup agents and the public in better understanding the characteristics of these future activities.		
		MCC	The rules would redefine the "relevant pathway" of exposure by eliminating the standard of "reasonable potential for exposure" and adopting a reference to "potential future uses," which are undefined and unlimited in nature. If the application of this rule does not		

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			respect institutional controls which may limit future exposure pathways, persons implementing response activities would be either required to achieve the most conservative/protective levels possible, or to enact very restrictive covenants.		
		MOGA	*9-13-2016*: We are unclear why the existing language that requires reasonable and relevant exposure pathways has been amended to read "relevant … including potential future uses". No guidance is given as what may constitute a potential future use. This creates unnecessary confusion and potential places undue burden on those in our industry conducting Part 201 activities. The change in the 1st sentence should be deleted, the original language of "reasonable and relevant exposure pathways" and eliminate the broad language of "potential future uses". At a minimum, there must be clear, objective standards or guidelines on what constitutes "reasonable potential to be exposed". *10-18-2016 Additional comments*: We note the change to include "Reasonable Potential to occur at a facility including current and reasonably anticipated future activities" However, we feel no guidance is given in the proposed part 201 rules as to what may constitute a "reasonably anticipated future activity" nor is there a defined time frame given in which a "reasonably anticipated future activity" may occur.		
		CHAMBER	The draft rules add language to the definition that has created much confusion and concern. Specifically, the draft rules add the concept of "potential future uses" and create a presumption that certain components will always be present at a site. The use of the phrase "potential future uses" is exceedingly broad. We understand the DEQ may not have intended for such a possible broad interpretation. Also, the new presumption regarding components places an increased burden of proof on the regulated community. The regulated community is willing to continue discussing possible solutions that are more narrowly focused on achieving the DEQ's goals.		

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		HALEY	Changing the definition of "relevant pathway" to include "potential future uses" opens the door for all sites in Michigan to be required to be evaluated as if a day care center were present if the DEQ believes that someday this would be a future, highest, and best use regardless of the intended future use or restrictive covenants. Proposed modification to proposed DEQ change: Do not include all potential future uses as part of the relevant pathway definition.		
		WEC	*9-13-2016*: The definition of a "relevant pathway" in the proposed rules has been revised from the "reasonable and relevant" exposure pathway that currently applies to one that "may potentially occur at a facility in the future." This proposed revision is extremely significant since the scope of remediation activities is increased to address not only current exposure pathways, but future exposure pathways based on unknown "potential" future uses. Importantly, no guidance is given as to what may constitute or limit a "potential" future use. The revised definition also assumes that the components of an exposure pathway are expected to be present to a level that there is a "reasonable potential" for both human and nonhuman receptor exposure. This inappropriately assumes that an exposure pathway exists regardless of a facility's specific use, zoned use or actual site usage. In other words, a regulated party must disprove, to the DEQ's satisfaction, the existence of an assumed pathway which may not ever become relevant. Finally, a potential conflict exists between R 299.2 and those statutory provisions that allow for the use of alternative institutional controls. Part 201 allows for the imposition of land or resource use restrictions including alternative institutional controls to reduce or restrict exposure to hazardous substances and to eliminate an exposure pathway. R299.2 seems to indicate the default relevancy of an exposure pathway despite the fact that Part 201 assumes that certain institutional or engineered controls can be used to eliminate or mitigate an exposure pathway. We are concerned that remediation activities		

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			and costs could be significantly impacted since subjective assumptions will likely need to be rebutted in order to eliminate an exposure pathway from consideration. We see no need to conduct unnecessary investigations of exposure pathways to demonstrate that no potential exists for hazardous substance exposure. Predictability in remediation goals and procedures is essential to managing utility remediation costs. For these reasons, the DEQ should, at a minimum, reevaluate the revision to the definition of "relevant pathway" and remove any reference to potential future uses. *10-17-2016 Additional comments*: The definition of "relevant pathway" pursuant to Rule 299.2 has been slightly revised under the latest proposal and, instead of including unqualified future uses, it now states that a relevant pathway is "an exposure pathway that has a reasonable potential to occur at a facility including current and reasonably anticipated future activities." The rule continues to include the sentence, "These components are expected to be present such that human or non-human receptors have a reasonable potential to be exposed to a hazardous substance from a source or release." This language continues to be of concern for several reasons. First, the definition creates an automatic assumption that hazardous substance "components are expected to be present …" Thus, under this proposed rule change, every pathway becomes, by default, a relevant pathway, even if that pathway can be practically demonstrated to be irrelevant or may otherwise become irrelevant as a result of a land or resource use restriction. Further, the new language still requires an assessment of "reasonably anticipated future activities". Our concern with this language continues to be that this standard is inherently subjective as to what may be a "reasonably anticipated future activity". Arguably, any activity could be considered reasonably anticipated and significant disputes are likely to arise over the definition of these words. This surplus language in the rules is unnecessary, since		

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			Part 201 already defines a relevant pathway pursuant to MCL 324.20120(a)(2),(3). These statutory provisions specifically direct the DEQ to use "only reasonable and relevant exposure pathways in determining the adequacy of (generic or site-specific) … criterion." This direction from the Legislature applies both to generic and site-specific response activities. Having an alternative definition in these proposed rules does nothing to add clarity and merely provides surplus language which will most certainly result in disputes. Finally, if an anticipated future use is residential (and it can be argued that almost every potential land use is residential), then only the residential criteria will ever apply to response activities in Michigan. At a minimum, it leaves the regulated party in a position of having to guess at whether or not their target land use criteria should be considered residential or non-residential. Many of the comments that we provided in our original submittal still apply. The definition of "relevant pathway" needs to be revised.		
2	(i)	PM	Definition of "risk assessment": A risk evaluation is an estimate of risk. A risk assessment is a series of calculation used to determine, mathematically, the theoretical risk associated with a hazardous substance released to the environment based upon various assumptions and input criteria. Therefore, do not replace the work "determined" with "estimate" rather replace it with "calculate".	Risk assessment as used in the development of generic criteria does not consist of a series of calculations with known inputs. Assumptions are made to address a population rather than site-specific risks. Therefore, the term estimate better reflects the accuracy of the level of risk generic criteria represent.	None
2	(k)	MMA	Definition of "volatile". See comments also for Rule 49(1)(OO).	The USEPA's definition of "volatile" is based on either the Henry's Law Constant or vapor pressure. USEPA designates 1,4-Dioxane as a volatile. This concern was discussed further as part of the Phase II Stakeholder Process. The DEQ will use the USEPA definition of volatile.	Rule 2(k) Rule 26(2) Rule 27(2) Rule 46 Tables 2-4 Rule 49 Footnote (OO)
		ARCADIS	*9-13-2016:* A definition for "volatile" has been added in the proposed text and is only based on the Henry's law constant. This approach is not consistent with USEPA's revised definition of volatile, which is based on both the Henry's law constant and vapor pressure. However, the DEQ does not consistently apply their definition of a volatile constituent. For example, 1,4-dioxane is treated as volatile, even though the Henry's law constant is below the threshold for volatile compounds.		

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			Arcadis recommends that the DEQ apply their definition of volatile consistently to all constituents. *10-18-2016:* The definition for "volatile" is only based on the Henry's law constant. However, the DEQ does not consistently apply their definition of a volatile constituent. For example, 1,4-dioxane is treated as volatile, even though the Henry's law constant is below the threshold for volatile compounds. Arcadis recommends that the DEQ apply their definition of what is a volatile constituent consistently rather than picking and choosing what constituent to identify as volatile.		
2	(m)	PM	The word Act should be capitalized as used.	Case is consistent with rule drafting protocol.	None
3	(1)	PM	The adjective "all" does not correctly modify the singular noun "activity". The first 3 words should read "A response activity" or "All response activities".	Response activity is a statutory defined term that is appropriately used as a plural.	None
3	(1)		Concern with the statement: "The absence of a chemical, substance, or water quality characteristic from the list of part 201 criteria means the department has not conducted an evaluation for that substance, it does not mean the department has determined the chemical is not a hazardous substance."	As part of the Phase II Stakeholder Process this statement was discussed and has been removed.	Rule 3(1)
3	(2)	MMA KUHN	The emphasis that response activities must address not just discrete hazardous substances, but also breakdown hazardous substances and mixtures and reaction products that have resulted from hazardous substances will require testing for more than only what was released at a facility. The change moves away from using target analysis to determine the suite of constituents necessary to evaluate the conditions at the site. Standard analytical scans may need to be modified to properly quantify these additional constituents. The DEQ will likely require that more hazardous substances be tested for at a facility. Tox data for many breakdown products is not available and the DEQ may impose additional requirements on parties to conduct research to demonstrate these breakdown products do not present a risk. The DEQ will be less inclined to approve natural attenuation without exhaustive demonstrations of the behavior of all	This provision does not provide the DEQ any additional authority. The provision provides clarification of the statutory provisions (definitions of facility, release, and disposal) that a person is liable not only for the hazard substance released but any constituents of the hazardous substance (e.g., a breakdown product or metabolite) and where hazardous substance have otherwise come to be located (e.g., resulting from a reaction or other physical or chemical change). There is no expectation that this provision will result in any program implementation changes. The DEQ's statutory authority has been used to identify additional contaminants that require	None

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			derivative constituents of the released hazardous substance. The proposed rule provides no limit as to what additional constituent parameters may be demanded by the DEQ. Limits should be placed on DEQ to demand efforts to find additional derivative compounds that are unlikely to exist or persist at a facility based on site conditions or the proposed rule provision should be eliminated.	development of cleanup criteria, generally from the typical analytical scans identifying the presence of a contaminant without criteria to assess the risk.	
		CONSUMERS	*9-13-2016*: This change moves away from using target analytes to determine the suite of constituents necessary to evaluate the conditions of the site. It is also possible that standard analytical scans may need to be modified to properly quantify these additional constituents. The MEQ will likely require that more hazardous substances be tested for at a facility based on not only what was released at a facility, but suspected derivatives of same and any hazardous substances that may result from a reaction or other physical or chemical change associated with the release. The DEQ may be less inclined to allow for or approve natural attenuation to remediate facilities without exhaustive demonstrations of the behavior of all derivative constituents of the released hazardous substance. This proposed rule provides no limit as to what additional constituent parameters may be demanded from DEQ. *10-18-2016:* Comment resubmitted		
		MCC	*9-13-2016:* The proposed rules place greater emphasis on response activities to address not just discrete hazardous substances but also the breakdown products of those hazardous substances, isomers of hazardous substances, and mixtures or reaction products that have resulted from hazardous substances. The MDEQ will likely require that more hazardous substances be tested for at a facility based on not only what was released at a facility, but suspected derivatives of same and any hazardous substances that may result from a reaction or other physical or chemical change associated with the release. The MDEQ will be less inclined to allow for or approve		

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			natural attenuation to remediate facilities without exhaustive demonstrations of the behavior of all derivative constituents of the released hazardous substance. *10-18-2016*: The updated proposal retains a rule regarding hazardous substances that are the result of breakdown of other substances. This new rule does not provide any guidelines or limit to DEQ's discretion regarding potential derivative compounds, which are more likely to be less-studied and short-lived in nature.		
		WEC	The proposed amendments to R299.3(2) require remedial investigation and response activity for not only the hazardous substances that have been released at a facility, but those hazardous substances which may result from reactive, physical, or chemical changes associated with a release. This proposed rule provides neither a limit as to what additional constituent parameters may be required by DEQ nor a limitation on the timeframe in which these additional parameters must be examined. Part 201 specifically provides for remediation approaches which rely upon documented natural attenuation processes. However, the impact of this proposed rule change creates substantial uncertainty since it appears to create new agency discretion in determining the scope, duration or extent of additional investigation necessary to satisfy the adequacy of proposed remediation. Practically, the changes will likely mean that the DEQ will be less inclined to allow for or approve remediation proposals based upon natural attenuation without exhausting demonstrations that every possible derivative compound has been examined. This will mean less predictability for the regulated community in planning natural attenuation remedies, and unnecessary costs for the investigation and remediation of facilities. For these reasons, WEC Energy Group requests that, if discretionary boundaries cannot be established for DEQ in implementing this rule, the rule change be abandoned.		
3	(6)	PM	Remedial actions are not defined in the Act or the proposed rules. Therefore, "All remedial actions that	"Remedial action" is defined in the act at MCL 324.20101(1)(qq). MCL 324.20118(4) and (5)	None

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			address" should be replaced with "A response activity that addresses" or "All response activities that address".	reference Rule 3(6) and uses the term "remedial action" and not the term "response activity."	
4	overall	MMA	The Part 201 program has operated on the premise that generic criteria may be used for all facilities under all conditions. If a party using generic criteria must always justify that the use generic criteria and its input factors are consistent with DEQ expectations all cleanups become site-specific cleanups.	While specific rule provisions were not provided for this comment, the concern appears to be addressed with the rule provisions that were removed 9-29-2016 [Rule 4(5), (6) & (7)].	No further rule revision required.
		WEC	The proposed rules largely abandon the current generic cleanup process and, instead, put significant emphasis on determining if site-specific conditions at a facility are consistent with DEQ risk assessment expectations. This rule change contradicts the statutory language of Part 201. The statutory language makes it clear that generic criteria are an objective benchmark for all hazardous substances and all uses. Under the proposed rules, considerable burdens are placed on the regulated community to evaluate whether generic cleanup criteria are protective at a facility based upon facility-specific conditions. The rule revisions suggest that if the DEQ subjectively deems the generic criteria as not protective, the DEQ may establish additional requirements for response activities to address the site-specific conditions. **Overall**, these proposed changes place additional burden on the regulated community to demonstrate to the DEQ's subjective satisfaction that the DEQ's assumptions in creating the generic criteria are supported or not supported by the specific facility conditions. This presumption rests in stark contrast to statutory provisions of Part 201 which assume that the objective generic criteria established pursuant to MCL 234.20120(a) are safe for all exposures at all facilities. The regulated community has an additional disadvantage under the proposed rules, given the fact that the DEQ proposes to not provide the basis for calculating the generic criteria. This, coupled with more stringent standards for sensitive populations that are not representative of the exposure community, means unnecessarily stringent cleanup criteria will be applied to nonobjective administrative		

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			processes. The proposed amendments to Rule 299.4 appear to abandon the use of generic criteria and instead authorize DEQ to subjectively develop site-specific criteria at any facility without any scientific analysis. For these reasons, R299.4 should be reexamined and rewritten in light of the already delineated Part 201 strategic goals.		
4	(3)	PM	The updated text raises the question "what poses as acute or short-term toxicity"? The following should be added: A hazardous substance may only be considered to cause acute, or short-term, toxicity to humans, if a weight of evidence approach is used and corroborated with multiple independent scientific studies, ideally 3 or more.	This subrule was modified in response to this comment to revise "poses acute or short-term toxicity" to "has the potential to cause an adverse human health effect for short term exposures". When applied, the toxicity source will define the short term toxicity and exposure time-frame.	Rule 4(3)
4	(5)	MMA	This provision allows the DEQ to develop site-specific criteria at a facility with almost no objective basis and without any other scientific analysis or input. This provision should be deleted; it is beyond the intent of the legislature (Section 14).	On 9-29-2016 this proposed subrule was deleted in response to these comments. The DEQ will evaluate the need for this provision with future revisions of these rules.	No further rule revision is required.
		CONSUMERS	This is very open ended and greatly minimizes the risk assessment ability that is supposed to exist under Part 201. This is more appropriately addressed through Due Care requirements if deemed necessary to maintain. The provision should be deleted.		
4	(6)	MMA KUHN	The places onus on those implementing response activities which could include a new potential property owner conducting a Phase I property assessment prior to purchase, to evaluate whether generic criteria are protective at a facility based on facility-specific conditions. This provision should be deleted it is beyond the intent of the legislature (Section 14).	On 9-29-2016 this proposed subrule was deleted in response to these comments. The DEQ will evaluate the need for this provision with future revisions of these rules.	No further rule revision is required.
		CONSUMERS	It is extremely hard to determine if a condition would make the generic criterion not protective, when we do not have all of the bases for the generic criterion and they are not consolidated in easily identifiable manner within the rules package.		
		MCC	Any prospective purchaser of a property would likely be responsible – through a BEA- for evaluating whether the property would in some way exceed generic criteria based on the DEQ application of more stringent site-specific criteria.		

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4	(7)	MMA KUHN	This places a burden & additional uncertainty on those conducting response activities to confirm that the expected activity patterns at a facility are consistent with the exposure assumptions used by the DEQ to calculate the applicable generic criteria. Parties would need to research & understand how the DEQ developed its assumptions. This provision should be deleted it is beyond the intent of the legislature (Section 14).	On 9-29-2016 this proposed subrule was deleted in response to these comments. The DEQ will evaluate the need for this provision with future revisions of these rules.	No further rule revision is required.
		BARR	This is unclear. Is the DEQ asking for confirmation that the site is residential or nonresidential? If the DEQ asking if the site meets all of the generic assumptions, those should be listed in a concise manner or their location referenced		
		CONSUMERS	Identifying and planning for all expected activity at the site is neither practical nor necessary as these are due care issues and should be addressed as such. For example, the volatilization to indoor air pathway assumes a house without basement for soil screening levels (Tier 1 and 2) and a house with a person living in a basement for the groundwater and vapor screening levels (Tier 1 and 2). Will all volatilization to indoor air pathway assessment need to proceed to Tier 3a or 3b, where a consistent building type can be selected in order to confirm that the expected activities patterns at a facility are consistent with the exposure assumptions used by the DEQ to calculate the applicable generic cleanup criteria? As previously indicated, this is also a complicated task to perform with all of the assumptions used by the DEQ are not known or readily available in the rules package (versus a technical supporting document)..		
		WEC	In addition, an affirmative burden is placed on the regulated party to confirm that the “expected activity patterns” at the facility are consistent with the exposure assumptions used by the DEQ to calculate applicable generic cleanup criteria, even though the DEQ proposes to have no obligation to provide the information DEQ used to establish those criteria. (See proposed changes to R299.6 (19) and R299.40.)		

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4	(5), (6), & (7)	CHAMBER	The draft rules contain language originating from language previously contained in rules related to remedial actions and RAPs that were rescinded by the DEQ and the legislature in 2012. Specifically, the language concerns the ability of the DEQ to require actions that go beyond meeting generic criteria and the obligations of a person to make a reasonable inquiry into the conditions and expected activity patterns at a property in relation to the conditions and assumptions used to develop generic criteria. The legislature has already rescinded this language in relation to remedial actions and RAPs. In addition, the draft rules greatly expand the language that was previously contained in the rescinded RAP rules. It would apply not just to remedial actions but to all response actions, which would include every evaluation of a property. This would be a fundamental change to the Part 201 program and inconsistent with the intent of the legislature. With that said, we understand that the DEQ may not have meant for such far-reaching implications. The regulated community is willing to continue discussing the DEQ's concerns surrounding these issues and possible solutions to the concerns.	On 9-29-2016 these proposed subrules were deleted in response to these comments. The DEQ will evaluate the need for these provisions with future revisions of these rules.	No further rule revision is required.
4	(8)	MMA KUHN	Environmental data must "reliably represent conditions of the environmental media" for the application of cleanup criteria, but no guidance is provided as to what constitutes a "reliable" representation. This suggests that the MDEQ has the ability to require more rigorous investigation and analysis of impacted environmental media in a more conservative manner to assess the extent, concentration, and exposure pathways that may be involved so that the condition of the environmental media at issue may be "reliably represented."	This is now Rule 4(5). The determination of whether site data accurately and sufficiently represents conditions of the environmental media is a fundamental premise of the site investigation process. Reliably representative data is needed for interpretations of the importance of exposure pathways and the risks they represent. The use of the term "reliably representative" is consistent with the 2005 ATSDR Public Health Assessment Guidance Manual and implementation of USEPA RSLs. There is no expectation that this provision will result in any program implementation changes.	None
		WEC	Finally, the rules mandate that environmental data shall "reliably represent conditions of the environmental media" for the application of cleanup criteria, but no guidance is provided as to what constitutes a "reliable" representation. This suggests that the DEQ has the discretion to require unnecessarily rigorous investigations		

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			and analysis of impacted environmental media to determine the extent, concentration, and exposure pathways that may be involved so that the condition of the environmental media at issue may be "reliably represented" to the satisfaction of the DEQ.		
4	(9)(a)	PM	Csat is the theoretical concentration of a hazardous substance in soil at which the solubility limits of the soil have been reached, i.e., the soil is saturated with the hazardous substance which by definition is mobile NAPL. All instances of "NAPL" should be replaced with "migrating NAPL and/or mobile NAPL".	See the response to comments for Rule 1(j).	None
4	(10)	PM	It is impossible to protect against all acute hazards; the last 2 words (acute hazard) should be replaced "acute flammability or explosivity hazard".	This proposed subrule is now proposed Rule 4(7). The subrule was modified in response to this comment.	Rule 4(7)
4	(11)	MMA	In at least four rules, the DEQ adopts the use of TEFs: rules 299.34(1)(a) and 299.49(1)(O) for dioxin and "dioxin-like" compounds, including PCBs; rule 299.34(1)(b) for carcinogenic polynuclear aromatic hydrocarbons; and rule 299.4(11) for any other "isomers of hazardous substances" that DEQ identifies.	This proposed subrule is now Rule 4(8) The existing Rule 49 Footnote (J) has identified hazardous substances that may be present in several isomer forms and required isomer-specific concentrations to be added together for comparison to criteria. This practice is consistent with USEPA RSLs and other states for these substances. In general, the DEQ requires combining isomers for comparison to criteria where analytical limitations preclude identification and quantification of the individual isomers (for example, 2-methylphenol and 3-methylphenol) and the isomers are known to produce the same or similar adverse health effects. Rule 4(11), for transparency, provides rule language beyond just the criteria table footnotes for this requirement. See response to comments for Rule 34(1)(a) regarding the use of TEFs. The use of TEFs is consistent with USEPA RSLs and guidance. See response to comments for Rule 49(1)(O), regarding TEFs for dioxins. See response to comments for (1)(Q) regarding relative potency factors for cPAHs.	None
4	(12)	PM	This is too vague to understand how the characteristics will be footnoted. The following sentence should be	This proposed subrule is now Rule 4(9). The subrule purposefully identifies these conditions as being	None

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			added. The footnotes to be used in the criteria tables in R 299.46 for hazardous substance characteristics defined in Part 111 of the Act include (I) for ignitability, (R) for reactivity, (U) for corrosivity, and (KK) for toxicity with all footnotes defined in Rule 299.49.	footnoted in the criteria tables, to provide authority for the footnotes of Rule 49. The specific criteria table footnotes do not need further identification or duplication in these rule provisions.	
4		MMA	Proposed subrule (13) provided to address submissions under review.	This proposed subrule was not added. The DEQ has proposed an effective date 6 months after promulgation, and a grace period where an No Further Action Report or Closure Report submitted would be reviewed under the 2013 criteria unless there is a determination by the director that the response activity or corrective action conducted in reliance of the 2013 criteria would result in an unacceptable risk. The grace period will cover the time period 6 months prior to rule promulgation to 6 months after rule promulgation.	None
6	Overall	MMA KUHN	Currently, generic criteria are based upon two formulas, one for carcinogenic effects and one for non-carcinogenic effects from exposure. This approach is consistent with USEPA and our neighboring states. The DEQ has developed a number of additional novel equations to determine exposure levels. Those equations take into consideration a number of additional factors including more sensitive potential receptors, site-specific parameters, and additional exposure assumptions. This yields a wide range of criteria that must be determined by appropriately credentialed professionals. Since the rules require that the criteria be at least the minimum of the values calculated for the various scenarios, the DEQ seemingly has the discretion to require that more restrictive criteria be used based on assumed site-specific conditions. Under the new proposed rules, the MDEQ not only does not have a minimum value for the cleanup criteria, but it has also left open the possibility that more stringent criteria may be imposed without any guidance as to why or how those criteria may be imposed. • The process of determining criteria alone will be much more intensive and require much more data, and will	The DEQ has developed additional equations in response to recommendations from the CSA to address mutagenic carcinogens [recommendation 2.4 & 2.5] and non-cancer developmental or reproductive effects [recommendation 2.1]. The generic criteria are based on the most restrictive of the results of the equations, compared to the other relevant provisions of Rule 6. The DEQ has developed proposed generic criteria consistent with the proposed rule equations and has provided generic criteria based on the most sensitive effect consistent with MCL 324.20120a(4). The basis of each criterion is provided in the criteria tables. No provisions of these rules affect to application of the generic cleanup criteria provided for in Part 201 or Part 213. Consistent with MCL 324.20120a(1) the use of generic cleanup criteria is the option of the person proposing the remedial action. As an alternative, the person proposing the remedial action may develop site-specific criteria that satisfy	None

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			result in additional areas of disagreement between the MDEQ and those performing response activities. • The proposed rules do not offer clear guidance as to what criteria may be appropriate or how much latitude the DEQ has in requiring that more restrictive criteria be applied to a facility. • Generic cleanup criteria will be effectively eliminated if site-specific criteria must be used. • Those conducting response activities will have to engage in a robust risk assessment calculation in situations where site conditions do not justify this type of extraordinary effort. A strong likelihood exists that MDEQ will take the position that facilities that have been managed by administrative orders or consent decrees or closed under non-NFA conditions under the current rules may be subject to re-examination or reopening under the proposed rules. This would mean that sites may effectively never be closed and subject to ongoing remediation.	the requirements of MCL 324.20120b and other applicable requirements of Part 201. The commenter's recommended action is stated as "Proposed Rules 299.4(4), (5) and (7) should be abandoned." These subrules do not appear to address Rule 6, but rather Rule 4. On 9-29-2016 proposed Rule 4(5), (6) and (7) were deleted in response to other comments.	
6	header	PM	Addition of the phrase "known as" is too anthropomorphic. The text should be updated to: The Part 201 generic cleanup criteria are "defined as the risk based screening levels for Part 213".	The Rule 6 header was modified as a result of this comment.	Rule 6 Header
6	Overall	MMA	Identification as criteria values adopted by other programs/processes.	Standards from other programs or processes that become Part 201 criteria are established as statutory provisions, and outside the scope of these rules. This comment was discussed as part of the Phase II Stakeholder Process. The DEQ will remove the GSI criteria from the groundwater criteria table and the soil protection of GSI criteria from the soil criteria tables. Updates to these criteria will be governed by statutory provisions. The DEQ intends to publish the GSI criteria for easy reference. The rule provisions related to updating the criteria have been removed.	Rule 6((15)-(16) Rule 49 Table 1-3
6	(1)	PM	This attempts to state that the generic cleanup criteria for various media are established and listed in the criteria tables. However, volatilization to indoor air is a pathway	The subrule was modified in response to this comment to address both cleanup criteria and screening levels.	Rule 6(1)

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			not a media. Revise sentence to: Generic cleanup criteria for soil, groundwater and vapor, for the residential and nonresidential categories are established pursuant to the subrules of this rule and are listed in the generic cleanup criteria tables in R 299.46.		
6	(2)	PM	This attempts to state that the generic values for the various media are derived from the equations defined later in the proposed rules. The term "cleanup values" is not defined and is inconsistent with the term cleanup criteria used throughout the rules. The media adjectives are also inappropriate. The 1st sentence should be read: Generic cleanup criteria for soil, groundwater and vapor, for the residential and nonresidential categories are derived from the equations in R 299.10, and R 299.20 to R 299.27.	On 9-29-2016 this proposed subrule was modified in response to this comment to revise cleanup values to health-based values.	No further rule revision is required.
6	(4)	PM	What if the calculated health based value derived from R 299.10 for a hazardous substance is less than the state drinking water standard? Define the state drinking water standard, how it is calculated, under what statute, and who maintains/updates the state drinking water standard?	The statute, MCL 324.20120a(5), designates the state drinking water standards (SDWS) as established pursuant to section 5 of the safe drinking water act, 1976 PA 399. Pursuant to MCL 324.20120a(5), if the health-based value calculated is less than the SDWS, the criteria becomes the more stringent of the SDWS, or the state or federal aesthetic standard.	None
6	(6)	PM	Define/list which footnote (S) is used for this exception	The proposed rule purposefully identifies the condition as being footnoted in the criteria tables without designating the specific footnote, similar to other rule provisions.	None
6	(8)(a)	PM	Define/list which footnote (M) is used for this exception	The proposed rule purposefully identifies the condition as being footnoted in the criteria tables without designating the specific footnote, similar to other rule provisions.	None.
6	(10); (16)	PM	"part 31 of the Act" should be spelled using Proper Noun capitalization as Part 31 of the act.	Case is consistent with rule drafting protocol.	None
6	(14)	PM	This is too vague and provides the DEQ too much authority to develop criteria without following the legal and recommended framework for such actions. The following should be added: For a substance that is listed in the cleanup criteria tables in R 299.46, if the DEQ obtains sufficient information to support calculation of a	This existing subrule provision has been removed.	Rule 6(14)

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			cleanup criterion which is designated in the cleanup criteria tables of R 299.46 with a footnote "NA", then the DEQ shall use best available information and weight of evidence to calculate a cleanup criterion for the hazardous substance using the equations in R 299.10, and R 299.20 to R 299.27. The DEQ shall develop the new criterion and promulgated during the next revision of the Part 201 Rules.		
6	(14) - (19)	CONSUMERS	The proposed rules attempt to avoid the rule making process for developing and making changes to certain criteria. The proposed new rules allow the DEQ to automatically establish new criteria by placing information on its website when developing criteria for new hazardous substances, developing criteria for hazardous substances with an N/A designation, and incorporating changes in values from other programs (state drinking water standard and water quality standard for surface waters). As explained above, this contradicts the transparency concepts from the CSA process.	These subrule provisions have been removed.	Rule 6(14)-(19)
6	(15) – (18)	ARCADIS	*9-13-2016*: Some groundwater surface water (GSI) criteria will be updated based on changes, with updates being effective when they are announced. These changes would take effect without public comment. 1. Drinking Water Criteria that are based on the State Safe Drinking Water Act 2. GSI criteria, as Rule 57 values are updated 3. Soil protective of groundwater criteria when the groundwater criteria changed 4. Criteria that are based on target detection limits It is recommended that any revisions to the criteria should only take place following public comment. *10-18-2016:* Comment resubmitted	These subrule provisions have been removed.	Rule 6(15)-(18)
6	(18)	PM	Revisions to values used a generic cleanup criteria, i.e., target detection limits in this subrule, must be subject to stakeholder involvement and public review/comment process.	This subrule provision has been removed.	Rule 6(18)
6	(19)	MMA	The proposed rules attempt to avoid the rule making process for developing and making changes to certain	This provision was not new but renumbered. On 9-29-2016 Rule 6(19) was deleted as a result of	No further rule revision

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			criteria. The proposed new R 299.6(19) allows the MDEQ to automatically establish new criteria by placing information on its website when developing criteria for new hazardous substances, developing criteria for hazardous substances with an N/A designation, and incorporating changes in values from other programs (state drinking water standard and water quality standard for surface waters). As explained above, this contradicts the transparency concepts from the CSA process and removes the adoption of toxicity values and determinations without any public scrutiny. Recommended Action: R299.6(19) should be eliminated in its entirety.	these comments.	necessary
		PM	This allows the DEQ too much authority to make changes without following the legal and recommended framework for such actions. This subrule must include a minimum 90 day timeframe for peer review, public hearings and comment period. The DEQ must provide backup documentation to support proposed criteria changes made outside the APA.		
		CHAMBER	The draft rules propose to add an automatic update process for actions that have not been through the APA process. All changes to or new criteria must go through the APA process.		
6, 10, 20, 26, 27 and 38		WEC	Some of the most comprehensive changes in the proposed rules govern the calculation of residential and nonresidential generic criteria using health-based values depending on the effects of a particular hazardous substance. Currently, generic criteria are based upon two formulas, one for carcinogenic effects and one for non-carcinogenic effects from exposure. The DEQ, however, has developed a number of additional equations in the proposed rules that take into consideration a host of factors including more sensitive potential receptors, site-specific parameters, and additional exposure assumptions. Importantly, since the rules require that the criteria be at least the minimum of the values calculated for the various scenarios, the DEQ has the discretion to require that more	It appears from these comments that many of these concerns were addressed by the deletion of proposed Rule 4(5), (6), and (7) on 9/29/2016. The DEQ has developed additional equations in response to recommendations from the CSA to address mutagenic carcinogens [recommendation 2.4 & 2.5] and non-cancer developmental or reproductive effects [recommendation 2.1]. Consistent with the current rules, the generic criteria are based on the most restrictive of the results of the equations, compared to the other relevant provisions of Rule 6. The DEQ has developed the proposed generic	No further rule revision required.

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			restrictive criteria be used based on site-specific conditions. In other words, the DEQ has established a minimum value for the criteria based upon exposure assumptions which may not be relevant. In addition, the proposed rule contains no guidance as to why or how those criteria may be imposed. The practical impact of these proposed rule changes is even more critical due to the fact that the proposed rule also disfavors generic criteria and instead relies on application of site-specific criteria. The combination of these rule changes creates an undefined process and an unpredictable outcome. Clearly, the exposure assumptions the DEQ has proposed will yield very different results based on the sensitivity of the receptor population. It is not known whether the assumptions incorporated into each equation are relevant or appropriate, or how the process works in terms of determining what equations to use for a particular site. What is clear is that the equations have a profound impact on both generic and site-specific cleanup criteria. Under the proposed rule revisions, the process of determining criteria will be much more intensive, require the use of questionable data sources, and by nature expand staff discretion without any program structure to guide predictability or consistency. Specifically, the proposed rules do not offer clear guidance as to how DEQ staff will evaluate facility uses and conditions or how much latitude the DEQ has in requiring that more restrictive criteria be applied to a facility. Without clear guidance, cleanups will be more costly, time consuming, and result in greater unpredictability. Finally, a significant concern is that facilities that have been closed under the current rules may be subject to re-examination or reopening under the proposed rules. This would mean that sites would effectively never be closed and subject to ongoing regulatory scrutiny. The proposed rules thus would impede the progress of cleanup and create substantial uncertainty for the regulated community. For these reasons, it is requested that the DEQ critically reexamine these provisions and leave the	criteria consistent with the proposed rule equations and has provided generic criteria based on the most sensitive effect consistent with MCL 324.20120a(4). The basis of each criterion is provided in the criteria tables. No provisions of these rules affect to application of the generic cleanup criteria provided for in Part 201 or Part 213. Consistent with MCL 324.20120a(1) the use of generic cleanup criteria is the option of the person proposing the remedial action. As an alternative, the person proposing the remedial action may develop site-specific criteria that satisfy the requirements of MCL 324.20120b and other applicable requirements of Part 201. The liability protection provided by an approved NFA Report or Closure Report is governed by the statutory provisions of section 20126(4)(e) and section 21323a(4)(d) of the act, and not these rules. The application of the provisions that provide what a person may be liable for is not changed by the proposed rules.	

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			current use of generic criteria in place. Additionally, the proposed rules should be amended to specify that current "closed" facilities will not be reopened and that approved Remedial Action Plans or Response Activity Plans will not be disrupted by new administrative or criteria standards		
7	Overall	MMA	Use of USDA soil classification system	See response to comments for Rule 7(1).	None
7	Overall	MMA	Soil temperature inputs	Comment received. No additional information was provided to allow for a response.	None
7	Overall	MMA	Include fraction of organic carbon in soil properties for use in criteria calculations	Unlike the values provide in Rule 7(7), Table 2, the fraction of organic carbon (foc) is soil specific and not soil-type specific. The use of a single foc value and the foc value used is consistent with USEPA and other Region 5 states for the vapor intrusion pathway.	None
7	(1)	BARR	*9-13-2016*: The DEQ published list of Target Detection Limits and Designated Analytical Methods contains methods for the USCS, the rule provision relies on the USDA soil classification system. Will both need to be used at all sites? *10-18-2016:* Comment resubmitted.	The published list of TDLs is based upon the cleanup criteria of the existing promulgated rules. The DEQ expects upon promulgation of the proposed rules the published list of TDLs will be reviewed and revised to rely on the USDA soil classification system, where appropriate. .	None
		CONSUMERS	*9-13-2016*: The generic soil type input values used to develop Csat, soil-water partitioning, soil volatilization to ambient air, and volatilization to indoor air are based on the soil-type sand as classified by the Natural Resources Conservation Services of the USDA. This creates an inconsistency with Rule 46 Tables 2 & 3 that list background soil concentrations that are not based on the USDA classification. A consistent soil classification should be determined and used in all aspects of criteria development and site assessments. It is extremely inefficient to describe the soil at a location with 2 different methods. *10-18-2016*: Comment resubmitted	The statewide default background levels listed in the criteria tables are not soil-type specific. The default soil background values listed are a generic value applicable for all soil types. The additional tables within the Michigan Soil Survey, that are referenced in the statutory definition of background [MCL 324.20101(1)(e)], are more soil-type specific. These tables are labeled "topsoil", "sand", and "clay" for the soil survey. These are referenced in the soil survey as "general soil types", "visual observations and occasionally a soil classification system that divided into the general soil types". The background definition allows use of the values in these tables, if listed "and is present in a soil type identified in 1 or more of these tables". If a person were to use the clay tables to demonstrate that a hazardous substance is not present at a level that exceeds background concentrations, in accordance with the	

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				statutory provisions, there would need to be a determination that the clay soils are present at the facility. Since the clay soils soil survey values were classified with "visual observation and occasionally with a soil classification system" the determination of the presence of clay soils for a background determination is not inconsistent with the soil classification methods for facility-specific inputs to develop generic criteria.	
		GES	Other than the duration of time the data was collected, does the DEQ have any other reasoning why soil classification will now need to be completed according to USDA naming conventions? Other than utilizing the default of sand, for the most conservative geologic medium, will any provision be made for sites which are past the investigation stage, to allow conversion from USCS to USDA naming conventions? It would be a bit over the top to have to go back out after 10 or 20 years of data collection just to collect additional samples for sieve analysis.	The USDA classification is appropriate for determining the soil characteristics necessary to calculate generic criteria, and is consistent with the USEPA's User's Guide for Evaluating Subsurface Vapor Intrusion Into Buildings (2004). The USDA classification system allows for uniform and reproducible soil classification. The USDA soil classification system can be applied at any depth.	
		PM	USDA soil types and characteristics are inappropriate for use in determining generic subsurface soil characteristics as they apply to contaminant transport and exposure. The USDA soil survey is, in general based upon observations and extrapolation from the top 3 feet of shallow soil horizons in areas mapped. The major process for changes in soil composition and grain size distribution is aeolian (wind), resulting in a decrease in clay sized soil particles in surface and shallow soils. This is the primary reason the USDA soil survey shows less than ½ % of soils in Michigan to be clay. The soils deeper than 3 feet are not affected by the aeolian process. Soil units defined by USGS and classified using the USCS are more appropriate for determining soil characteristics to calculate generic criteria and screening levels.	There is not a requirement to adjust generic criteria with facility-specific soil-type inputs. Concentrations identified from past investigations that continue to satisfy generic criteria would require no further soil classification. If concentrations do not satisfy generic criteria and a person chooses to adjust the generic criteria with facility-specific soil types additional classification may be necessary.	
		GES	When coming up with the state-wide substrate default of sand, was any consideration given to the density of LUST sites. Granted a majority of the state might have a sand substrate, but the vast majority of gasoline stations are		

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			located within highly populated urban areas, which in SE Michigan are comprised of lacustrine silts and clays. Would it be possible for different districts to determine their own default soil types, based on the substrates normally encountered according to the density of their sites in their region rather than just defaulting to sand? GES thinks it would be a shame if we have to consistently go Tier II and Tier III on Detroit, Flint, Saginaw, etc. sites because the less populated rest of the state primarily consists of sand.		
7	(3)(i)	CONSUMERS	*9-13-2016*: The USDA system is textural classification system, not a visual classification system. What is the scientific basis for Table 1? Why is the DEQ opposed to the use of the clay, sandy, clay, sandy clay loam, clay loam, silty clay, silty clay loam, silt loam and silt that is properly classified using the USDA texture system? *10-18-2016*: Comment resubmitted	Rule 7 limited the soil types that could be "visually observed" based on CSA recommendations 3.1 and 3.2. Based on the review from these comments the phrase "visually observed" has been revised to classification of the four most common USDA soil types (sand, loam, loamy sand and sandy loam) with documented field methods. Field methods include, but are not limited by incorporating by reference within the rules, the USDA Soil Texturing Field Flow Chart. Classifications for the remainder of the USDA soil-type may be made with other DEQ approved methods. These methods may include additional field methods (e.g., sieve testing) and laboratory analysis, but are not intended to be limited by incorporating by reference specific methods within the rules.	Rule 7(3).
		BARR	*9-13-2016*: The USDA system is textural classification system, not a visual classification system. *10-18-2016*: Comment resubmitted		
7	(3)(i)	PM	Limiting the soil types that may be used to develop facility specific generic criteria to four types of sand and/or sand/loam mixtures is not reasonable and relevant for most facilities. The 1982 Michigan soil survey, Quaternary Geology of Michigan, mapped all unconsolidated soils between ground surface and bedrock, not just the top one to three feet. The 1982 soil survey documents the presence of all USDA soil types at greater than 2 percent with the exception of Sandy Clay. The majority of sandy soils (33% of state) exist in less populated area of the southwest lower peninsula, north central peninsula, and the central upper peninsula. Table 1 should be eliminated from the administrative rules package and property	The comment appears to be based on a misreading of the rule. All soil types are allowed to be used with the appropriate supporting documentation. The CSA determined the ability to visually classify with consistent and reproducible results should be limited to the four soil types identified in the rule. "Visual observation" has been revised based on comments received.	Rule 7(3)

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			owners should be able to use any soil types that are documented at a property location. Documentation may include USDA web soil interface, 1982 Quaternary Geology of Michigan map, and/or a facility specific ESA that includes visual and/or laboratory documentation of soil type.		
7	(3)(ii)	CONSUMERS	*9-13-2016*: If the DEQ is allowing the Environmental Professional (EP) to classify soil as sand, sandy loam, loamy sand, and loam; then the EP should be able to follow the entire USDA classification system and classify the remainder of the soil on the site without laboratory testing. *10-18-2016*: Comment resubmitted	The CSA determined the ability to classify with consistent and reproducible results should be limited to the four soil types identified in the rule. The rule was modified 9-29-2016 to allow confirmation of the remaining soil-types with methods that were not limited to laboratory analysis. This subrule was further revised to provide clarification based on comments received.	Rule 7(3)
		BARR	*9-13-2016*: The DEQ should allow for both the approved laboratory methods and alternative approaches approved by the DEQ. If the DEQ is allowing the professional judgment to classify soil as sand, sandy loam, loamy sand, and loam then professional judgment should be allowed for the entire USDA classification system without laboratory testing. A copy of the USDA classification system is attached. *10-18-2016*: If the DEQ is allowing the professional judgment to classify soil as sand, sandy loam, loamy sand, and loam then professional judgment should be allowed for the entire USDA classification system without laboratory testing. A copy of the USDA classification system is attached.		
7	(3)(iii)	BARR	*9-13-2016*: The selection of the soil type should be based on professional judgment, which may include the following: 1. Geologic sequence that is closest to the receptor is more representative of the potential exposure and the soil type may differ depending on pathway (VIAP vs PSIC) 2. Thickness of geological sequence (on a site with 4 feet of loam overlain by 6 inches of sand and 2 inches of concrete, the loam should be the soil type) Comment: Sensitivity analysis should be defined. *10-18-2016*: Comments resubmitted with addition - The varying soil types will have differing effects on the criteria	The use of facility-specific inputs to generate generic criteria, rather than site-specific criteria that require DEQ approval, is only appropriate if the approach and inputs are prescriptive and the results predictable. To represent generic criteria, the approach and professional judgment cannot result in different values for the same site condition. When a person believes that the most restrictive soil type does not accurately represent site conditions, a site-specific evaluation may be	Rule 7(3)

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			and the sensitivity analysis could show that sand is the most restrictive for VIAP and loam the most restrictive for PSIC. Which type should be selected? The DEQ needs to provide more clarity on this issue.	appropriate. This subdivision was modified to address the comment regarding sensitivity analysis.	
		CONSUMERS	*9-13-2016*: The DEQ has already provided the most restrictive criterion because sand has been used for the development of generic criterion. The selection of the soil type should be based on the following: 1. Geologic sequence that is closest to the receptor is more representative of the potential exposure and the soil type may differ depending on pathway (Vapor vs VSIC) 2. Thickness of geological sequence (on a site with 4 feet of loam overlain by 6 inches of sand and 2 inches of concrete, the loam should be the soil type) *10-18-2016*: *Additional comment* - The varying soil types will have differing effects on the criteria and the sensitivity analysis could show that sand is the most restrictive for VIAP and loam the most restrictive for PSIC. Which type should be selected? The DEQ needs to provide more clarity on this issue. Sensitivity analysis should be defined.		
7	(3)(iv)	BARR	*9-13-2016*: What is the rational to use sand to represent part 115 byproducts? Does "other non-native materials" refer to non-native to the site (imported sand) or does nonnative materials mean not a "soil type material" (brick, crushed concrete)? Can sand be assumed for these materials or is a site-specific evaluation necessary? *10-18-2016*: Comments resubmitted	Part 115 beneficial reuse by-products are a broad but defined range of industrial use by-product materials. The materials may have a wide range of soil input values. Sand as the most conservative soil-type was selected to represent the by-products. When a person believes sand does not accurately represent the by-product, a site-specific evaluation may be appropriate. Non-native material in this context means not a natural soil-type material. This subdivision was modified in response to these comments.	Rule 7(3)
7	(3)(iv)	CONSUMERS	*10-18-2016*: What is the rational to use sand to represent part 115 byproducts? Coal ash is a much finer material than sand. Does "other non-native materials" refer to non-native to the site (imported sand) or does nonnative mean not a "soil type material" (brick, crushed concrete)? Can sand be assumed for these materials or is a site-specific evaluation necessary?		
7	(3)(v)	BARR	*10-18-2016*: Are you trying to stated that for a given soil type all of the Table 2 parameters need to be used or are you stating that all the criteria need to be updated with soil type? Please add some clarity.	This subdivision was modified in response to these comments.	Rule 7(3)

<table>
<tr><th>RULE</th><th>SUB RULE</th><th>COMMENTER</th><th>COMMENT</th><th>RESPONSE</th><th>RULE REVISIONS</th></tr>
<tr><td>7</td><td>(3)(v)</td><td>CONSUMERS</td><td>10-18-2016: Is this stating that for a given soil type all of the Table 2 parameters need to be used or is it stating that all the criteria need to be updated with soil type? Please add some clarity.</td><td></td><td></td></tr>
<tr><td>7</td><td>(7)
Table 1</td><td>BARR
CONSUMERS</td><td>9-13-2016: What is the source of Table 1? What is the reasoning for disallowing the other USDA classifications if properly classified using the USDA texture system?
10-18-2016: Comment resubmitted</td><td>This table has been removed based on the revisions made elsewhere in response to comments on Rule 7.</td><td>Rule 7(7)</td></tr>
<tr><td>10</td><td>Overall</td><td>MMA</td><td>299.10 (groundwater by ingestion): add to the rule to clarify that the pathway is not relevant if there are no groundwater drinking wells in the area and wells are unlikely in the future because they are reliably restricted with a land or resource use restriction or the water is not potable.</td><td>See response to comments for Rule 2(h) -relevant pathway definition.</td><td>None</td></tr>
<tr><td>10</td><td>(3)</td><td>MMA</td><td>10-18-2016: R299.10(3), 46(6) Tables 1, 2, & 3,and 49(1)(E) are inconsistent with the Statute
Section 20120a(5) of the statute has long established Maximum Contaminant Levels (MCLs) pursuant to the Safe Drinking Water Act (SDWA) as the paramount health-based drinking water standard to be applied within the Part 201 program. The section provides that aesthetic impacts (formally established Secondary Maximum Contaminant Levels -SMCLs, or other appropriately derived values) if at a lower concentration may be identified as “generic” criteria. It does not allow health-based criteria derived pursuant to Part 201 to “over-ride” a SDWA MCL. However the proposed rules seek to impose Part 201 derived health-based values as criteria contrary to the clear provisions of the statute in at least the following places:
• Rule 299.10(3) is proposed to no longer reflect that the statute requires SDWA MCLs to supersede the rules derived process for developing health-based generic drinking water criteria
• Rule 299.46(6) Table 1 wrongly proposes Part 201 rules derived health-based Residential Drinking Water criteria for toluene and ethylbenzene even though Section 20120a(5) requires these criteria to be based on aesthetic values (the aesthetic values are lower than the SDWA</td><td>The existing rule provisions of Rule 6(5) and Rule 9 that addressed the situation where the health-based value was not overridden by an aesthetic taste or odor value that was higher than the health-based value were removed. The 9 substances where the health-based value is lower than the aesthetic value are revised back to the aesthetic value:
<table><tr><th>Hazardous Substance</th><th>Lowest Health-based Value (ppb)</th><th>Aesthetic Value (ppb)</th></tr><tr><td>Copper</td><td>30</td><td>1,000</td></tr><tr><td>Ethylbenzene</td><td>66</td><td>74</td></tr><tr><td>Fluorine</td><td>1,200</td><td>2,000</td></tr><tr><td>Silver</td><td>5.5</td><td>100</td></tr><tr><td>Toluene</td><td>470</td><td>790</td></tr><tr><td>1,2,3-Trimethylbenzene</td><td>60</td><td>130</td></tr><tr><td>1,2,4-Trimethylbenzene</td><td>60</td><td>63</td></tr><tr><td>1,3,5-Trimethybenzene</td><td>60</td><td>72</td></tr><tr><td>Zinc</td><td>1,800</td><td>5,000</td></tr></table></td><td>Rule 6(5),
Rule 9
Rule 46
Table 1
Rule 49
Footnote (E)</td></tr>
</table>

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			MCLs and the rules cannot be used to derive health-based values where an MCL exists) • Rule 299.49(1)(E) identifies as "applicable health-based drinking water values" Part 201-derived values which for several substances SDWA MCLs exist, thereby ignoring the legislative intent that SDWA MCLs, when available, are to be used as health-based values. These substances include ethylbenzene, toluene, and xylene. Section 20120a(5) states in part: "(5) If a cleanup criterion derived under subsection (4) for groundwater in an aquifer differs from either: (a) the state drinking water standards established pursuant to section 5 of the safe drinking water act, 1976 PA 399, MCL 325.1005, or (b) the national secondary drinking water regulations established pursuant to 42 USC 300g-1, or (c) if there is not national secondary drinking water regulation for a contaminant, the concentration determined by the DEQ according to methods approved by the USEPA below which taste, odor, appearance, or other aesthetic characteristics are not adversely affected, the cleanup criterion shall be the more stringent of (a), (b), or (c) … " However, the DEQ has proposed changes to the administrative rules that would seek to void the clear intent and requirement of Section 20120a(5) even though the law does not allow administrative rules to supercede the requirements of statute. Specifically, in the generic cleanup tables of Rule 46(6), in the footnote found in Rule 49(1)(E), and in revisions to Rule 10(3) (October 2016) the DEQ has proposed to use Part 201 health-based drinking water values developed by algorithms in the rules rather than by using the SDWA MCLs for health-based generic drinking water values. For those hazardous substances addressed under the SDWA, the generic criteria tables in Rules 46(1) and (2), and the footnote in Rule 49(1)(E) should be corrected to reflect the statutory requirement for health-based drinking water criteria to reflect SDWA MCLs rather than values derived per Part 201 rules. These substances, at a	The statutory provision [MCL 324.20120a(5)] allows when there is not a national secondary drinking water standard (SMCL) that the DEQ may determine according to methods approved by the USEPA the concentration below which taste, odor, appearance or other aesthetic characteristics are not adversely affected and that the criterion becomes the more stringent of (a) a SDWS, (b) a SMCL or (c) a DEQ derived aesthetic value. The aesthetic values for ethylbenzene, toluene, and xylene are a DEQ determination completed December 1991 by ABB Environmental Services, Inc., through use of USEPA Method 140.1. As these are the more stringent than the SDWS they are appropriately included as the generic drinking water criterion. The provisions of existing Rule 10(3) have not been deleted; the provision has been moved to Rule 6(4) and clearly states that the SDWS becomes the criterion pursuant to the statutory provisions. The statutory provisions provide that the cleanup criterion shall be the most stringent of SWDS or aesthetic value. See also response to comments for Rule 46(1) Table 1.	

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			minimum, include ethylbenzene, toluene, and xylene. Furthermore, the DEQ should reject the proposed deletion in Rule 10(3) that previously described the subjugation of the rules to the statutory requirements in Section 20120a(5).		
10	(6)	CONSUMERS	*9-13-2016*: Use of single event exposure (EF and AT) durations of 1 day (24 hrs.) AT of 1 day (24 hrs.) for a single event exposure is not reasonable. People do not stand in one spot for an entire 24 hrs. Do not calculate short term scenario (e.g. 1 day) criteria for chemicals where only chronic toxicity input factors are available. This comment applies to other rule equations. *10-18-2016*: Comment resubmitted	The weight of scientific evidence for prenatal exposure to many hazardous substances shows that a single exposure during a critical window of development can cause irreversible adverse outcomes for those offspring. Criteria based on a single event exposure durations are only calculated when the hazardous substance noncancer toxicity value is based on a prenatal exposure resulting in developmental adverse effect(s) that includes mortality, a structural abnormality and/or a functional abnormality. Multiple USEPA guidance documents and USEPA risk assessment practice for developmental toxicity and prenatal exposure is for a single event or acute exposure scenario, unless the adverse effect is only altered growth. The single event or acute exposure scenario use is consistent with recent (2015) USEPA guidance for TCE exposure related to vapor intrusion, and with USEPA risk assessments for exposures to TCE (2014) and n-methylpyrrolidone (2015) conducted under the Toxic Substance and Control Act. The DEQ has removed from Rule 49(1)(DD) the prohibition for statistical approaches to allow for further evaluation of individual exposure pathways and scenarios for hazardous substances with criteria based on developmental toxicity. This further evaluation will include spatial considerations with regard to the appropriateness of statistical approaches for these single event or acute exposure scenarios.	Rule 49(1) Footnote (DD)
20	Overall	MMA	299.20 (soil direct contact): change the rule to note that the direct contact pathway is not relevant if a suitable	See response to comments for Rule 2(h) -relevant pathway definition.	None

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			exposure barrier is in place and the barrier is reliably permanent in nature or construction, or is made permanent by a land or resource use restriction.		
20	Equations	MMA	Outdoor exposure frequency inputs and consistency with other exposure factors such as exposed skin surface areas The proposed exposure frequency for residential and nonresidential outdoor exposures is inappropriate and unreasonable when also considering the proposed value for exposed skin surface area. The DEQ has effectively proposed to assume that the typical population of residents and workers wear summer attire every day when the ground is not frozen (9 months) regardless of air temperature. Summer attire for residents is shorts, short sleeve shirts, no gloves or hat and no shoes for children. Summer attire for workers is short sleeve shirts and no gloves or hat. NOAA shows that the mean monthly temperature in MI cities is near or below freezing for 4 months of the year. A reasonable and realistic scenario would assume people would not wear summer attire when the air temperature is at or below freezing. The DEQ should at a minimum exclude from the dermal contact and incidental ingestion calculation the days when the outdoor air temperature is at or below freezing. The residential and nonresidential exposure frequencies should be selected from the TAG 2 Final Report. Appendix 10 – Appendix K of the CSA TAG 2 Report provided.	To allow the use of generic criteria to be protective for the majority of scenarios the generic criteria are developed using conservative assumptions and factors. The DEQ, in line with USEPA Risk Assessment Guidance, uses the RME as the highest exposure that is reasonably expected to occur at a site. The RME is a combination of high-end and central tendency values. Consistent with USEPA guidance, protecting public health with the RME approach addresses the exposure of all segments of the community, ensuring an adequate margin of safety for most of the potentially exposed. The residential receptor skin surface area is a weighted central tendency value that represents head, hands, forearms, lower legs, and feet for children and head, hands, forearms, and lower legs for residential adults. This is equivalent to a child wearing a short sleeved shirt and shorts and an adult wearing a short sleeved shirt, shorts, and footwear. It is a reasonable consideration that there could be times when these receptors could have more or less skin exposed for contact with soils, which is why central tendency estimates of skin exposure were selected. These generic assumptions are therefore considered appropriate and protective throughout the dermal exposure frequency period when soils are considered not to be frozen in Michigan. The nonresidential receptor skin surface area is a weighted central tendency value that represents the head, hands, and forearms, which is equivalent to a worker wearing a short sleeved shirt, pants, and footwear. It is a reasonable consideration that there could be times when workers could have	None

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				more or less skin exposed, which is why a central tendency rather than upper end estimates of skin exposure were selected. The DEQ's generic nonresidential skin exposure assumptions are consistent with USEPA's worker assumptions and are considered appropriate and protective for the dermal exposure frequency period when soils are considered not to be frozen in Michigan. The DEQ has reviewed the language of CSA recommendation 2.9 to 2.12 and Appendix K of the TAG-2 Report. The recommendations clearly imply further evaluation of all the exposure assumptions is expected and Table A plainly states and the appendix notes that it was not discussed by the TAG, and therefore is not a TAG recommendation. Nor were these assumptions vetted through the CSA recommended DQO process. An independent third party evaluated and selected the DEQ proposed generic exposure assumptions using the Data Quality Objectives and CSA recommendations.	
20	(3)	MMA	Generic oral absorption efficiency inputs.	This comment was further discussed as part of the Phase II Stakeholder process. The regulated community comments were that the values used are inconsistent with USEPA and there must be a transparent basis for selection of the values. The regulated community provided alternative values presented as USEPA recommended values. It is not accurate to identify the USEPA values as appropriate for the generic direct contact criteria as the cleanup criteria are not based on combined exposures (dermal, ingestion and inhalation) assumptions USEPA uses. The oral absorption efficiency inputs in the existing and proposed rules were developed in the early 1990s with the Act 307 Advisory Group for the Type C soil direct contact	None

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				equations and have been consistently used since then. Documentation specific to the development of the values has not been retained. In absence of data, the existing values were retained.	
20	(3)	MMA	The proposed generic dermal absorption efficiencies for VOCs and inorganics are not used by USEPA or any Region 5 states. The DEQ has provided no scientific or technical basis for the default values used. The DEQ is using assumptions from 1990 instead of most current best available science. For VOCs USEPA explains that they "would tend to be volatilized from the soil on skin and should be accounted for via inhalation routes in the combined exposure pathway analysis". There are Part 201 soil criteria for inhalation exposure to VOCs and it should not be included with dermal exposures. For inorganics USEPA explains that "the speciation of the compound is critical to dermal absorption and there are too little data to extrapolate a reasonable default value." The DEQ should follow the approach recommended by the CSA using Exhibt 3-4 of RAGS Part E. Proposed subrule provision provided.	This comment along with oral absorption efficiency was further discussed as part of the Phase II Stakeholder Process. Chemical-specific dermal absorption values presented in USEPA RAGS Part E document were adopted. In the absence of USEPA chemical-specific values, the existing generic input values were used. The dermal absorption efficiency inputs in the existing and proposed rules were developed in the early 1990s with the Act 307 Advisory Group for the Type C soil direct contact equations and have been consistently used since then. Documentation specific to the development of the values has not been retained. In absence of data, the existing values were retained.	None
		CHAMBER	The default AEd should follow USEPA's RAGS Part E. The corresponding default AEd values should be as follows: -VOCs = 0% -SVOCs = 10% -Inorganics = 0% The generic default dermal absorption efficiency (AEd) in USEPA's RAGS Part E, as used in the Regional Screening Levels by USEPA and in all Region 5 states to derive screening levels, are 10% for SVOCs, 0% for VOCs, and 0% for inorganics. USEPA used this approach when calculating generic screening levels in its Soil Screening Guidance, which also calculated separate criteria for the dermal/ingestion route and the inhalation route of exposure, as DEQ does in Part 201. Therefore (iii) has been revised to reflect this change and (iv) has been removed. This change is consistent with CSA Recommendation 1.1.	It is not accurate to identify the USEPA values as appropriate for the generic direct contact criteria as the cleanup criteria are not based on combined exposures (dermal, ingestion and inhalation) assumptions USEPA uses. As explained with the MDHHS comments, if defaulting to the USEPA is preferred there are multiple elements where the DEQ cleanup criteria need to align with USEPA risk assessment. One prominent difference is that USEPA uses combined exposure pathways (inhalation, dermal contact, and ingestion for soil) while the DEQ combines only ingestion and dermal exposure pathways. This is an example of a difference due to the DEQ use of only dermal and ingestion but not inhalation exposure pathways for soil. The USEPA does not have a default value for this parameter as people's exposure to VOCs should be addressed through the inhalation pathway for	

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				soil (not combined in the DEQ current or proposed direct contact cleanup criteria). MDHHS supports the use of the DEQ's values for volatile organic compounds as this is a health protective alternative if all of the relevant exposure pathways are not included in the cleanup criteria. For inorganics, the values determined in a previous stakeholder process and used for previous criteria calculations remain protective in the absence of chemical-specific information.	
20	(5) Equation 11-14	MMA	The DEQ again inexplicably ignored USEPA guidance, the practice of our neighboring states, and CSA Recommendation 2.12 in deriving its own unique exposure assumption for non-residential exposures, this time for the soil adherence factor (AF). The CSA Recommended value for the AF (or the mass of soil that sticks to a person's skin when contacting soil) referenced the USEPA's 2014 guide to Standard Default Exposure Factors, which utilized soil adherence data from a diverse group of outdoor workers in regular contact with soil. These studies included soil adherence data for groundskeepers, irrigation installers, farmers, gardeners, archaeologists, construction workers, landscapers, utility workers, and equipment operators. The current USEPA recommended soil adherence factor of 0.12 milligrams per square centimeter (or mg/cm2) is the appropriate and best available adherence factor for the outdoor worker scenario. This is also the value used by USEPA Region 5 and states neighboring Michigan where those states have updated their guidance subsequent to 2014. The DEQ, however claims it did not follow the USEPA and CSA recommendation for the AF because the USEPA guidance "did not describe the specific activities or data that were considered in calculating the recommended nonresidential default value (adherence factor) of 0.12 mg/cm2." Thus, it derived its own unique AF by going to the same source data USEPA used and hand-picked soil adherence data from the highest portion of the spectrum,	As explained with the MDHHS comments, if defaulting to the USEPA is preferred there are multiple elements where the DEQ cleanup criteria need to align with USEPA risk assessment. The USEPA RSLs separate out different worker exposure with an indoor, composite, outdoor, and two construction workers (one with standard vehicle traffic, and construction with other than standard vehicle traffic [e.g. grading, tilling, excavating, dozing, and wind]) scenarios. The USEPA's indoor worker soil screening level does not include dermal adherence of soil, but the outdoor and composite worker scenarios assume 0.12 milligrams per square centimeter (mg/cm2), and the two construction worker scenarios assume 0.3 mg/cm2 . Because the DEQ has only one worker scenario, they used an USEPA recommended value, found in the Risk Assessment Guidance for Superfund, Volume I, Part E, of 0.2 mg/cm^2. The DEQ proposed value was determined appropriate by an independent third party using the CSA recommended DQO process for exposure assumptions. As a RME, the value is protective of most exposure scenarios. This value is consistent with Indiana, Ohio, Massachusetts, Texas & California.	None

RULE	SUB RULE	COMMENTER	COMMENT	RESPONSE	RULE REVISIONS
			essentially various types of construction workers who work exclusively in the soil, and ignored adherence data for other typical outdoor workers without explanation. Because the outdoor worker is the generic non-residential receptor used for deriving Part 201 criteria, the DEQ's arbitrary selection of construction workers over a broader class of outdoor workers that could contact soil for this exposure parameter is questionable at best. While it may be possible that the DEQ could not replicate USEPA's value, our experts did not have much trouble and were able to both replicate the USEPA's calculation of 0.12 mg/cm2 and to determine that the types of exposures USEPA used to derive this default factor, such as construction workers, groundskeepers, irrigation installers, farmers, gardeners, archaeologists, and landscapers, were consistent with those representative of the DEQ's intent with the nonresidential land use scenario. We have shared our replication of the USEPA calculation with the DEQ. [Appendix 9] Recommended Action The nonresidential soil dermal adherence factor (AF) for outdoor workers should be USEPA's 2014 recommendation of 0.12 mg/cm2. This value is based on the best available and most current science that allows the Part 201 criteria to become consistent with CSA Recommendation 2.12, USEPA, and our neighboring states.	As provided with the response to the comments regarding the Rule 20 equations, the CSA recommendations clearly imply further evaluation of all the exposure assumptions is expected and Table A plainly states and the appendix notes that it was not discussed by the TAG, and therefore is not a TAG recommendation. Nor were these vetted through the CSA recommended DQO process.	
		CHAMBER	The nonresidential soil adherence factor for outdoor workers should follow USEPA's 2014 recommendation. The AF should be 0.12 mg/cm². The generic default soil adherence factor (AF) in the proposed rules is based on a subset of high end activities that DEQ derived for outdoor workers. However, USEPA's soil adherence factor considers a diverse group of outdoor worker activities that are reflective of all of the exposures considered in the outdoor worker exposure scenario. Therefore the AF for nonresidential dermal exposure to soil has been revised to 0.12 mg/cm² to reflect this change. This change is consistent with CSA Recommendation 2.12 and the value used by USEPA and		

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			other states in Region 5 to derive screening criteria.		
26 27	Overall	MMA	*9-13-2016*: Exposure Time factor for inhalation involving nonresidential exposures The generic criteria for protecting against the inhalation of vapors or particulates (VSIC, PSIC, VI) for non-residential exposures, as proposed by the DEQ in the rules, assumes Michigan employees work 24 hours per day for their 20 year working career. The DEQ's use of a 24-hour worker daily exposure (i.e., exposure time or ET) flies in the face of common sense, is a bad and unscientific assumption, violates Part 201, and ignores CSA Recommendation 2.12, which points to the technical report listing an 8 hours/day assumption for a work day. This would make the non-residential exposure time consistent with what USEPA and our neighboring states use for their non-residential exposure scenarios. The DEQ provided no justification for its 24-hour work day assumption, nor did it provide an explanation of how this assumption qualifies as "reasonable and realistic". Further, the DEQ apparently did not calibrate its selected exposure time by comparing it to those used by USEPA or states neighboring Michigan, which all base their selection on USEPA's most current guidance. People obviously do not work 24 hours per day for their entire careers. The DEQ's use of a 24-hour daily worker in the criteria is inconsistent with Section 20120a of the statute which requires DEQ generic criteria to "utilize only reasonable and relevant exposure pathways." It is not reasonable (realistic) for a person to work 24 hours per day for an extended period of time. Therefore, the resultant criteria calculated in the proposed rule are not relevant. This error is even more egregious when you consider the fact that the current Part 201 rules already include an adjustment factor that accounts for a work day being substantially less than 24 hours, but this factor was removed for these proposed rules. The DEQ's unilateral removal of such a relevant adjustment factor from the current rules and not replacing it with the current best available scientific approach is, at best, inconsistent with	The exposure time provisions are Rule 26(10) and Rule 27(17). USEPA RAGS (page 6-22) states: "If statistical data are available use the 95th percentile value for exposure time. In the absence of statistical data (which is usually the case), use reasonable conservative estimates of exposure time." Exposure time statistical data that are readily available from the Bureau of Labor Statistics indicates the **average** work day hours to be 8 hours. However, • Work-hours alone do not adequately represent the hours a person is exposed within the work space (e.g., lunch break); the minimum average time *exposed* would be 8.5-9 hours. • Average (50th percentile) hours do not adequately represent a 95th percentile or a reasonable conservative estimate of exposure time. Exposure time is considered by USEPA to be a high end, not an average exposure. A high end exposure is defined by USEPA as "that part of the exposure distribution that is above the 90th percentile, but below the 99.9th percentile". • 2016 BLS labor force statistics from the Current Population Survey indicate that 25 percent of persons in non-agricultural industries work 41 or more hours per week, 16 percent work 49 or more hours per week, and 6 percent work 60 or more hours per week. Persons in agriculture industries report even higher weekly work hours (Table 19, https://www.bls.gov/cps/cpsaat19.pdf). The	None

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			the statute, and could be interpret as disinterest in adhering to the recommendations of the CSA. Recommended Action: The current and best available science for a non-residential exposure time should be 8 hrs per day (i.e., RAGS Part F and 2014 Standard Default Exposure Factors), which is the time used by USEPA Region 5 and Michigan's neighboring states. The DEQ could implement this change in Rule 26 by multiplying the non-residential inhalation criteria from its calculator by 3 (or 24 hours a day / 8 hour a day exposure).The generic criteria for inhalation involving nonresidential exposures assume Michigan employees work 24 hours per day for their 20 year working career. The DEQ did not calibrate the exposure time with USEPA or neighboring states which all base their selection on USEPA's most current guidance. The current Part 201 rules already include an adjustment factor that accounts for a work day being less than 24 hours, but the factor was removed from the proposed rules. The current and best available science for a nonresidential exposure time should be 8 hours per day (i.e., RAGs Part F and 2014 Standard Default Exposure Factors). The DEQ could implement this change in Rule 26 by multiplying the nonresidential inhalation criteria from its calculator by 3. Proposed revisions to Rule 26 equations provided. *10-18-2016: Additional comments:* In the October proposed rules, Rules 26 and 27, which describes the requirements for calculating generic criteria for protection of nonresidential inhalation exposures to ambient vapors and particulates (VSIC, PSIC) and vapor intrusion via Tier 3, now include statements indicating a 24 hour per day exposure may not be required. Both Rule 26(10) & Rule 27(14) include the caveat "[c]ontinuous 24-hour per day exposure may not be representative of worker exposures in commercial or industrial settings" [emphasis added]. This statement pertains to the chronic (238 days/year for 20 years) exposure scenarios the DEQ has alleged to represent the reasonable maximum exposure (RME) for the typical worker population in the state. While the DEQ only just now recognizes that the 24 hour	non-agricultural survey data indicate that 94 percent of persons work 60 or fewer hours per week. Assuming a 5 day work week, this approximation of the 95th percentile equates to 12 hours per day as a reasonable upper end estimate of nonresidential exposure time. Again, these data are reported as "hours of work" and may underestimate the actual total hours an individual is at the work location when arrival/departure and meal break times are taken into consideration. In developing an inhalation acceptable air concentration, the generic nonresidential averaging times, exposure duration, and exposure frequency assumptions are proposed as reasonable and relevant: DEQ Proposed Rule Inputs: **NONRESIDENTIAL:** $$AAV_{ca} = \frac{TR \times AT_{ca}}{IURF \times ED_{nr} \times EF_{nr}}$$ Acceptable air value = chemical-specific Target risk level = 10^{-5} Averaging time = 28,470 days (78 years) Inhalation unit risk factor = chemical-specific Exposure duration = 20 years Exposure frequency = 238 days/year The only additional input for the calculation of nonresidential inhalation exposures is the exposure time. Due to the relationship of all the input factors, exposure time cannot be evaluated without assessing all the inputs together. Focusing only on the exposure time input in the DEQ proposed rule assumptions skews the reasonable maximum exposure value for the	

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<tr><th>RULE</th><th>SUB RULE</th><th>COMMENTER</th><th>COMMENT</th><th>RESPONSE</th><th>RULE REVISIONS</th></tr>
<tr><td></td><td></td><td></td><td>per day exposure “may not” be representative of a worker at a single workplace for 238 days/year and for 20 years, it has not convinced MMA that the DEQ has properly calibrated the criteria as the CSA recommended. In addition to the lack of a calibration to the exposure scenario inputs, the DEQ is also neglecting the statutory requirements to “foster the redevelopment and reuse of vacant manufacturing facilities and abandoned industrial sites” and “act[ing] reasonably in its exercise of professional judgment” as required by Section 20102 of the statute. Each of these would suggest that a 12 hour exposure time for a nonresidential worker is inappropriately long given these scenarios are genericized for a chronic exposure.
While the DEQ believes that working 24 hours/day for an entire working career is an exception that may not be appropriate, its proposal that assumes the typical worker population works 12 hours/day, 238 days/year, for 20 years, is similarly not calibrated or a reasonable exercise of professional judgement. One reason the DEQ has provided as to why a less intensive chronic workday was not considered is that they have chosen not to reopen their contract with the consulting firm who developed their criteria calculator. Thus, they claim to lack the ability to implement a change to the actual equation, but aim instead to make a gross change to the criteria proportional to the reduction in workday. During an October 12, 2016 MMA meeting, the DEQ stated that it could only use an assumed 12-hour (and not a different duration) exposure because “the calculation is non-linear.” Fortuitously, they claim, the resultant criteria can be multiplied by two (2) to represent a 12 hour workday, but other durations such as 8 hours (that USEPA and all other states use) are not transformed so easily.
Further, in its October 2016 proposed rule the DEQ does not change the generic cleanup tables in Rule 46, but instead presents the semi-transparent reduced exposure references in Rules 26 and 27 with the caveat that the increase in cleanup criteria “may” be appropriate and then leaves the interested party with the task of</td><td>inhalation risks. According to USEPA guidance, reasonable risk assessments address the exposure and risks to all segments of the community, not only the average individual. The reasonable maximum exposure represents an appropriate combination of high-end and central tendency values.

Since the surrounding states rely upon USEPA RSLs for volatilization to indoor air values, a comparison to those values was conducted as directed by statute [best practices of other states] and the CSA recommendation to properly calibrate the criteria. USEPA assumptions differ from the DEQ as follows:

<table><tr><td>ASSUMPTION</td><td>EPA</td><td>DEQ</td></tr><tr><td>Averaging time</td><td>70 years</td><td>78 years</td></tr><tr><td>Exposure duration</td><td>25 years</td><td>20 years</td></tr><tr><td>Exposure frequency</td><td>250 days/yr</td><td>238 days/yr</td></tr></table>
While USEPA has chosen to use 8 hours to represent the nonresidential exposure time, the overall assumptions that are inputs to USEPA’s equations represent high end exposures that can accommodate a central tendency estimate of exposure time and still result in a value that represents a reasonable maximum exposure to address all segments of the community. The resulting USEPA values, adjusted to the same risk levels, remain significantly more conservative than those of the DEQ proposed rules using 8 or 10 hours as an exposure time. Using a central tendency, average exposure time, within the DEQ proposed rules equation in combination with the inputs to the acceptable air concentration that are more central tendency assumptions results in a value that would address only the average individual. Generic criteria are intended to protect more than the “typical” average worker. Protection</td><td></td></tr>
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			multiplying each of the criteria by a factor of 2 in the hopes that it will be acceptable. There are several technical issues with the DEQ's proposed approach and rationale. The first and most significant concern with the DEQ's approach in its October 2016 proposed rules is that the DEQ erroneously believes the calculation of intake using exposure time (ET) is non-linear, which is alleged by the DEQ to limit the ability to calculate the criteria using another ET that may be more reasonable and relevant to the exposure scenario. This claim of nonlinearity of the intake is factually inaccurate. The fact that inhalation risk is directly proportional to ET (i.e., linear) can be seen in many places in the risk assessment literature, starting with the 2009 USEPA Risk Assessment Guidance for Superfund (RAGS) – Part F, which specifically addresses inhalation exposures. Equations showing this linear relationship also are presented in USEPA's Regional Screening Levels User's Guide. For example, if the DEQ were to choose not to modify the criteria calculator equation but select an 8 hour/day worker exposure, it would simply multiply the appropriate generic non-residential criteria in Rule 49 by 3 (i.e., 24hr / 8hr). The claim that the ET factor in the equation is non-linear is simply not true and MMA representatives have told the DEQ this each time they have made this assertion. Even though the DEQ has proposed to modify the rules so that implementing parties "may" assume workers do not work 24 hours/day, a 12 hour day is not the best science and does not represent a properly calibrated input factor for a chronic exposure. Since the 2009 publication of RAGS Part F, the scientific best practice for evaluating nonresidential inhalation exposures has been to use an ET of 8 hours per day for a chronic exposure scenario. This can either be applied using an ET of 8 hours per day in the intake equation or by multiplying criteria calculated prior to 2009 by a factor of three (3). Because the calculation of intake is linear, as stated previously, the hours of exposure can be directly scaled from the total number of hours in a day. For example, the scaling factor (i.e.,	of the average individual is not consistent with the USEPA risk assessment guidance which is to protect for the reasonable maximum exposure. Basing the generic criteria on protection of the average worker does not adequately protect the majority of workers across the state. Furthermore, there is no competitive disadvantage to Michigan's economy when the comparison indicates the resulting DEQ values using an exposure time of 12 hours are comparable to those values used for neighboring states. In the absence of statistical data to determine an exposure time other than 8 hours, the statutory language must be used for guidance. Only reasonable and relevant exposure pathways are used in determining generic human health exposure assumptions [Section 20120a(3)]. Revisions to the cleanup criteria must be based on the statutory charge to incorporate knowledge gained through research and studies in the area of fate and transport and risk assessment, and to take into account best practices from other states, reasonable and realistic conditions and sound science. Without specific empirical data, common knowledge and readily available information that represent reasonable and realistic conditions for various types of job duties should be considered. Workforce hours for significant workforce populations include those who work more than 50 hours per week (more than 10 hours per day). A May 2016 poll of working adults in the U.S. by National Public Radio, the Robert Wood Johnson Foundation, and Harvard T.H. Chan School of Public Health was conducted to examine workers' perceptions of health problems, experiences, issues, and challenges in the workplace. The survey	

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			multiplier) would be 24 hr / 8hr or three (3). Because the intake equation is linear, an adjustment to account for a standard 8 hour work day should not be difficult, regardless of limitations in the DEQ's "calculator". In fact, USEPA recommends a typical worker ET of 8 hours per day in its current Standard Default Exposure Factors (2014). In addition, all states that have updated their approaches subsequent to 2009 also incorporate the ET term and use 8 hour per day for generic nonresidential scenarios, referencing USEPA's RAGS Part F and USEPA's current Standard Default Exposure Factors (2014). Michigan continues to put its economy at a competitive disadvantage, in contrast to the legislature's direction in Section 20102, by not automatically incorporating an ET of 8 hours per day into its generic criteria and implying that working 12 hours per day, 238 days a year, for 20 years could be reasonable. This is virtually impossible and is not consistent with the intent of a reasonable maximum exposure or the generic criteria to develop exposure scenarios which fall within the "typical" range. Further, no justification has been provided to demonstrate why the USEPA's assumption of an average 8 hours per day work week is inadequate, and why the DEQ instead believes a 12 hour exposure represents an RME that is "reasonable and relevant" per 324.20120a(3). Using 12 hours of daily worker exposure (i.e., exposure time or ET) for the typical worker exposure remains a poor and unscientific assumption, violates the statutory intent, and continues to ignore CSA principles and recommendations which the DEQ accepted. Specifically, Recommendation 2.12 states "the CSA recommends the use of the nonresidential exposure values TAG 2 presents in Table A (Appendix B of the TAG 2 report) and the TAG 2 decision framework to select the nonresidential exposure values." Appendix B of the report produced by TAG 2, which included DEQ representatives, shows only a single nonresidential exposure time of 8 hours/day. Using an 8 hours/day assumption for a working day would be consistent with the CSA and the value used by both USEPA and our neighboring states.	found "Almost one in five (19%) of working adults say they work 50 hours or more per week in their main job." 85% of the total respondents indicated they worked mainly during daytime hours on weekdays, reflecting 10 hours or more per day. Similarly, the Bureau of Labor Statistics reports that among managers and professionals, 28 percent work 49 or more hours per week (https://www.bls.gov/opub/btn/archive/are-managers-and-professionals-really-working-more.pdf). A review of job listings from Indeed.com, an American worldwide employment-related search engine for job listings was conducted by DEQ staff. These listing were for Michigan jobs where the listing indicated 10-12 hour shifts. 88 entities had listings in more than 60 communities, located throughout Michigan. The majority of the job listings were entry level positions that would be consistent with the nonresidential exposure frequency (238 days). While not inclusive, since it only represents companies currently hiring that are included with Indeed.com and all listings were not reviewed, it provides support that there is a significant Michigan workforce population that should be considered as a reasonably conservative estimate. If not included, this workforce would not be protected by the generic criteria. To further evaluate, the DEQ contacted the US Department of Labor, Bureau of Labor Statistics and was provided with a link to the raw data for their statistics. Data was extracted and compiled as national data sets and Michigan-specific data sets for January 2007 through June 2017. The 95th percentile was calculated of hours worked per week for each monthly data set. The annual Michigan 95th percentile of hours worked ranged from 56 to 59 hours with an average of 57 hours, or 11.4 hours	

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			Recommended Action Exposure time must be appropriately accounted for in all inhalation exposure scenarios (and criteria). For the nonresidential exposure scenarios, the exposure time must be representative of typical worker exposures, recognizing full-time employment is working 30 to 40 hours a week. The current and best available science (i.e., RAGS Part F and 2014 Standard Default Exposure Factors), which is used by USEPA Region 5, Michigan's neighboring states, and recommended by the CSA, should be used and the nonresidential exposure time should be 8 hours per day. Further, the DEQ must remove from its October 2016 draft rules all language implying that chronic exposures of 12 or 24 hours per day are reasonable for typical exposures represented by the RME. Specifically, MMA recommends that the DEQ either change its calculator to reflect the 8 hr/day exposure or, although not ideal, modify Rules 26(10) and 27(14) to affirmatively state that the generic non-residential criteria in the tables of Rule 46 will be adjusted to "represent an 8-hour work day by multiplying the generic VSIC and PSIC criteria and Tier 3 of VI criteria in Rule 49 by 3." If the DEQ does not make changes to the generic criteria tables in Rule 46 it should footnote the applicable values so that parties will be directed towards the specific rule that highlights the necessary adjustment.	per day assuming a 5 day work week. The national results ranged from 57 hours to 60 hours with an average of 59 hours, or 11.8 hours per day assuming a 5 day work week. Adjusting work day hours worked for hours of exposure time (e.g., lunch break); the Michigan results rounds to a 12 hour exposure time. Therefore, based on readily available identifiable data, the DEQ determined that a 12 hour work day as exposure time represents an appropriate RME for 95% of Michigan's workforce and is consistent with USEPA recommended use of an upper-end estimate of this assumption. The DEQ has reviewed the language of CSA recommendation 2.12 and Table A of Appendix B of the TAG-2 Report and the comment appears to be based on a misreading of this language. The recommendation clearly implies further evaluation of all the exposure assumptions is expected and Table A clearly states the exposure factors identified in the table are not recommendations of the TAG. Based on comments received the DEQ further reviewed the proposed language regarding site-specific adjustment of exposure time. It was determined that in order to be consistent with statutory provisions for remedies to be reliable, effective and enforceable to protect public health, safety, welfare, and the environment, that a site-specific modification of exposure time must be based on a nonresidential land use that by its nature would only allow activities for a limited exposure. The nature of the land use would result in a RME less than 12 hours, such as a self-storage facility or a warehouse.	
		CHAMBER	Exposure Time (ET) is a standard term in all inhalation risk equations that have been updated subsequent to USEPA's RAGS Part F (2009). The absence of this term, in essence, creates an inappropriate assumption that a worker would spend its entire 24 hours at work, which is inconsistent with the CSA Guiding Principles to use "reasonable and practical" exposure assumptions. As such, the ET term has been added to all inhalation equations in Part 201 proposed rules. The default values are the same as USEPA's default values of 24 hours/day (i.e., assuming a full day of exposure) for residential exposure and 8 hours/day (i.e., assuming the standard 5-day/40-hr work week) for nonresidential exposure that		

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			are used in RAGS Part F and the Regional Screening Levels. Revise equations involving the inhalation pathway to account for an appropriate exposure time. The ET should be as follows: -residential ET of 24 hours/day -nonresidential ET of 8 hours/day	The commenter's have requested updates of the criteria tables to include the revision for exposure time. • There are no criteria tables for the VIAP pathway. The VIAP tables represent Tier 1 screening levels. The screening levels are not appropriate to adjust for nonresidential exposure time. • The source size of the generic nonresidential VSIC and PSIC must be modified to account for source size prior to adjusting for exposure time.	
		ARCADIS	*9-13-2016*: The proposed equations and DEQ criteria for the inhalation pathways (i.e., Volatile Soil Inhalation Criteria, Particulate Soil Inhalation Criteria, AAVs, and vapor intrusion criteria) do not account for a portion of the day spent at sites for the different exposure scenarios. For example, only a portion of the day (e.g., 8 to 10 hours) is spent at an industrial site. Arcadis recommends that an exposure time component be added to the criteria for the inhalation pathways, consistent with the 2009 USEPA Risk Assessment Guidance for Superfund (RAGS) Part F equations (USEPA 2009) and the USEPA Regional Screening Levels (USEPA 2016). *10-18-2016:* The proposed equations and DEQ criteria for the inhalation pathways (i.e., Volatile Soil Inhalation Criteria, Particulate Soil Inhalation Criteria, AAVs, and vapor intrusion criteria) still do not account for exposure time. Rather, the assumption is that for each exposure scenario, an individual is present at the site for 24 hours a day. This is generally not the case, especially for non-residential exposures. Additional text was added to Rule R 299.26(10) to indicate that the inhalation-based criteria may be adjusted with the exception of constituents with a single exposure developmental endpoint and a few other constituents. Arcadis recommends that the exposure time term be added to the inhalation-based criteria equations (including residential equations) and that the appropriate default exposure time term be used, consistent with the 2009 USEPA Risk Assessment Guidance for Superfund (RAGS) Part F equations (USEPA 2009) and the USEPA Regional Screening Levels (USEPA 2016). A footnote can be added to the few constituents that do not follow this modification due to the use of acute or short-term		

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			inhalation reference concentrations, as these are the exception, rather than the norm. Building the exposure time term into the equation will help ensure the criteria are applied consistently across projects.		
		WEC	*10-17-2016*: There are several exposure assumptions in the criteria calculations that appear to be difficult, if not impossible, to replicate in the environment and, thus, these criteria standards should be recalculated. Specifically, exposure timeframes previously assumed a 24-hour worker exposure which could not possibly be considered an accurate exposure scenario. The DEQ states in the revised proposal that it has modified the rule based upon a 12-hour workday exposure. In discussions with DEQ's senior management, it was acknowledged by DEQ that this change was based upon the "possibility" of a 12-hour workday, but also admitted that "the math was easier" in adjusting the criteria by simply reducing the criteria limit by 50%. It would seem that a 12-hour worker exposure is still unrealistically conservative and, if the math was easy in a linear equation at 50%, it should be just as easy at 33%. It also appears as though the clean-up criteria table and the footnotes of the table need to be adjusted to reflect a change in the exposure calculation approaches. This should be done prior to the promulgation of the rule.		
26	Overall	MMA	R 299.26 (soil inhalation ambient air): change the rule to clarify that the pathway is not relevant if a suitable exposure barrier is in place and the barrier is reliably permanent in nature or construction, or is made permanent by a land or resource use restriction.	See response for Rule 2(h) – relevant pathway definition.	None
26		BARR	*10-3-2016*: The mercury non-residential 2 meter and 5 meter finite VSIC does not appear to have been updated from the April 15, 2016 version of the draft rules… based on my calculations the 5 meter VSIC for mercury should be 1500 and not 1.8e+5.	The VSIC values for mercury were revised in response to this comment.	Rule 46(2)-Table 2
26	(10) Equation 10	MMA	These criteria appear to have been calculated incorrectly for all applicable substances and as a result, appear to be grossly less stringent than intended by a factor of over 100. This means that the cleanup criteria in the proposed	On 9-29-2016 the equations and the calculated values were revised in response to this comment.	No further rule revision is required

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			tables appear to be about 100 times higher than the protective concentration that the DEQ intended to publish. These errors are very serious because these generic soil criteria, which are based on the volatilization of these substances to outdoor air, can be controlling criteria for soil clean-ups where the VOC source is below the ground surface. In other words, these errors are not academic, they would directly affect the extent of soil remediation of VOCs at many sites in Michigan. In this case, the error would mean that soil clean-ups to these Finite VSIC would fall far short of the intended protective cleanup levels. Our experts noticed these apparent errors when they could not understand how the proposed Finite VSIC values became so much less stringent (higher published concentration) when compared to the existing Finite VSIC criteria, even though DEQ is proposing relatively small changes to the inputs for the VSIC calculations. In attempting to determine the cause of the errors, our experts were hampered by not having access to the DEQ's calculations because the DEQ has not provided the public with details of its calculations for these criteria or other criteria. Based on our review we have determined that the has apparently made two gross errors that DEQ partially offset each other. The first gross error by itself would have caused the Finite VSIC criteria to be too stringent than necessary (the published criteria would appear to be much lower than intended) by a factor of 8,640. This is an enormous error and I will show you just how significant this is in just a minute. Although it took our experts time to understand the root cause of the error, it appears to be due to a failure by the DEQ to simply use the correct units in the calculations. The second gross error by itself would have caused the Finite VSIC to be not stringent enough (the published criteria would appear to be much higher than intended), this time by a factor of 1 million. This error appears to have been cause by a failure to include a factor of 1		

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			million in the equation for calculating the Finite VSIC. This error is particularly troubling because the existing rules have the correct equation. Although the gross errors with the Finite VSIC are serious by themselves and clearly need to be corrected in the rules, the larger concern is with the potential that the proposed rules contain other yet undiscovered errors and omissions. Unfortunately, this potential is far from hypothetical, given how MDEQ made such basic errors with the Finite VSIC and failed to catch them even though they are readily apparent.		
26	(10) Equation 21-22	BARR CONSUMERS	*9-13-2016*: What is the source of the average speed of 25 mph in a 0.02 km driveway? This is not reasonable based on acceleration time and braking distances. *10-18-2016:* Comment resubmitted	The DEQ has addressed this issue by removing the emissions due to vehicle traffic (Ev) from the generic PSIC equation and the generic scenario will assume paved roads. The presence of unpaved roads will require a site-specific evaluation. Additional guidance for calculating a site-specific Ev will be provided with the Criteria Resource Materials.	Rule 26(11) equation 19, Rule 46(6) Table 2 and 3
26	(10) Equation 10	BARR	The EMSOFT Normalized average flux output is not properly converted as required by the equation. Tables 2 & 3 should be republished with the corrected values.	Revisions were made in response to this comment on 9-29-2016.	No further rule revision is required.
26	(10) Equation 10	BARR	A term from the current VF equation was not included in the proposed equation. Why was the term eliminated?	Revisions were made in response to this comment on 9-29-2016.	No further rule revision is required.
27	Overall	Based on comments received the format for this rule has been substantially modified. The subrule numbering for the proposed rule revisions do not consistently match the numbering for the comments provided. The changes have been noted with the response to comments.			
27	Overall	ARCADIS	The proposed Tier 1 (promulgated) screening levels are all based on a residential scenario. This is inconsistent with the promulgated criteria for other pathways (e.g., soil direct contact, drinking water), which have both residential and non-residential criteria. The Tier 1 screening levels for vapor intrusion are also based on sand only, which is inconsistent with other pathways which can account for differing soil types while still being considered "generic" criteria. The AAVs for residential and non-residential scenarios are	The VI Tiered approach is unique to VI and is not expected to be entirely consistent with the other exposure pathways. The VI Tier 1 values are screening levels that are used to identify a potential source of vapors. The screening levels identify when further evaluation of the pathway is necessary. For that purpose they are applicable to residential or nonresidential scenarios. The use of screening values, applicable to residential or nonresidential scenarios, and the requirement of	None

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			not presented in the draft Rules making the calculation of Tier 2, 3A, and 3B values difficult. Arcadis recommends that the residential and non-residential AAVs be presented in order to make the vapor intrusion criteria and screening levels more transparent.	further evaluation are similar to the requirements when concentrations exceed other screening levels (FESLs or Csat). VI Tier 2 criteria are designated as unrestricted residential criteria; and VI Tier 3A criteria represent restricted residential or nonresidential scenarios. All pathway criteria developed using soil type inputs are based on the soil-type "sand" with the option to develop facility-specific generic criteria under Rule 7. The AAVs are calculated pursuant to Rule 27(14). The Acceptable Air Concentration (AAC) for a hazardous substance is the minimum of the calculated AAVs for that hazardous substance. The AACs are not criteria that should be promulgated in the criteria tables. The DEQ intends to publish AACs as part of the updated DEQ vapor intrusion guidance.	
		HALEY	Input values for Tier 2 and Tier 3 values should be expanded, and the use if indoor air data should be clearly recognized. The Tier 2 and Tier 3 values do not allow for modification of the assumption that a soil source is directly beneath the building floor, but only allow for modification of the soil temperature and soil type. Based on this, it is likely that most sites with VOC issues in vadose zone soil will require measurement of soil gas to evaluate compliance. This outcome could be unnecessarily burdensome, and potentially unrealistic. For example, in cases where groundwater is in contact with the floor and/or the capillary fringe extends to the floor, it is usually not possible to collect soil vapor samples (sub-slab soil gas) due to the saturated conditions in the soil pore spaces. Under such circumstances, VI can typically be evaluated by collecting indoor air data. However, there does not	The collection of indoor air samples may be appropriate for evaluation of the immediate or short-term risk to determine if mitigation or interim response activities are required. However, due to the inherent variability of the indoor air concentrations, reliance on indoor air data would not be appropriate for facility determination or generic closure based on satisfying generic VIAP criteria. It may be possible that indoor air samples are collected in a site-specific evaluation (VI Tier 3B) and evaluated as a line of evidence to support that an unacceptable risk to human health will not occur, especially when there is not adequate vadose zone soil due to saturated conditions shallow groundwater to allow a vapor sample to be	

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			appear to be an option for using indoor air data to evaluate Part 201 compliance. The regulations need to bring in the ability to use indoor air data to evaluate health risks and Part 201 compliance. The proposed rules appear to remove criteria for indoor air. Concentrations of constituents in indoor air, if collected, should be the governing data since this is the location for which we are required to be protective. Proposed modification to proposed DEQ change: Retain indoor air cleanup criteria and indicate that indoor air samples can be used to determine whether remediation and/or mitigation is required.	collected. The specifics of such an evaluation are outside the scope of the rules for developing the generic cleanup criteria.	
27		INNES	The provisions for evaluating the volatilization to indoor air pathway ("VAIP") described in Rule 299.27 are inconsistent with the concept for evaluation of all other pathways: that changes to the land should not affect facility status. The very first step involves developing a CSM to determine if the pathway is relevant. The absence of a building would make the pathway not relevant and thus the property would not be a facility. However, future construction is possible. This divergence is also in the (1)(e), the definition of the lateral inclusion zone: "that may make a property or structure" – The absence of a building in the zone would make the property not a facility. In addition, the text of (1)(e)(iii) is inconsistent with the concept of the Tier 1 Screening. If source concentrations are below the screening level, the property would not be a facility. Having such an open ended definition for lateral inclusion zone makes defeats the concept of a tiered approach. Rule 27 (5)(c) states that an exceedance of the Tier 1 screening levels requires additional evaluation for persons proposing or implementing response activities. However, as written, concentrations above Tier 1 screening levels do not make a property a facility. This continues the inconsistent approach of this section of the rule. The approach for evaluating the VAIP pathway should be revised.	The presence of an existing or potential future building must be considered to evaluate the VIAP. See response to comments for Rule 2(h) – definition of relevant pathway. By definition a facility is based on the presence of contamination above cleanup criteria for unrestricted residential use; not the absence or presence of a structure; or whether the pathway is relevant. With respect to commenter's assertion regarding Rule 27(5)(c) [now Rule 27(8)(c)], the tiered approach to this pathway requires "further evaluation" which is by definition considered a response activity. This is consistent with the CSA recommendation to develop the VI tiered process, and is consistent with the requirements for further evaluation when concentrations exceed other screening levels (FESL, Csat).	No rule revision required.

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27	Overall	MMA	Failure to use recently issued ITRC approach for screening of petro releases relative to VI concerns.	ITRC documents or requirements are not standards that can be adopted by reference within the rules. Although not specifically referenced, the proposed rule incorporates the ITRC approach for petroleum releases. This includes: Rule 27(1)(f)(i) defines and establishes the lateral inclusion zone from petroleum vapor source The "Lateral inclusion zone" is defined as the horizontal distance beyond a vapor source that may make a property or existing or potential structure vulnerable to the migration of vapors. In addition to including 30 feet from the extent of a petroleum vapor source, it also includes 100 feet from the extent of all other vapor sources. Rule 27(11)(c) allows for the use of DEQ approved petroleum models to develop site-specific criteria. Consistent with the ITRC petroleum vapor intrusion guidance, the use of a petroleum model (such as Biovapor) requires site-specific information to evaluate the potential for vapor intrusion. Proposed Rule 27(9) allowed the DEQ to establish a vertical petroleum separation distance. As part of the Phase II Stakeholder Process this was further discussed. The subrule [now Rule 27(12)] has been modified to reflect the vertical separation distances for petroleum vapor intrusion as provided by ITRC guidance.	Rule 27(1)(c) Rule 27(1)(f) Rule 27(12)
		API	The failure by the DEQ to adopt the logical screening criteria for petroleum vapor intrusion (PVI) that has recently been developed (2015) by the Interstate Technology and Regulatory Council (ITRC) with Michigan's assistance. The ITRC guidance clearly states that RBSLs for soil and groundwater have limited value in petroleum vapor intrusion (PVI) risk assessment and are not technically defensible. Risk Based Screening Levels (RBSLs) derived without consideration of biodegradation will be overly conservative and drive unnecessary data collection and/or unneeded mitigation at numerous petroleum sites. The industry would caution the DEQ against promoting and promulgating RBSLs for petroleum hydrocarbons that cannot be supported by sound science.		
		GES	The proposed changes to VI do not list clear set back distances (lateral/vertical) for impacted soil, groundwater, and NAPL. The only setback distance that is listed is the lateral inclusion distance for petroleum contamination of 30 ft. With the lack of defined values, are we to assume that the values utilized by ITRC in their documents will be acceptable to the DEQ?		
27	Overall	HALEY	Part 201 VI values for groundwater are based on overly conservative and unrealistic assumptions. Part 201 VI values for groundwater are based the assumption that groundwater is in direct contact with the building floor slab/foundation and model using formulas which assume direct vaporization into buildings. This is extremely conservative and does not reflect the majority of buildings in Michigan resulting in extremely low screening values. This approach conflicts with USEPA and	See response to comments for Rule 27(3)(f). This comment appears to be based on a misinterpretation of the difference between facility-specific and site-specific input values. VI Tier 2 and 3A allow for facility-specific inputs pursuant to the provisions of Rule 7, and Rule 27 – Table 1. VI Tier 3B allows for the use of site-specific	No further rule revision required specific to this comment.

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			many other states which rely on use of generic attenuation factors and assume a groundwater-building separation distance. Proposed modification to proposed DEQ change: Adopt assumptions made by USEPA for setting screening criteria. We support the use of modeling when moving to Tier 2 and 3, since modeling allows for site-specific input values as opposed to generic attenuation factors.	inputs and alternative modelling to develop site-specific criteria. This rule was modified on 9-29-2016. Additional revisions to this rule were made based on comments received. Further explanation is provided throughout the responses for Rule 27.	
		WEC	*10-17-2016*: The specific exposure assumptions in Rule 27 also need to be recalculated. As currently proposed, the exposure assumption for impacted groundwater inside of a structure assumes a 44 inch diameter opening in the floor where impacted groundwater may volatilize. However, a standard sump basin is less than 15 inches in diameter. It seems difficult, if not impossible, to imagine a sump or other exposure to impacted groundwater at the level assumed in the exposure algorithm currently reflected in Rule 27. This exposure assumption should be revised to be more realistic.	See response to comments for Rule 27(3)(f).	
27	Overall	HALEY	We agree that the evaluation of soil data is an important MLE consideration, but the derivation of soil criteria is not clear and seemingly inconsistent with other Part 201 assumptions. We support that Tier I values offer the ability to use soil data, as opposed to soil vapor data, to evaluate compliance. Whereas the criteria assume that the soil VOC source is directly beneath the building floor slab, it also assumes that a residential building is slab-on-grade. This contradicts the basis of the groundwater criteria. That said, soil criteria would be even lower if a basement was assumed.	Rule 27(2)(d) requires VIAP to be evaluated using soil, groundwater, and vapor. See response to comments for Rule 27(2)(d) for further explanation. The exposure scenario for shallow groundwater assumes the residential structure has a basement which is also protective for a slab on grade structure. A modification to the mixing height was identified as being necessary to address this comment. The former proposed Rule 27(6)(c) has been removed. Further explanation of the assumptions for the scenarios will be provided in the DEQ Criteria Resource Materials.	Rule 27(16) Table 1
27	Equation	CONSUMERS	The “Acceptable air concentration (AAC)” term was inconsistently identified as "Acceptable air value (AAV)” in certain equations. The references to AAV have been updated to AAC. Correct typo appearing in several locations; no substantive changes.	The term acceptable air value was appropriately used. The AAVs are calculated pursuant to Rule 27(14). The AAC for a hazardous substance is the minimum of the calculated AAVs for that hazardous substance.	None

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27	(1)(a)	MMA	Modified subrule language provided for air exchange rate definition.	This definition was modified in response to this comment.	Rule 27(1)(a)
27	(1)(b)	MMA	Appear by definition AACs can only be developed for hazardous substances defined as volatiles. Modified subrule language provided for AAC definition.	This definition was modified in response to this comment.	Rule 27(1)(b)
27	(1)(c)	MMA	Modified subrule language provided for capillary zone definition.	This definition was modified in response to this comment.	Rule 27(1)(c)
27	(1)(d)	MMA	Modified subrule language provided for CSM definition.	The CSM definition is consistent with other states' CSM definitions.	No further rule revision is required.
		BARR CONSUMERS	9-13-2016: The CSM definition should be modified to include "and/or" to allow for basic and advanced CSMs *10-18-2016*: The "and/or" should be incorporated to allow for basic and advanced CSMs.		
		CONSUMERS	9-13-2016: The term ecological receptors should be removed from the definition of CSM since they are not included in the criteria calculations.	On 9-29-2016 this subdivision was modified in response to this comment.	
27	(1)(e)	MMA	Modified subrule language provided for lateral inclusion zone definition.	This definition was modified in response to this comment.	Rule 27(1)(e)
27	(1)(g)	MMA	Modified subrule language provided for vapor intrusion definition.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario; therefore, the suggested modification is inappropriate.	None
27	(2)(d)	MMA	Modified subrule language provided for groundwater, soil and vapor samples.	This language is consistent with the statutory requirement that pertinent criteria must be satisfied in affected media [MCL 324.20120a(14)]. The language in Rule 27(2)(d) establishes that a vapor sample may be used as the best available information. This was further discussed as part of the Phase II Stakeholder process. The subrule was revised to clarify that the location of the media sample is aligned with the location of the vapor source within the lateral inclusion zone. Figures and examples to illustrate the rule provision will be provided in the DEQ Criteria Resource Materials. Input to VI Models, as identified by the commenter, are only necessary to collect when a person is proposing to conduct a site-specific evaluation	Rule 27(2)(d)
		HALEY	Multiple Lines of Evidence (MLE) evaluations for VI should not need to include data for all media in all instances. R 299.27(2)(d) states "The VIAP shall be evaluated using soil, groundwater, and vapor samples to satisfy criteria for each media…" This section implies that data for all three media are required and that comparisons to criteria must be made for all media. The CSM for vapor transport includes consideration of diffusive transport from sources of volatile organic compounds (VOCs) dissolved in groundwater and from those in unsaturated soils, if present, as well as advective and/or convective transport and transport via preferential pathways. Proposed modification to proposed DEQ change: Indicate that the practitioner must collect the appropriate data, which may or may not include soil, groundwater, and/or soil vapor samples. Revise the rule to indicate that "The		

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			VIAP shall be evaluated using the appropriate sampling (i.e. soil, groundwater, and/or vapor samples) required to provide the appropriate inputs to VI models…." Adequate soil and groundwater characterization may preclude the need to obtain soil vapor data, the collection of which is not always possible. R 299.27 (2)(d) suggests that soil vapor data take precedence in evaluating compliance, stating "A vapor sample may be used as the best available information to represent in situ conditions at the facility for evaluating a vapor source and the ability to migrate when comparing samples that are collocated or similarly located." It is not always possible to collect soil vapor (due to owner preferences, depth to water, and other factors). Additionally, as is currently written, a DEQ PM could interpret this to require that soil vapor sampling be conducted in all cases when soil and groundwater data do not exceed vapor intrusion criteria. Proposed modification to proposed DEQ change: Modify the language as follows: "If able to be collected and other lines of evidence indicate exceedances of VIAC, then a vapor sample may be used as the best available information to represent in situ conditions at the facility for evaluating a vapor source and the ability to migrate when comparing samples that are collocated or similarly located." MLE should be weighed by the practitioner. R 299.27(2)(d) is not clear what responses would be required, for example, if different media showed different results (e.g., groundwater exceeded a criterion but soil vapor did not.) In the example provided, if soil vapor is below criteria, remediation or mitigations for VI should not be required. Proposed modification to proposed DEQ change: R 299.27(2)(d) should recognize that these conflicting information are common outcomes of investigations resulting in a need for flexibility by the practitioner to use MLE to interpret data in many cases. Part 201 implies uncertainty even if compliance with Part 201 VI criteria for soil and groundwater is achieved.	under VI Tier 3B, and not necessary for implementation of the generic criteria.	

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27	(2)(d)(iii)	HALEY	R 299.27 (2)(d)(iii) states that "A vapor source may be present and represent a risk to human health when the concentration of a hazardous substance in soil or groundwater does not exceed the criteria that are based on the target detection limit." This statement is open ended and does not provide a process to determine when enough samples or media have been collected. This potentially provides the DEQ with the ability to require endless sampling of media even if soil and groundwater concentrations are below the threshold. Proposed modification to proposed DEQ change: Strike R 299.27(2)(d)(iii).	Rule 6(8)(a) states that if a calculated health-based value is less than the target detection level (TDL) for that hazardous substance in a given medium that the TDL is the cleanup criterion. The provision in Rule 27(2)(d)(iii) that notes that even if soil or groundwater criteria based on the TDL are not exceeded that there may be a vapor source which presents a risk to human health provides clarification and support for the provision in Rule 27(2)(d)(iv) that allows a vapor sample to be used as best available information to represent in-situ conditions.	None
27	(2)(d)(iii)	MMA	Modified subrule language provided to add "volatile",	See response to comments for Rule 2(k).	None
27	(2)(d)	MMA	Proposed subrule (2)(d)(v) provided for methane VI evaluation.	See response to comments for Rule 49(1)(K), (AA) and (GG)	None
27	(3)(b)	MMA	Modified subrule language provided to revise to groundwater NOT in contact	This provision was modified in response to comments. It is now included in the definition of vertical separation distance and used with the assumptions for shallow groundwater.	Rule 27(1)(l) Rule 27(3)
27	(3)(c)	MMA	Modified subrule language provided for groundwater in contact to be site-specific	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario from the generic approach.	None
27	(3)(c)	MMA	Modified subrule language provided as subrule (3)(d) to revise concentration to screening level.	This provision is now included in Rule 27(5). The language was modified to address other comments.	Rule 27(5)
27	(3)(e)	MMA	This proposed rule essentially claims that the risk from inhalation of VOCs during a single flooding of a basement with contaminated groundwater is the same as that from continuous flooding of the basement over a 32 year period, for substances the DEQ is designating as "single event" chemicals. For example, the "new" VIGWIC for TCE is the previously proposed health-based value of 0.073 ug/L, which was calculated assuming exposure to groundwater flowing through a basement for 32 years. The absurdity of this claim stems from the DEQ's inappropriate application of chronic toxicity values to a short-term exposure scenario. The inconsistency between that and basic toxicology principles as well as regulatory	This provision is now Rule 27(3)(b) The approach reflects a single event, acute or short-term scenario that may affect human health, and based on Michigan-specific data, may occur. The substances that are identified as having the potential to cause adverse human health effects for less than chronic exposures are identified in Rule 49(1) Footnotes (DD), (EE), & (FF). See response to comments for Rule 49(1) Footnote (DD) and former Footnote (QQ) for short-term exposures. In response to this comment, the single event exposure needs only to occur once, not repeatedly	Rule 27(3)(b)

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			practice of USEPA and surrounding states was discussed in MMA's prior comments. In addition to the inappropriate application of toxicity values, this scenario is even further removed from the "typical range" scenario intended for generic criteria by using worst-case exposure assumptions. It defies common sense to claim that the risk from inhalation during one flood is as great as that from daily exposure for 32 years of flooding. Recommended Action For the reasons discussed in more detail in the prior MMA comments, the DEQ should delete Rule 27(3)(e).	over the assumed 32 years of occupancy. The weight of scientific evidence for prenatal exposure to many hazardous substances shows that a single exposure during a critical window of development can cause irreversible adverse outcomes for those offspring. Single event developmental exposure durations are only calculated when the hazardous substance noncancer toxicity value is based on a prenatal exposure resulting in developmental adverse effect(s) that includes mortality, a structural abnormality and/or a functional abnormality. Multiple USEPA guidance documents and USEPA risk assessment practice for developmental toxicity and prenatal exposure is for a single event or acute exposure scenario, unless the adverse effect is only altered growth. The single event or acute exposure scenario use is consistent with recent (2015) USEPA guidance for TCE exposure related to vapor intrusion, and with USEPA risk assessments for exposures to TCE (2014) and n-methylpyrrolidone (2015) conducted under the Toxic Substance and Control Act. Similarly, the inhalation risks from the hazardous substances with acute or short-term toxicity are based on less than 32 year exposures and are calculated for the limited exposure duration.	
27	(3)(f)	MMA	10-18-2016: The revised groundwater vapor intrusion values based on groundwater in contact with a structure (VIGWIC) in R 299.27(3)(f) retain many of the flaws that were previously discussed in the MMA's Sept. 13, 2016 comments on the DEQ's April 2016 Rule 27 proposal. The flaws in this revised approach include: • VIGWIC are still derived on the basis of exposure assumptions that do not represent a "reasonable and relevant exposure pathway" as required under 324.20120a(3). • It contradicts the recommendations of TAG 3 to derive groundwater vapor intrusion criteria based on	Groundwater in contact with a structure has been revised as shallow groundwater, the provisions are now included in the definition of vertical separation distance and the assumptions for development of screening levels or generic VIAC for shallow groundwater. An important part of the tiered approach is that the VI Tier 1 screening levels do not automatically result in VI Tier 2 generic criteria (i.e., "Facility" designation). The only instance where VI Tier 1 screening levels would be the same as the VI Tier 2 generic criteria is when the soil type is sand and	Rule 27(1)(l) Rule 27(3)

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			groundwater at a depth of at least 3 meters and not in contact with a structure. Thus, the revised approach continues to contradict the CSA's recommendation that the DEQ itself agreed to implement. • It contradicts the basic conceptual model that USEPA and surrounding states use for deriving generic groundwater vapor intrusion criteria. • It incorporates a serious flaw from Rule 27(10)(d) which the prior MMA comments discussed in detail. Because of these flaws, the revised approach still produces criteria that fall far short of the CSA's goal for the update of Part 201 to use sound science and good judgment in calibrating the generic criteria so that only sites with a real potential for concern are brought into the evaluation process. The result of poorly calibrated criteria is that properties which represent minimal risk will be brought into the Part 201 process, potentially diminishing the prospects for redevelopment and requiring the state, land owners and property developers to unnecessarily devote resources to address the regulatory issues. At the outset of the Part 201 criteria re-evaluation effort in 2014, all stakeholders, including the DEQ, agreed on the following: "It is critically important during this re-evaluation of the Part 201 rules that the generic cleanup criteria be appropriately calibrated to ensure that sites of real concern are identified and addressed—and that sites with minimal potential for public health or environmental harm are not inadvertently brought into the Part 201 process." As shown in the table below, the revised VIGWIC are still not properly calibrated. The table also includes DEQ's target detection limits, proposed health-based drinking water criteria, and USEPA's vapor intrusion screening levels (VISLs): As show in the table, the revised VIGWIC for most of these common volatile organic compounds (VOCs) are so low that they are near or below DEQ's target detection limits (TDLs). This means low-level detections of these	groundwater is shallower than 3 meters, which is not addressed by the TAG 3 recommendations. If the groundwater is greater than 3 meters, which was addressed by TAG 3, the approach is very similar. Additional comments related to items identified by the commenter are as follows: **Reasonable and relevant pathway:** The DEQ is required by statute to develop cleanup criteria based on generic human health assessment assumptions to appropriately characterize patterns of human exposure, using only reasonable and relevant exposure pathways [MCL 324.20120a(3)]. Michigan-specific data demonstrates that shallow groundwater is a reasonable and relevant exposure pathway consistent with statute. This data also documents that the majority of the state can be expected to have shallow groundwater less than the depth of a basement (3 meters). US Census data document that a vast majority of existing and future homes are constructed with a basement. To ignore the common condition that this data represents would be contrary to statutory requirements. The necessity to use this data in developing criteria is not an arbitrary assumption. The statutory provisions also allow the DEQ to prescribe more than one generic set of exposure assumptions within a category. Consistent with this provision, there are several exposure assumption scenarios for the VIAP cleanup categories, including shallow groundwater and groundwater that is deeper scenarios. Accepting the commenter's suggested approach to remove the shallow groundwater screening levels, not only precludes the use of the generic cleanup criteria for a majority of the sites throughout the state including sites in most of the highest populated areas, it requires that a majority of the sites complete a site-specific evaluation. This would prevent self-	

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			VOCs in groundwater at a property would make the property a Part 201 "facility", because the VIGWIC are still proposed to be used not only as Tier 1 screening levels but also as Tier 2 criteria; TAG 3 recommended using Tier 2 criteria for determining if a site is a Part 201 "facility", not Tier 1 screening levels. Clearly, the revised VIGWIC would identify many properties as a Part 201 "facility" requiring development of response activities in accordance with Part 201 even when VOCs are barely detectable and the site has minimal risks. The table also shows that the revised VIGWIC for most of these VOCs are still below health-based drinking water criteria. The fact that many of these VIGWIC are far below the drinking water criteria and USEPA's VISLs demonstrates the VIGWIC are lower than needed to be protective. As noted above and discussed further below, the reason the revised VIGWIC are still so low is that they were calculated using models and assumptions that do not represent sound science or good judgment. The revised approach no longer calculates the VIGWIC based on the assumption that basements are flooded continuously with contaminated groundwater as in the DEQ's April 2016 proposal, but it uses other models and assumptions that are not appropriate for the derivation of generic criteria because they apply bad science and poor judgment. Specifically, the approach assumes that contaminated groundwater is constantly in contact with a basement, and flows continuously through a large, open (uncovered) pit in the basement which emits VOCs from the pit into the basement air. In addition, the approach assumes that VOCs from groundwater in contact with the underside of the basement diffuse through the intact concrete floor at a rate that is about 1,000 times higher than is expected based on engineering calculations provided in the prior MMA comments. The 1 m2 specified in Rule 27(3)(f)(i) for the "surface area of a sump and the extent of cracks in the building footprint" is unreasonably large. Since the DEQ's proposed crack area is 0.04 m2, the DEQ is apparently	implementation and result in unnecessary added costs to the party proposing response activity. **Generic cleanup criteria should be appropriately calibrated:** The DEQ does agree that it is critically important during this re-evaluation of the Part 201 rules that the generic assumptions are appropriately established, but there is not a direct calibration from the generic assumption to a scenario (see response to MMA comment regarding CSM). Though the commenter suggests that the screening level concentrations are extremely low with no real potential for concern, the DEQ has data that supports that human health effects occur from short-term exposures at low levels. Collected blood samples have confirmed not only exposure from low levels of hazardous substances, but impact to human health blood levels. The calculated values for the same hazardous substance in a single media are expected to be different for differing exposure pathways. Comparing criteria based on ingestion of drinking water with VIAP screening levels for groundwater based on the inhalation of vapors volatilizing from the groundwater is not appropriate. **Compounds below or near the target detection limits (TDLs):** The fundamental purpose of the generic criteria is to protect public health. The calculated value based on the equations and input values result in concentrations that are considered protective of public health. The only relevance for a TDL is if the analytical method is able to detect a hazardous substance in the media at that concentration. As stated above, the DEQ has data that supports the necessity of the screening levels as proposed in the rules. **Contradiction of the TAG 3 Recommendation:**	

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			assuming the "sump" is 0.96 m2, or approximately 44 inches in diameter. For perspective, the standard residential basement sump pit is 18 inches in diameter. This means the DEQ is assuming a pit surface area that is almost 6 times larger than is reasonable. The DEQ's assumption that the 44-inch diameter sump is uncovered is also unreasonable. Building codes typically require sump pits to be covered, to prevent people from accidentally stepping into them, and other objects from falling in which may damage the pump. The assumption of an open sump pit is particularly unreasonable for the pit size that the DEQ is assuming; a 44-inch diameter hole in the basement floor clearly would be a serious safety hazard to people and pets. Even if the DEQ can identify a residence with a larger than 18-inch sump it would not justify such a large deviation from the "typical" circumstances because generic criteria are intended to reflect the common range of circumstances and not the unique outliers. As such, the DEQ's revised scenario is still not a "reasonable and relevant exposure pathway" as required under 324.20120a(3). The attenuation factor (α) of 0.03 specified in Rule 27(3)(f)(ii) for diffusion of VOCs from groundwater in contact with the underside of the basement slab through the intact concrete slab is another unreasonable assumption. As discussed in the prior MMA comments on Rule 27(10)(d), this assumption is arbitrary, lacks scientific basis, was considered and unanimously rejected by TAG 3 members, and is almost 100 times higher (more stringent) than the value expected for vapor diffusion through intact concrete slabs that are not wetted continuously with groundwater. The latter fact was quantitatively demonstrated using benzene as an example, and the results were summarized in the table below. The above result quantitatively demonstrated the generally recognized fact that intact concrete, though porous, substantially impedes vapor migration relative to the foundation cracks normally assumed by USEPA and other state agencies in the derivation of generic vapor	Contrary to the assertions of the commenter, the proposed approach aligns with the TAG 3 recommendations, the USEPA, the neighboring states that default to USEPA values (Ohio, Indiana, Wisconsin and Minnesota) and Illinois for those sites that can document that groundwater is not shallow. The USEPA's VISL calculator specifically states that it cannot be used for those facilities where depths to the groundwater is less than 5 ft. below foundation level and assumes no direct contact between groundwater and building. Therefore, comparing USEPA's VISL calculated values to the VI Tier 1 screening values is not appropriate. The use of shallow groundwater in developing screening levels does not contradict with USEPA. The USEPA's 2015 OSWER Document states that "Wet basements in areas where groundwater is known to contain vapor-forming chemicals and the associated water table is shallow enough that the basements are prone to groundwater intrusion or flooding" indicates "a need for prompt action, including follow-up evaluations to determine whether urgent intervention is warranted to eliminate, avoid, reduce, or otherwise address a human health hazard." The TAG 3 recommendation only addresses those sites that have groundwater >3 m and assumes no direct contact between groundwater and building. In the CSA Report, TAG 3 discussions (Appendix C) reference the development of groundwater in contact criteria that includes the following: • Page 9 of TAG 3's Report states that the groundwater in contact analysis is beyond the scope of this document and therefore it was not included. • Page 20 of TAG 3's Report identifies three issues which require additional research, discussion, and decision by MDEQ, one of which	

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			intrusion criteria and screening levels. The following statement of this generally recognized fact is from USEPA's most authoritative guidance on vapor intrusion conceptual models: "The foundation floor and walls are treated as being impermeable barriers to the transport of vapors from the subsurface to the indoors, except where there are cracks or openings in the foundation. … Intact concrete is virtually impermeable to air flow; nevertheless, volatile compounds from soil gas may diffuse through a concrete slab at relatively low rates" (emphasis added) In the same USEPA guidance, the α for vapor migration through foundation cracks from a subslab source was demonstrated to be on the order of approximately 0.001, as illustrated in the graph below from the USEPA guidance. All of the above results, which were discussed in detail in the prior MMA comments, demonstrate that the α of 0.03 proposed in Rule 27(10)(d) is unreasonably high as a soil gas attenuation factor. Even more unreasonable is the DEQ's proposal to use the α of 0.03 in the revised GWIC scenario, because in this scenario VOC migration through the slab is further reduced by the higher moisture content in the concrete due to continuous wetting by the underlying groundwater. In the prior MMA comments, it was quantitatively demonstrated in an accompanying white paper by Ramboll Environ that the α for VOC migration through a wetted concrete slab is 3 x 10-5 for benzene (as an example). This means the α of 0.03 is 1,000 times too high (far more stringent than necessary to be protective). As noted in the prior MMA comments, the DEQ had provided no scientific basis to support the proposal to use the α of 0.03 in Rule 27(10)(d), which was considered and rejected by the TAG 3 members, including representatives of the DEQ. In proposing to use the same α in Rule 27(3)(f), the DEQ still has provided no scientific basis for its use in either rule. The arbitrary selection of 0.03 for use in Rule 27(3)(f) over	included: "developing groundwater criteria for sites where there may be intrusion of groundwater itself into the (existing or future) structure through direct contact with the structure, periodic flooding, or consistent presence in basement sumps." • Page 20 of TAG 3's Report states that the TAG had significant discussions, but did not have enough time within the current CSA process to sufficiently evaluate and make recommendations regarding the approach for groundwater in contact. **Assumptions utilized in the development of the groundwater in contact value:** The DEQ disagrees with commenter's assertion that the DEQ assumes that a 44-inch diameter sump is present. The 1 m^2 surface area represents a rounded value that includes the area of a sump (with a radius of 15 inches) and cracks in the floor and foundation walls (> 0.04 m^2). Generally, building codes may require a sump cover, but do not specify a vapor-tight cover or that the sump remain covered. Available information indicates 55% of the state has groundwater less than 5 feet below ground surface and 65% of the state has groundwater less than 10 feet below the ground surface, which is the depth used for a basement structure that has utilities and other features. A basement that has been constructed and extends below the groundwater surface elevation is likely to have a sump pump system that constantly operates that effectively replenishes the source of VOCs as groundwater migrates into the sump. This aligns with site information provided to the DEQ. Therefore, it is not arbitrary to conclude that contaminated groundwater would be in the sump and basement cracks. Though estimated engineering calculations for the diffusion through concrete were provided by MMA, the DEQ and multiple consultants have completed field demonstrations that support the diffusion	

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			the science-based results discussed above is a key factor in making the revised VIGWIC far more stringent than necessary to be protective. Using benzene as an example, the DEQ's revised VIGWIC of 1.1 ug/L is due almost entire to the assumption that vapor diffusion through wet, intact concrete is characterized by an α of 0.03. As discussed above, the reality is that the α for such diffusion is about 1,000 times lower, and the benzene VIGWIC should be about 1,000 ug/L for this vapor migration pathway alone (i.e., neglecting vapor emission from a sump). For the sump, reasonable assumptions would be that it is a standard 18-inch diameter sump with a typical cover that has a slot in the middle for piping and wiring to pass through (about 2 inches wide and 12 inches long) which reduces the pit opening by approximately 90%. With these assumptions and using this open area of the pit cover as AGWIC in Equation 2 of Rule 27(10)(b) to calculate the volatilization factor, the benzene VIGWIC would be almost 700 ug/L. This is in contrast with the DEQ's proposed benzene VIGWIC of 1.1 ug/L. The above results from using science-based methods and reasonable assumptions show that the VIGWIC for the DEQ's revised GWIC scenario are less stringent that the VIGW calculated per Rule 27(10)(a) for groundwater not in contact with a structure. This outcome is similar to that discussed in MMA's prior comments on the wetted slab scenario described in the DEQ's June support document, where proper evaluation of the scenario showed that the VIGWIC for that scenario is less stringent than the VIGW. Recommended Action The revised VIGWIC should be removed from the proposed rules, because they are based on inappropriate models and arbitrary exposure pathway assumptions which are not allowed to be used for derivation of Part 201 generic criteria (per 324.20120a(3)). As demonstrated above, properly calculated criteria for the DEQ's revised GWIC scenario, using sound science and judgment, would be less stringent (higher than) the VIGW. As such, these GWIC criteria are not necessary. With removal of the VIGWIC, the proposed rules should	coefficient used by the DEQ. **Rule 27(3) Attenuation factor (α) of 0.03 for shallow groundwater:** The DEQ disagrees with the commenter's assertions that this issue was considered and unanimously rejected by TAG 3 members and that the value is almost 100 times higher (more stringent) than the value expected for vapor diffusion through intact concrete slabs. The consideration of shallow groundwater criteria was not rejected by TAG 3 or in contradiction with the CSA recommendations. More information is provided above. The DEQ also disagrees that the commenter's assertion that the USEPA's guidance document is relevant to the discussion on shallow groundwater. The USEPA guidance does not address shallow groundwater. The scenario in the graph provided by the commenter actually depicts when the source area is 1m away from the structure which is more applicable to Rule 27(9)(c). The paper referenced by the commenter provided by Ramboll Environ that discusses a situation where the concrete is wetted is not applicable as the concrete is not wetted in the DEQ approach. For this reason, subsequent discussions that relate to this conclusion are also not relevant. The USEPA guidance states "In actual foundations, the ability of concrete to hinder the transport of soil gas depends on the physical integrity of the concrete and characteristics determined by cement mixtures, cement/water ratios, and production processes (e.g., poured concrete vs. concrete block)." **Rule 27(13)(d) and the use of 0.03 for vapor:** The DEQ disagrees with the commenter's assertions that the use of a steady-state attenuation coefficient of 0.03 for a vapor source is not appropriate nor is it supported by USEPA. In USEPA's 2015 Technical Guide for Assessing and	

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			be amended to indicate that the VIGW are to be used for only groundwater not in contact with a structure, and that a Tier 3 assessment is to be used for groundwater in contact with a structure. With these corrections, these aspects of the proposed rule would be consistent with CSA recommendation 3.1 and 3.2, and the standard practice of USEPA and the surrounding states.	Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air the attenuation factor for residential buildings is 0.03 for sub-slab soil gas and "near-source" exterior soil gas. This document is available at: https://www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf This approach aligns with the USEPA, the neighboring states that default to USEPA values (Ohio, Indiana, Wisconsin and Minnesota) and Illinois. Furthermore, the use of 0.03 is supported by the USEPAs database that was developed by USEPA's Vapor Intrusion Workgroup (2003–2010) for OSWER, with Dr. Helen Dawson of OSWER's Office of Superfund Remediation and Technology Innovation as the primary investigator and author. This document has undergone extensive internal Agency review, including Regional review and review by other USEPA programs, as well as review by members of an expert panel that provided support to OSWER. Additionally, the report has been subjected to USEPA's formal external peer-review process. That document is available at: https://www.epa.gov/sites/production/files/2015-09/documents/oswer_2010_database_report_03-16-2012_final_witherratum_508.pdf	
		ARCADIS	*9-13-2016*: The Tier 1 groundwater criteria are based on the assumption that groundwater is in contact with the foundation of the building. DEQ calculates constituent-specific volatilization factors (VFs) based on the Henry's law constant, the air exchange rate, the volume of the room (basement), the surface area of contaminated water within the structure, and a mass-transfer coefficient. The default surface area of impacted groundwater used in the generic Tier 1 values is 100 square meters (m^2), or 1,076 square feet (ft^2). This assumes that a residential basement is constantly flooded and that impacted water is covering the entire basement floor. This is a highly unlikely scenario. A more likely scenario for properties where impacted groundwater is in contact with the foundation is that the groundwater is gathering in a sump and is being pumped out by a sump pump. A typical sump is between 18 and 24 inches across, with a typical opening area of approximately 3.1 square feet (for a 24-inch diameter sump). Arcadis recommends that the basis for the Tier 1 groundwater values for vapor intrusion be revisited and revised. *10-18-2016:* The AAVs for residential and non-residential scenarios are not presented in the draft Rules making the calculation of Tier 2, 3A, and 3B values difficult. Arcadis recommends that the residential and non-residential AAVs be presented in order to make the vapor intrusion criteria and screening levels more transparent. Arcadis recognizes that the Tier 1 groundwater screening levels were revised. However, there are still some issues with the revised criteria. • R 299.27(3)(e): Constituents designated as a single event developmental hazard should not be treated		

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			differently than other volatile hazardous substances in regards to the areas available for volatilization of hazardous substances because there are situations where groundwater will not contact the foundation. • R 299.27(3)(f)(i) states that the area of direct diffusion is represented by 1 square meter (m2). However, the default area stated in the equation in R 299.27(10)(b) is still 100 m2. This should be updated to be 1 m2. In addition, the referenced location of this equation in R 299.27(3)(f)(i) (on page 71) is incorrect. It is referenced as R 299.10(b), but should be R 299.27(10)(b). These inconsistencies should be addressed before the rule is finalized. • R 299.27(3)(f)(ii) indicates that the diffusion of a volatile hazardous substance across the concrete floor has an attenuation factor (α) of 0.03. It does not appear that this value is calculated using the equations provided in R 299.27(10)(a), but rather, is a default number. Assuming this is the case, the source of the default attenuation factor should be referenced in the rule. • R 299.27(3)(f) and the associated equations do not show how the different vapor source types (direct diffusion vs diffusion across the concrete floor) are weighted or accounted for to come up with the final Tier 1 screening level for groundwater. These equations should be provided and the process made transparent so that the Tier 1 screening levels for groundwater can be verified and modified to be site-specific (e.g., to account for a different direct diffusion area). • Based on the changes to the source area for direct diffusion and the inclusion of the diffusion across the concrete floor, all of the health-based Tier 1 groundwater values in Table 4 (VI Tier 1 Groundwater, Soil and Vapor Screening Levels) should have been revised. However, many have not been revised. Please provide clarification as to how the criteria were derived.		
27	4	MMA	Proposed deletion of subrule. This section is no longer applicable subsequent to	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario.	None

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			removing the groundwater in contact screening level equations (and actually, the provision did not make sense considering that no VIAC can be developed if a volatile hazardous substance doesn't have a toxicological value or chemical-physical values.	This provision is now Rule 27(7). The equations for shallow groundwater [Rule 27(13)(a)] and for groundwater that is not shallow [Rule 27(13)(b)] rely on different chemical-physical values. Therefore, you may have sufficient information to calculate for one or the other scenario.	
27	(5)(a)(i)	MMA	Modified subrule language provided to revise for groundwater NOT in contact.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario. This provision is now included in Rule 27(8)(a)(i) revised for shallow groundwater.	Rule 27(8)(a)
27	(6)	MMA	Modified subrule language provided to add "volatile."	See response to comments for Rule 2(k)- definition of volatile.	None
27	(6)(b)	MMA	Modified subrule language provided to revise for groundwater NOT in contact.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario. This provision is now included in Rule 27(9)(a) and (b) revised as shallow groundwater.	Rule 27(9)(a) Rule 27(9)(b)
27	(6)(b)	HALEY	Tier 2 default assumptions for depth of residential basements is overly conservative and unrealistic. R 299.27(6)(b), regarding Tier 2 values, states "The generic input value for the depth to groundwater is 3 meters and is assumed to be in contact with the structure. A depth to groundwater greater than 3 meters can be established using the shallowest depth of the first encountered groundwater considering seasonal variations based on data specific to the facility and DEQ approved methodology." However, Table 1 as cited in the regulation stipulates a groundwater to indoor attenuation factor of 0.03 for Tier 2 'groundwater in contact' criteria and 'to be calculated' for groundwater not in contact. It is unclear why the Tier 2 value would assume that groundwater is in contact with a residential basement floor slab that is 3 meters below the ground surface, which does not reflect typical construction in Michigan for residential basements. It is also not clear why the Tier 2 'in contact' attenuation factor would be different than the Tier 1 attenuation factor. Proposed modification to proposed DEQ change: Adopt	The DEQ disagrees with the commenter's assertions; however, this subrule was modified on 9-29-2016. Refer to the DEQ's response to comments regarding Rule 27(3)(f) The USEPA's VISL calculator specifically states that it cannot be used for those facilities where depths to the groundwater is less than 5 ft. below foundation level (3.5 m below ground level) and assumes no direct contact between groundwater and building. Michigan-specific data demonstrates that groundwater in contact with a structure is a reasonable and relevant exposure pathway consistent with statute. This data also documents that the majority of the state can be expected to have shallow groundwater less than the depth of a basement (3 meters). Therefore, accepting the commenter's suggested approach, not only precludes the use of the generic cleanup criteria for a majority of the sites throughout the state	No further rule revision is required.

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			assumptions made by USEPA to evaluate the conceptual model for determining risk based values.	including sites in most of the highest populated areas, it requires that a majority of the sites complete a site-specific evaluation. This would prevent self-implementation and result in unnecessary added costs to the party proposing response activity. The depth below grade (L_F) of the residential basement is 2 meters as identified in Rule 27(16), Table 1. The depth of footing and utilities below the enclosed space (L_{FF}) is an additional 1 meter. This represents 3 meters below grade, the same depth that's been used since 1998.	
27	(6)(e)	MMA	Proposed deletion of subrule.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario. This provision is now included as Rule 27(9)(e) revised as shallow groundwater.	Rule 27(9)(e)
27	8(c)	GES	Will the DEQ proposed VI model incorporate bioattenuation for petroleum contamination sites? Or will these considerations need to be confined to Tier III assessments only?	A VI Tier 3B evaluation will allow the use of a model that incorporates bioattenuation, such as Biovapor. To use such models, site-specific information is required to generate a value that appropriately evaluates the potential for risk at a site. Consistent with the ITRC petroleum vapor intrusion guidance, the use of a petroleum model requires site-specific information to evaluate the potential for vapor intrusion.	None
27	(8)(c)(iv)	MMA	Modified subrule language provided for finite vapor source methods.	VIAP is a relevant pathway for current and reasonably anticipated potential activities. See response to comment for Rule 2(h)- relevant pathway definition. The proposed revision is unnecessary given the definition of "facility" and "lateral inclusion zone.	None
27	(10)	MMA	Modified subrule language provided to revise equation header.	The header for the equation for what is now Rule 27(13)(a)(1) was modified 9-29-2016.	No further rule revision is required.
27	(10)(b)	MMA	Subrule proposed to be deleted.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater scenario. The equations are now Rule 27(13)(b)	Rule 27(13)(b)

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27	(10)(b)	MMA	The groundwater vapor intrusion values based on pathway entitled "groundwater in contact with a structure" (VIGWIC) in R 299.27(10)(b) are not legitimate vapor intrusion screening levels or criteria. The proposed values are not as implied by the title in the rule but are actually "water intrusion" criteria that are based on the novel scenario in which a residential basement is flooded by groundwater flowing through it for 32 years. MMA members thought that a simple mathematical modelling mistake was made based on the title of the exposure in the proposed rules and so questioned the DEQ about this scenario and what was meant by it. Their response was that they were truly trying to model a basement continuously flooded and replenished by contaminated water for 32 years. If this scenario is not odd enough, this response raises further questions, such as why the DEQ assumed that a resident would live in that flooded basement 24/7 for 32 years, or why the DEQ did not think to derive water ingestion and dermal contact criteria for this scenario to protect that resident. In any case, this scenario is an inappropriate basis for the derivation of generic Part 201 screening levels or criteria because: (1) it defies common sense; (2) it does not represent a "reasonable and relevant exposure pathway" as required under 324.20120a(3); (3) it contradicts the recommendations of TAG 3 to derive groundwater vapor intrusion criteria based on groundwater not in contact with a structure; (4) it contradicts CSA's recommendation for MDEQ to adopt the recommendations of TAG 3; (5) it defies MDEQ's July 2015 support of CSA's recommendation; (6) it is at odds with the standard practice of USEPA and surrounding states to use a vapor intrusion scenario instead of a "water intrusion" scenario for derivation of generic vapor intrusion criteria; (7) it is at odds with the scenario described in the June MDEQ technical support document as the basis of the VIGWIC; and (8) it results in criteria that fall far short of the Part 201 criteria re-evaluation goal to ensure proper calibration of the generic criteria to identify sites with a real potential for concern and to	The pathway identified in the proposed rules is the Volatilization to indoor air pathway ("VIAP"). For groundwater, it addresses both were the direct volatilization to indoor air may occur (shallow groundwater) or where vapor intrusion may occur. It is not at odds with the EPA's approach nor does it contradict the CSA recommendations. Based on comments received the approach has been modified to reflect that shallow groundwater is located within the zone where the direct diffusion into the indoor air is likely to occur. The depth to groundwater in this conceptual site model is located beneath the concrete floor and foundations at a depth were diffusion through the soil and into the structure is not appropriate to be modeled with the Johnson and Ettinger Model. Shallow groundwater is a reasonable and relevant exposure pathway in Michigan. The exposure assumptions for this scenario were revised on 9-29-2016. See response to comments for Rule 27(3)(f).	None

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			exclude sites with minimal risks. Recommended Action: The proposed VIGWIC should be removed from the proposed rules, because they are not legitimate Part 201 generic vapor intrusion criteria. This would be true if they were intentionally calculated for a flooded basement scenario as the proposed rules indicate, and it would be true if this criteria were meant for MDEQ's implied scenario of a wetted concrete slab from groundwater continuously in contact with it. With removal of the VIGWIC, the proposed rules should be amended to indicate that the VIGW are to be used for only groundwater not in contact with a structure, and that a Tier 3 assessment is to be used for groundwater in contact with a structure. With these corrections, these aspects of the proposed rule would be consistent with CSA recommendation 3.1 and 3.2, and the standard practice of USEPA and the surrounding states. See Appendix 4 and Appendix 6 for further comments.		
27	(10)(b)	KAYLOR	Equation 2. "Volatilization" is misspelled	This correction was made 9-29-2016.	No further revision is necessary
27	10(c) (4) & (6)	AMECFW	Soil concentrations should not be used to assess vapor intrusion risks. Including soil screening levels/criteria may result in unnecessary expense.	This concern was evaluated as part of the CSA. It was determined that generic soil screening levels should be included. (TAG 3 Report).	None
27	10(d)	MMA	Proposed vapor migration rate through intact concrete floor // Appendix 5	See response to comments for Rule 27(3)(f).	None
			The proposed soil gas attenuation coefficient (α) of 0.03 for vapor sources within 1 meter of a structure is arbitrary, lacking scientific basis, and about 10 times more stringent than values in the most authoritative USEPA guidance manual on vapor intrusion. The use of this arbitrary value instead of calculating the attenuation coefficient pursuant to equations in the proposed rules also contradicts recommendations of TAG 3, which were endorsed by the CSA and supported by department. The department has given no data or other basis for deviating from these recommendations or the results of USEPA's most rigorous analysis of this scenario (where a source is within 1 m of a building).		

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			DEQ's proposal to use the much more stringent attenuation factor of 0.03 for calculating soil gas criteria, but not for calculating groundwater or soil criteria, also violates the fundamental principle that the attenuation factor for a given conceptual model is not dependent on whether vapor is from groundwater, NAPL, soil, or a "vapor cloud" (defined in proposed Rule 27 (1)(f)). By violating this principle, MDEQ is in effect claiming that vapor from a given soil or groundwater source has at least 10 times more vapor intrusion potential when evaluated using soil gas data as compare to an evaluation using either soil or groundwater data for that given source. This "penalty" for using soil gas data is arbitrary, lacking scientific basis, and guarantees confusion in a multiple line of evidence vapor intrusion assessment that uses both soil gas and soil or groundwater data. Recommended Action: The proposed soil gas α of 0.03 should be removed from the proposed rules, because it is arbitrary, lacking scientific basis, and is at least 10 times higher than appropriate, regardless of whether vapor is assumed to enter through intact concrete or via cracks, or if a vapor source is within 1 m of a building. By removing the attenuation factor of 0.03 as a default, the soil gas attenuation factor would be calculated by the proposed rules in all cases, which would be consistent with CSA recommendation 3.1 and 3.2, and would result in the use of attenuation factor values that are consistent with those in USEPA's most authoritative reference manual on vapor intrusion conceptual models. See Appendix 5 for additional comments		
27	(11)	MMA	Modified subrule language provided to revise equations for exposure time.	See response to comments for Rule 26 & 27 regarding exposure time.	None
27	(13) Table 1	MMA	Air exchange rate inputs to vapor intrusion values. Correct the default Tier 3A air exchange rate for "manufacturing" facilities.	This was further discussed as part of the Phase II Stakeholder Process. The air exchange rates have been modified in Rule 27(16) Table 1 to reflect the size of a nonresidential structure or portion of a structure.	Rule 27(16) Table 1
27	(13) Table 1	MMA	Modified subrule language provided to revise for groundwater NOT in contact.	The DEQ does not agree with the commenter's suggestion to remove the shallow groundwater	Rule 27(16) Table 1

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				scenario. The generic inputs are now Rule 27(16) Table 1 and have been revised for shallow groundwater.	
27	(13) Table 1	BARR	LT : Soil and Vapor: 1 cm or 0.01m; Groundwater: Assumed to be in contact with the structure Building Type: Soil: Residential house with slab-on-grade foundation; Groundwater and Vapor: Residential house with occupied basement Foundation Type: Soil: slab-on-grade; Groundwater and Vapor: Basement 9-13-2016: The soil, groundwater, and vapor conditions listed cannot occur at the same place and time; VI Tier 1 values appear to incorporate compounded conservatism. Based on the values in Table 1 it is not currently possible that a person implementing a response activity can confirm that the expected activity patterns at a facility are consistent with the exposure assumptions used by the DEQ to calculate the applicable generic cleanup criteria because of the conflicting assumptions in Rule 27 Table 1. 10-18-2016: Comment resubmitted	A modification to the mixing height was identified as being necessary from another commenter. This resulted in there no longer being a difference for the residential structure foundation assumption. The language of Rule 27(2) was revised to clarify that the location of the media sample is aligned with the location of the vapor source within the lateral inclusion zone. Figures and examples to illustrate the rule provision will be provided in the DEQ Criteria Resource Materials. The DEQ removed Rule 4(7) on 9-29-2016.	Rule 27(16) Table 1 Rule 27(2)
27	(13) Table 1	CONSUMERS	LT : Soil and Vapor: 1 cm or 0.01m; Groundwater: Assumed to be in contact with the structure Building Type: Soil: Residential house with slab-on-grade foundation; Groundwater and Vapor: Residential house with occupied basement Foundation Type: Soil: slab-on-grade; Groundwater and Vapor: Basement 9-13-2016: The soil, groundwater, and vapor conditions listed cannot occur at the same place and time; VI Tier 1 values appear to incorporate compounded conservatism. This is clear contradiction with Rule 4(7) that requires confirmation that activities at a facility are consistent with exposure assumptions. 10-18-2016: Comment resubmitted		

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30		SONS	I notice that the rules do not acknowledge the obvious fact that sediment is an environmental media. I can find no cleanup criteria for sediment, nor any criteria for establishing a location with contaminated sediment as a "facility", nor any rules regarding what should happen when contaminated sediment is encountered in the absence of related Part 201 "facility". Rule 30 mentions that any response activity plan that addresses surface water or sediments must include site-specific cleanup criteria, but there are no requirements to address contaminated sediment that are not related to a response activity plan. It is unclear to me who in DEQ owns responsibility for contaminated surface water sediments, but the part 201 rules seem to be the logical place for them.	The Part 201 rules address criteria for sediments when that medium is part of the nature and extent of contamination of a Part 201 facility (i.e., addressed in a response activity plan). By definition a "facility" is based solely on exceedance of generic unrestricted residential criteria; not site-specific criteria. Sediment toxicity is driven by site-specific conditions and is not suitable for generic criteria assumptions. Addressing sediments not otherwise related to a Part 201 facility is not authorized by Part 201, and not applicable to the scope of this rule package.	None
30	(1)	BARR	*9-13-2016*: How does this rule interact with Part 31 with regards to surface water? Based on the way it is worded site-specific criteria needs to be developed when it may be more appropriate to use Part 31 number for the initial screening values. *10-18-2016*: Comment resubmitted	DEQ has reviewed the need for "surface water" site-specific criteria and concurs that it can be addressed consistent with Part 31. References to surface water were removed from this subrule.	Rule 30(1)
30	(1)	BARR CONSUMERS	*9-13-2016*: Add a reference or definition for waters of the state. *10-18-2016*: Comment resubmitted	This subrule has been modified in response to this comment	Rule 30(1)
30	(1)	BARR CONSUMERS	*9-13-2016*: The change of the criteria being developed by the DEQ to being approved by the DEQ is a major policy shift. It will increase response activity costs. By changing the word "shall" to "should" or "may" would minimize the increased cost. *10-18-2016*: Comment resubmitted	Approval by the DEQ is consistent with the statutory provisions regarding site-specific criteria; the statutory provisions do not require that the DEQ establish site-specific criteria. When necessary to assess the potential risk to public health, safety and welfare and the environment from sediment contamination that is part of the nature and extent of a release, the need for site-specific sediment criteria to be established requires "shall" not "may" or "should". The provisions of the rule are not inconsistent with the statutory options to address all or a portion of the facility. The rule provides that when such sediment contamination is addressed in a response activity plan, site-specific criteria must be established.	None

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30	(1)	MMA	Need to specify that sediment cleanup criteria can be non-numeric	MCL 324.20120a(1) and 20120b address the issue raised by the commenters. To provide clarity this subrule was modified to include these references.	Rule 30(1)
		BARR	*9-13-2016:* The rule should be updated to allow for both presumptive remedies and non-numerical values. *10-18-2016*: Comment resubmitted		
		CONSUMERS	*9-13-2016*: Based on the changes, the rule reads that presumptive remedies and use of non-numeric values are no longer allowed. The rule should be updated to allow for both presumptive remedies and non-numerical values. *10-18-2016*: Comment resubmitted		
30	(2)	BARR	*9-13-2016*: Eliminate this subrule or limit it to only information submitted to the DEQ by the party developing the criteria. *10-18-2016*: Comment resubmitted	This subrule was modified in response to this comment.	Rule 30(2)
30	(2)	CONSUMERS	*9-13-2016*: The change to this rule could be very broadly interpreted and become a burden to the party developing the criteria. This rule should be limited to only information submitted to the DEQ by the party developing the criteria. *10-18-2016*: Comment resubmitted		
34		GLELC	1. <u>DEQ should expressly address environmental justice issues through this rulemaking.</u> Environmental justice communities suffer from a variety of non-chemical stressors, from multiple stressors that affect them in the same time period, and from pre-existing stressors based on legacy pollution. It is well documented that exposure to a multitude of stressors such as chemical, biological, physical, and psychological stressors can negatively affect human health outcomes. It is also well documented that exposure to multiple chemical stressors that may have synergistic or other combined effects may lead to especially bad health outcomes. Areas that suffer the most from multiple-stressors multiple-effects are environmental justice areas. DEQ should better account for these circumstances in developing its cleanup criteria because accounting for them provides the most accurate possible understanding of exposure and risk on which the criteria are based. The October 2014 final report by the Technical Advisory	The DEQ will continue to evaluate the feasibility and appropriateness of using cumulative risk. If the DEQ determines that it is appropriate, the DEQ will pursue a future revision of the cleanup criteria rules to accomplish this change.	None

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			Group addresses this issue and references multiple sources for the now uncontroversial notion that certain populations, particularly minority and low income populations, already suffer from a variety of stressors and effects. Cleanup criteria need to be based on accurate risk assessment, and for risk assessment to be accurate, it cannot ignore the increased risk of especially vulnerable environmental justice communities. Cumulative risk assessment and methodologies for incorporating such assessment into health policy and rulemaking already exist. The Proposed Rules do address the concepts of multiple-stressors and multiple-effects, but do so incompletely and ineffectively. Proposed Rule 34(1) states in part: If 2 or more hazardous substances are present and known to result in toxicological interaction, then the interactive effects, including additivity, shall the considered in establishing levels that are protective of the public health, safety, and welfare and the environment. Proposed Rule 34(2)(a) authorizes the DEQ to develop generic criteria where: A hazardous substance causes an adverse effect in a sensitive lifestage or subpopulation that is not adequately protected by a generic criterion or represented by any of the generic exposure assumptions. Adverse effects to be addressed by this subrule include, but are not limited to, developmental or reproductive effects. Proposed Rule 34(1) authorizes DEQ to consider the notion of synergistic and other combined effects. Proposed Rule 34(2)(a) authorizes DEQ to consider especially vulnerable subpopulations without expressly mentioning environmental justice communities. While it is good to have these updated rules, it is not enough. Because DEQ did not already develop generic criteria in the Proposed Rules to specifically address environmental justice, DEQ might only be able to utilize those rules for an environmental justice purpose through its site-specific criteria-setting authority. For all intents and purposes, that will often if not always place the burden on the public to identify opportunities for DEQ to exercise its authority		

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			in this way and to explain how it should do so through formal public comment and other forms of engagement. When it comes to solutions to environmental justice problems, it is unfair to place the full burden to develop solutions on the communities suffering through no fault of their own from the problem, particularly where cumulative assessment tools already exist. Using the authority already provided by these above-referenced rules, DEQ at the very least needs to write into the Proposed Rules a strategy to actually incorporate cumulative risk assessment into the next round of generic criteria development so that they become the norm instead of an exception to the norm.		
34	(1)	MMA	In at least four rules, the DEQ adopts the use of TEFs: rules 299.34(1)(a) and 299.49(1)(O) for dioxin and "dioxin-like" compounds, including PCBs; rule 299.34(1)(b) for carcinogenic polynuclear aromatic hydrocarbons; and rule 299.4(11) for any other "isomers of hazardous substances" that DEQ identifies. When developing and applying TEFs, uncertainty can arise for many reasons, including problems extrapolating from animal studies to humans, determining whether different compounds behave similarly in the human body for all effects, and differences in the half-life of compounds (and, accordingly, body burden). Further, TEFs are generally developed based on one particular type of exposure (e.g., food intake) and often are not suitable for use with other exposure pathways (e.g., dermal contact), resulting in the use of TEFs for one type of exposure at a site, but not for others. Finally, there appears to be little limitation or guidance in the proposed rules. For example, all compounds with "documented dioxin-like activity" and TEFs or "other relative potency factors recognized by [the USEPA]" are included in the dioxin rule, without explaining what some of these crucial terms mean. ("Documented" by whom? "Dioxin-like" in what way? "Recognized by USEPA" how?) In the end, this is a complex and burdensome requirement with doubtful or minimal benefit.	The DEQ does not concur with the recommendation to retain the language from the existing subrule (1). The toxic equivalency factor (TEF) approach for the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (dl-PCBs) proposed in these rules has wide acceptance across the globe, the National Academy of the Sciences supports the approach, and the USEPA recommends the approach and the TEFs. The dioxin-like toxicity of coplanar PCBs and additivity with the PCDDs and PCDFs has been well documented, recognized in the scientific community since the early 1990s (Ahlborg et al, 1994; Barnes et al, 1991), and widely accepted with the publication of the 1998 WHO consensus TEFs (van den Berg et al , 1998). The support for the additivity including dl-PCBs was reevaluated in 2005 (van den Berg et al, 2006, Walker et al, 2005). The proposal to separately evaluate some of these hazardous substances is not consistent with best available science and would not adequately protect public health when mixtures of these contaminants are present at a site. The DEQ does expect there will be some sites where only PCDDs and PCDFs are present, some sites where only dl-PCBs are present, and some sites where PCDDs, PCDFs, and dl-PCBs	None

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			Recommended Action: The TEF concept should remain limited to dibenzodioxins and dibenzofurans as set forth in the current rules. These compounds arguably have the most developed, studied, and agreed upon TEFs (but are not themselves without controversy). Proposed deletion of subule, retaining language from current subrule (1). See also comments for Rule 49(1)(O)	are present from releases at that site. A site-specific evaluation for these conditions is appropriate. These chemicals are always found in mixtures, not as single chemicals, so the use of ½ the detection limit is appropriate, consistent with addressing nondetects in other assessments of mixtures, and another approach can be proposed such as that found at https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites. See also response to comments for Rule 4(11) regarding isomers and Rule 49(1)(Q) regarding carcinogenic PAHs.	
34	1(a) 1(b)	CONSUMERS	*10-18-2016*: These sections need to be updated to match the changes made in the footnotes.	The DEQ concurs that "and polybrominated" should be removed from Rule 34(1)(a) at this time. The inclusion of the polybrominated dibenzo-p-dioxins and dibenzofurans (PBDDs/Fs) in the April 27, 2016 proposed rules was continued as they were included in the 2002 and 2013 rules. Although these hazardous substances have demonstrated similar aryl hydrocarbon receptor mediate dioxin-like toxicity and order of magnitude relative potency (van den Berg et al, 2013), the DEQ concurs that there currently are not toxic equivalency factors (TEFs) for the PBDDs/Fs that are recommended by the USEPA (USEPA, 2010) or the World Health Organization (WHO). The DEQ will remove these from Rule 34(1)(a), Rule 49(1)(O) and will delete footnote (O) from the 2,3,7,8-tetrabrominated dibenzo-p-dioxin listing in the tables in Rules 46 and 50. PBDDs/Fs will need to be assessed on a site-specific basis subject to MCL 324.20120b when identified in environmental media.	Rule 34(1)(a) Rule 49(1)(O)
34	(1)(a) & 49(1)(O); (1)(b) &49	CHAMBER	Combining chemical classes such as dioxins and PCBs, which have very different toxicity, differing physical chemistry and different sources, is not productive or reasonable as part of the generic criteria. Such an approach will result in needless confusion and does not	The DEQ does not concur with the recommendation that dioxin toxic equivalency factors (TEFs) should be limited to dioxins and furans. The proposal to separately evaluate some of these hazardous substances is not consistent with best available	None

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	(1)(Q); Rule 46: Table 2 Table 3		offer increased protection of public health. PBBs do not have toxicity values or toxicity equivalency factors (TEFs) accepted by USEPA and as such should not be included in any analysis on this basis. Remove references to and use of TEFs for PCBs, PBBs and "specific isomers" that DEQ may identify. Dioxin TEFs should be limited to dioxins and furans.	science and would not adequately protect public health when mixtures of these contaminants are present at a site. The toxic equivalency factor (TEF) approach for the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (dl-PCBs) proposed in these rules has wide acceptance across the globe, the National Academy of the Sciences supports the approach, and the USEPA recommends the approach and the TEFs. The dioxin-like toxicity of coplanar PCBs and additivity with the PCDDs and PCDFs has been well documented, recognized in the scientific community since the early 1990s (Ahlborg et al, 1994; Barnes et al, 1991), and widely accepted with the publication of the 1998 WHO consensus TEFs (van den Berg et al , 1998). The support for the additivity including dl-PCBs was reevaluated in 2005 (van den Berg et al, 2006; Walker et al, 2005). The DEQ does expect there will be some sites where only PCDDs and PCDFs are present, some sites where only dl-PCBs are present, and some sites where PCDDs, PCDFs, and dl-PCBs are present from releases at that site. A site-specific evaluation for these conditions is appropriate. The proposed rules do not include polybrominated biphenyls (PBBs) in the Rule 34(1)(a), Rule 49(1)(O), or do they include reference to TEFs or TEQ estimates (e.g., footnote (O)) in Rule 50, Tables 1 & 3. The commenter may be confusing PBBs with polybrominated dibenzo-p-dioxins and dibenzofurans (PBDDs/Fs). The inclusion of the polybrominated dibenzo-p-dioxins and dibenzofurans (PBDDs/Fs) in the April 27, 2016 proposed rules was continued as they were included in the 2002 and 2013 rules. Although these hazardous substances have demonstrated similar aryl hydrocarbon receptor	

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				mediate dioxin-like toxicity and order of magnitude relative potency (van den Berg et al, 2013), the DEQ concurs that there currently are not toxic equivalency factors (TEFs) for the PBDDs/Fs that are recommended by the USEPA (USEPA, 2010) or the World Health Organization (WHO). The DEQ will remove these from Rule 34(1)(a), Rule 49(1)(O) and will delete footnote (O) from the 2,3,7,8-tetrabrominated dibenzo-p-dioxin listing in the tables in Rules 46 and 50. PBDDs/Fs will need to be assessed on a site-specific basis subject to MCL 324.20120b when identified in environmental media.	
		CONSUMERS	*9-13-2016*: In at least four rules, the DEQ adopts the use of TEFs: rules 299.34(1)(a) and 299.49(1)(O) for dioxin and "dioxin-like" compounds, including PCBs; rule 299.34(1)(b) for carcinogenic polynuclear aromatic hydrocarbons; rule 299.4(11) for any other "isomers of hazardous substances" that DEQ identifies; and criteria table footnotes O and Q. The use of TEFs leads to uncertainty due to issues extrapolating from animal studies to humans, determining whether different compounds behave similarly in the human body for all effects, and differences in the half-life of compounds (and, accordingly, body burden). Further, TEFs are generally developed based on one particular type of exposure (e.g., food intake) and often are not suitable for use with other exposure pathways (e.g., dermal contact), resulting in the use of TEFs for one type of exposure at a site, but not for others. Lastly, the proposed rules provide little limitation or guidance on the use. For example, all compounds with "documented dioxin-like activity" and TEFs or "other relative potency factors recognized by [the USEPA]" are included in the dioxin rule, without explaining what some of these crucial terms mean. ("Documented" by whom? "Dioxin-like" in what way? "Recognized by USEPA" how?) We suggest that the DEQ limit the TEF concept to dibenzodioxins and dibenzofurans as set forth in the	The toxic equivalency factor (TEF) approach for the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (dl-PCBs) proposed in these rules has wide acceptance across the globe, the National Academy of the Sciences supports the approach, and the USEPA recommends the approach and the TEFs. The dioxin-like toxicity of coplanar PCBs and additivity with the PCDDs and PCDFs has been well documented, recognized in the scientific community since the early 1990s (Ahlborg et al, 1994; Barnes et al, 1991), and widely accepted with the publication of the 1998 WHO consensus TEFs (van den Berg et al , 1998). The support for the additivity including dl-PCBs was reevaluated in 2005 (van den Berg et al, 2006; Walker et al, 2005). Excluding dl-PCBs from the total TEQ is not consistent with best available science would not adequately protect public health when mixtures of these contaminants including dl-PCBs are present at a site. The DEQ does expect there will be some sites where only PCDDs and PCDFs are present, some sites where only dl-PCBs are present, and some sites where PCDDs, PCDFs, and dl-PCBs are present from releases at that site. A site-specific evaluation for these conditions is	None

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			current rules. These compounds have the most developed, studied, and agreed upon TEFs although they are still somewhat controversial. Also, the DEQ has stipulated that half of the detection limit shall be used in cases of non-detect values for the TEF calculations. This is an unnecessary extra layer of conservatism in a calculation process that is already conservative. *10-19-2016*: Comment resubmitted	appropriate. The TEFs proposed have both documented dioxin-like activity **and** have TEFs recognized or recommended by the USEPA. The PBDDs and PBDFs were removed from the proposed rules because they did not meet both of these requirements. These chemicals are always found in mixtures, not as single chemicals, so the use of ½ the detection limit is appropriate, consistent with addressing non-detects in other assessments of mixtures, and another approach can be proposed such as that found at https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites. See response to comments for Rule4(11) regarding isomers.	
34	(2)	MMA	As part of these proposed rules the DEQ has created new generic criteria that DEQ believes are necessary to be protective of adverse developmental or reproductive effects which are assumed to occur following shorter term exposure. The proposed classification of these chemicals appears subjective, opaque, and often ignores IRIS determinations. As well, the process to calculate generic cleanup criteria based on these short term exposures is novel and was not peer reviewed or vetted by outside practitioners prior to this proposal. The development of these short term exposure scenarios, in the selection of chemicals, in the construction of this short term exposure, and in the implementation of the calculations, is contrary to both the CSA Guiding Principles to use the best available science and specific recommendations which strongly encourages peer review of the process and use of standard methodologies. See Appendix 6 for further comments.	The DEQ has followed the CSA Recommendations as follows: From the CSA final report guiding principles: "The generic cleanup criteria need to be protective of public health and natural resources such that there are no unacceptable exposures to hazardous substances. Generic criteria are to be protective of the most sensitive toxic effect in a given exposure pathway for the hazardous substance in question." To protect for developmental and/or reproductive toxicity when it is the most sensitive toxic effect, the CSA made the following recommendations: 2.1: Receptor: Use an age-adjusted child plus adult receptor that, at present, assumes exposure across two age bins, except in the case of developmental toxicants. 2.2: Guidance: Use USEPA information to develop a process to account for those chemicals, or classes of chemicals, that have documented developmental	None

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				or reproductive effects. 2.3: Descriptive Language: Use current Part 201 rules (R299.49 (DD)) that allows the agency to regulate developmental and reproductive toxicants to protect sensitive subpopulations from these substances on a chemical-specific basis. For developmental and reproductive toxicants, the MDEQ should evaluate if the age-adjusted child plus adult receptor is protective of childhood and early-life-stage exposures on a chemical-specific basis. The CSA recommended that DEQ use an age-adjusted receptor for residential land use, although USEPA and many other states use a child only receptor for residential land use. In addition, the CSA recommended that the DEQ develop a process to evaluate if the age-adjusted receptor was adequately protective for developmental and reproductive toxicity. The DEQ developed a process to do that by comparing calculated values for each exposure pathway for both an age-adjusted receptor, child only receptor and pregnant female receptor for hazardous substances with developmental toxicity as the basis for the best available noncancer toxicity value per the CSA recommendation. USEPA CERCLA and RCRA programs do not have a specific process to address developmental toxicity since these programs use a child receptor for residential screening levels for all chemicals. The TSG Children's Environmental Health subcommittee evaluated USEPA guidance related to developmental toxicity and early life exposures. It was found that TSCA was using an approach for recent risk assessments (TCE, 2014 and n-methylpyrrolidone, 2015) that address developmental toxicity and the DEQ process adopted the TSCA approach. Briefly, the DEQ process was 1) toxicity values (oral	

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				reference dose and inhalation reference concentrations) for each hazardous substance were reviewed and selected for best available science. 2) Once the best available toxicity values were selected for the hazardous substances, the basis of the noncancer toxicity values were evaluated to determine if they were based on a developmental toxicity endpoint (from exposure during early life). Only those hazardous substances with a developmental based toxicity were included for the child or pregnant woman exposure scenarios. 3) Developmental toxicity endpoints from prenatal exposures were identified for single event (mortality, structural or functional abnormalities) or full-term (only altered growth) exposure scenario for the pregnant female receptor. 4) The calculations were done for each toxicity endpoint (cancer, noncancer), and receptor to determine the health-based value for each hazardous substance, exposure pathway, environmental medium, and land use. The minimum of the calculated values for each pathway and medium become the criterion for the hazardous substance. The only difference with the criteria calculation for hazardous substances that have a noncancer toxicity value is that those based on a developmental endpoint also include both a child and pregnant woman receptor for residential and a pregnant woman receptor for nonresidential to determine which is the most protective of public health. In many cases, cancer risk or other values (e.g., state drinking water standards) was the basis of the criteria. There has been an extensive public comment period for these criteria rules that has included documentation of this process and multiple meetings to answer questions specific to this process. See response to comments for Rule 49(1)(DD).	

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34	(2)	ARCADIS	*9-13-2016*: Developmental and Reproductive Toxicity Values and Endpoints: The DEQ defines the reference dose (RfD) as "an estimate of the daily oral exposure to the human population, including sensitive subgroups and lifestages, that is likely to be without appreciable risk of adverse effect during a lifetime." Similarly, the reference concentration (RfC) is "an estimate of the continuous inhalation exposure to the human population, including sensitive subgroups and lifestages, that is likely to be without appreciable risk of adverse effect during a lifetime." Based on this definition, the chronic RfDs and RfCs account for sensitive receptors, including pregnant women, and for exposures over a lifetime. Therefore, it is not appropriate to use these toxicity values for single day or full-term exposures during pregnancy. Because intake doses are generally higher for children than adults, current USEPA (and various state agencies) guidance is to evaluate a child receptor (versus an age-averaged receptor) for noncancer effects for residents (USEPA 2016). Arcadis recommends the use of the chronic toxicity values in conjunction with chronic exposure scenarios. *10-18-2016* comment resubmitted with addition: If DEQ choses to evaluate short-term developmental exposures, then DEQ should derive developmental toxicity values following USEPA guidance.	The DEQ agrees the definitions of reference dose (RfDs) and reference concentrations (RfCs) include that they are protective of sensitive subgroups and lifestages. The need for these values to protect sensitive subgroups and lifestages is why USEPA IRIS has RfDs and RfCs based on developmental endpoints when they are the most sensitive noncancer adverse effect. Other sources of toxicity values also have health benchmarks based on developmental toxicity endpoints (USEPA PPRTV, ATSDR, USEPA OPP, other states). The DEQ has used appropriate receptors and exposure assumptions to assess the risk for these developmental toxicity endpoints in accordance with USEPA guidance. USEPA and other states use a child receptor as the residential receptor for noncancer endpoints because of greater exposure for this lifestage. The DEQ followed the recommendations of the CSA (see response to comment on Rule 34(2) above and 49(1)(O) below) and developed a process to address developmental toxicity. The process used is consistent with USEPA guidance and recent USEPA risk assessments under TSCA (TCE, 2014 and n-methylpyrrolidone, 2015) that address developmental toxicity. The DEQ used toxicity values based on developmental endpoints consistent with USEPA guidance and USEPA risk assessment practice. See response to comments for Rule 49(1)(DD).	None
34	(2)	CONSUMERS	*9-13-2016*: Environmental data representing the exposure assumptions used to develop criteria under Rule 34(2) is a complicated task to perform with all of the assumptions used by the DEQ are not known or readily available in the rules package (versus a technical support document). *10-18-2016*: Comment resubmitted	The exposure assumptions for all developmental criteria are provided in the proposed Rules. The basis for the exposure assumptions are either in the Criteria Resource Document or the TSG Developmental Report. It is impractical to provide all technical detail in the administrative rules.	

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				See response to comments for Rule 49(1)(DD).	
40		MMA KUHN	The DEQ proposes removing Rule 40 which requires DEQ to provide the mathematical equations, applied statistics and assumptions in establishing cleanup criteria. This is obviously of great concern, since it is unlikely that the use of generic criteria can be evaluated and calculations or references confirmed without significant supporting data demonstrating the consistency of any specific site with the generic assumptions. Accordingly, many sites will have to rely upon site-specific criteria. How would a calculation error, typo or wrongly used reference be identified by the DEQ without this additional quality assurance check? MMA members, in their time-limited review of these rules have already found a number of chemical-specific and systematic calculation errors, missing factors and just plain wrong values and equations. Rescinding the rule which requires the DEQ to "show its work" in developing the calculations for establishing criteria, places a regulated party in a significantly compromised position in countering the MDEQ. It also reduces the confidence that parties, whether the general public or someone implementing a response activity, would have that the criteria were generated correctly. In this age of governmental transparency, it is difficult to understand why the DEQ does not want to disclose the calculations, mathematics, and computer programs it uses for establishing risk assessments, exposure assumptions, and other elements it uses in establishing cleanup criteria. • The regulated community could be subject to the establishment of criteria for cleanup without any supporting evidence of the assumptions and applied mathematics which support that criteria. • Mistakes in the calculation of generic criteria may go undetected and confidence in the accuracy of the generic criteria will be questioned.	Statutory amendments effective January 2015 added MCL 324.20120a(19) that requires the DEQ to make available the algorithms used to calculate all residential and nonresidential generic cleanup criteria, and tables listing, by hazardous substance, all toxicity, exposure, and other algorithm factors or variables used in the DEQ's calculations. Rule 40 was proposed to be deleted because it duplicated this statutory requirement. The DEQ's generic inputs for the IEUBK and Adult Lead Models are presented in the DEQ Criteria Resource Materials document published in support of these rules. The DEQ's generic EMSOFT model inputs will be added to this document for transparency. On 9/29/2016 this rule was modified rather than deleted in response to these comments.	No further rule revision is required.

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			• This will also hinder regulated parties from being able to rebut certain technical assertions of MDEQ in contested matters, such as review panel appeals. If the MDEQ is not required to show how it developed its criteria, it makes it more difficult for the regulated parties to rebut the applicability of the criteria. The rule needs to be reinstated and possibly revised to take into account other proposed rule changes and provide direction on updating the criteria.		
40		HALEY	No transparency to criteria changes Concern with rule and potential consequences: 299.40 (The Transparency Rule) requires DEQ to provide the math or science behind establishing cleanup criteria, which DEQ proposes be rescinded. The consequence of this is that DEQ will no longer be required to be transparent with changes to cleanup criteria and process requirements. This will significantly reduce certainty and consistency for the regulated community and will provide the DEQ the ability to make further rule changes without checks and balances provided with transparency that 299.40 currently provides. Proposed modification to proposed DEQ change: Do not rescind or modify 299.40.		
40		PM	The proposed rules eliminate the statutory requirement for the DEQ to be transparent (i.e., by removing Rule 40). The elimination of transparency, combined with the proposed rule to allow the DEQ to make changes to certain criteria outside of the rulemaking process [Rule 6(19)] allows the DEQ unlimited authority to create new criteria with zero oversite or outside input. This will create undue burden on property owners and expose the DEQ to litigation.		
40		WEC	The DEQ has proposed to rescind, in its entirety, R299.40. This important provision provides that the detailed basis for the calculation of any cleanup criterion established under the Part 201 rules be made available to the public. This provision is inclusive and encompasses all references used to calculate the cleanup criteria, including studies, papers, and other sources of information that were used		

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			or considered. The current rule also requires that any proposed change to a criterion be published by the DEQ and subject to review and comment as part of the rulemaking process. It is not clear why R299.40 is proposed for rescission. Abandoning this transparency is especially perplexing in light of the proposed extensive changes made in determining generic and site-specific criteria. It is essential that the regulated community have all information available to assess and understand the assumptions used by the DEQ in formulating criteria. In sum, R299.40 should not be rescinded.		
		CHAMBER	The draft rules propose to delete R 299.40, which requires the DEQ to make available to the public the basis for calculating each criterion. Transparency was a fundamental goal of the CSA process. Eliminating the requirement in the rules for the DEQ to be transparent in its decision-making directly contradicts that goal.		
		BARR	The DEQ has done a great job of sharing the information used to create the update for the cleanup criteria; therefore it seems out of character that this rule would be rescinded.		
40		CONSUMERS	*9-13-2016: The* DEQ has made great strides in sharing information used to create the update for the cleanup criteria; therefore, rescinding this rule seems a misalignment. *10-18-2016 Additional comment*: - The DEQ has not provided the inputs for IEBUK model used in Rule 49 (L) and the EMSOFT default inputs for Rule 26 Equation 10 $J^{avg}_{s,fin}$ and these should be made available.		
		BARR	*9-13-2016*: The DEQ has not provided the inputs for the IEBUK model used in Rule 49(L) and the EMSOFT default inputs for Rule 26 Equation 10; these should be made available. *10-18-2016*: Comment resubmitted		
46	(5)	KAYLOR	"definitions" is misspelled.	On 9-29-2016 this rule was corrected.	No further revision necessary

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46	(6) Table 1	MMA	*9-13-2016*: The DEQ has incorrectly published the state drinking water standards with more significant digits than the standards actually have. This incorrect addition of a significant digit would resulting in identifying a detection of 5.1 ppb in a groundwater sample as exceeding the criteria by the Part 201 program when it would not be an exceedance of the SDWS under the state drinking water program. This is inconsistent with the statutory requirement to use the SDWS where they exist. Include only a footnote in Table 1 for these substances and generating a new table in the rules for substances that have a SWDS so that the appropriate significant digits for each drinking water standard can be accurately presented. *10-18-2016*: It appears the DEQ has modified a number of MCL concentrations in Table 1 of its April 2016 proposal to correct for the inappropriate significant digits. Not all of these MCLs, however, were corrected. For example, barium is listed as 2000 ug/L in Table 1 whereas the promulgated MCL is listed 2 mg/L. We recommend that the DEQ carefully re-review the Table 1 and make any necessary changes. Standards, such as barium, that are reported as a whole number in units of mg/L, may be best represented in a footnote table that reflects the true, promulgated value of the MCL. As previously stated in our comments, the DEQ cannot legally change the number of significant digits in a promulgated MCL.	The criteria tables were modified to reflect the MCLs/ SDWS as included in the State Drinking Water Act rules (listed as parts per million or mg/l). Similarly a criterion based on a national secondary drinking water standard (SMCL) is listed as parts per million or mg/l. See also overall comment regarding significant digits.	Rule 46 Table 1, Rule 49 Footnotes (A) and (E)
46	(6) Table 1	MMA	*9-13-2016*: The DEQ has not included SDWS for chemicals such as ethylbenzene, toluene, and xylene. The DEQ is required by statute to use such standards where they exist. . Correct the table so that the drinking water criteria for both residential and nonresidential accurately reflect the SWDS or aesthetic value for all applicable substances.	The statutory provision [MCL 324.20120a(5)] allows when there is not a national secondary drinking water standard (SMCL) that the DEQ may determine according to methods approved by the USEPA the concentration below which taste, odor, appearance or other aesthetic characteristics are not adversely affected and that the criterion becomes the more stringent of (a) a SDWS, (b) a SMCL or (c) a DEQ derived aesthetic value. The aesthetic values for ethylbenzene, toluene, and xylene are a DEQ determination completed December 1991 by ABB Environmental Services,	Rule 46(6) Table 1

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				Inc., through use of USEPA Method 140.1. As these are the more stringent than the SDWS they are appropriately included as the generic drinking water criterion. See also response to comments for Rule 10(3).	
46	(6) Table 1	MMA	*10-18-2016*: Serious flaws in the April 2016 proposed criteria for vinyl chloride were identified after MMA's September 13, 2016, comments were submitted. These errors, which still persist in the DEQ's revised October 2016 proposed rules, result in criteria that are not sufficiently protective of reasonable maximum exposure (RME) scenarios. In other words, the generic criteria would allow potential exposures to these chemicals that are higher than appropriate for generic criteria and higher than allowed by USEPA and Michigan's neighboring states. The DEQ's allowance of higher exposures for these chemicals does not reflect the best available science and assumptions, but instead reflects errors in the calculations and interpretation of the best available science. The generic residential criteria for vinyl chloride are higher than USEPA's criteria not because of different exposure assumptions, but because of the DEQ's incorrect interpretation and usage of USEPA guidance. Specifically, the DEQ appears to have not followed USEPA's recommendation for a unique set of equations to account for early life exposure to vinyl chloride (Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, EPA/630/R-03/003F, March 2005). Correctly implementing USEPA's recommendations, as is done throughout the United States, results in a generic residential direct contact and vapor intrusion criteria that are about one-half of the DEQ's proposed value. Recommended Action: Cancer-based criteria for vinyl chloride (VC) should be calculated using the unique set of equations in USEPA guidance. The DEQ should consult Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, EPA/630/R-03/003F,	The DEQ will use the USEPA vinyl chloride-specific regional screening level equations with DEQ generic inputs. The equations take into account the greater sensitivity to vinyl chloride during early life by using lifetime averaging of continuous exposure from birth to adulthood and no averaging for childhood exposure.	Rule 49 Footnote (LL), Rule 46(6) Tables 1, 2, and 4

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			March 2005 for further information. USEPA's Regional Screening Levels show an example of how generic criteria can be calculated following USEPA's 2005 guidance.		
46	(6) Table 1	GOLDER	*9-13-2016*: Golder understands that the groundwater values proposed in Table 4 are based on calculation methods similar to those used in the Johnson & Ettinger Model (DEQ, 2013). Although Golder did not attempt to review the calculation for all compounds, it appears that there is a fundamental calculation discrepancy that has led to proposed numbers that are very low. Based on looking at the following select compounds: benzene, 1,4-Dioxane, Tetrahydrofuran (THF) and Tertiary Butyl Alcohol (TBA). Based on these factors it would appear that there may be an error in DEQs calculations and the proposed VI groundwater screening values should be rechecked. Given the coincidence that the USEPA screening level is 29,000 for 1,4-dioxane at 10-5 risk compared to 29 in the DEQ table, it appears to be a unit/conversion error. If not, then a clearer explanation and justification regarding why the DEQ proposed screening levels are purposely so much lower than USEPA's is warranted. Furthermore, it would be appropriate to include the target indoor air levels in Table 4 to assist the comparison of indoor air levels to concentrations in subsurface media. *10-18-2016*: Golder understands that the groundwater values proposed in Table 4 are based on calculation methods similar to those used to calculated USEPA vapor intrusion screening levels (VISLs (USEPA 2016). Although Golder did not attempt to review the calculation for all compounds, it appears that there is a fundamental calculation discrepancy that has led to proposed numbers that are very low for certain compounds – in particular for 1,4-dioxane and Tertiary Butyl Alcohol (TBA).	Based on the review of the provided comment the VI Tier 1 value for 1,4-dioxane and other hazardous substances that were included in the former (OO) footnote have been revised to calculate criteria using the available sufficient chemical-physical information and the standard equations. Modifications required Footnote (OO) to become Rule 49(1) Footnote (CC). This footnote lists those hazardous substances where there is not sufficient chemical-physical information, and the screening level or criteria may be developed pursuant to Rule 27(7). However, the DEQ disagrees that the groundwater values proposed in Table 4 are lower than the USEPA Target Groundwater Concentration as they are not based on comparable conceptual site models for groundwater. The VI Tier 1 values are reflective of shallow groundwater where the Johnson and Ettinger model does not apply. A party may be able to use this model and obtain similar values to USEPA Target Groundwater Concentrations with a VI Tier 2 calculation if the depth to groundwater is greater than the depth of the proposed or planned structure considering the footings and foundation. The vapor screening values are reflective of a 0.03 attenuation factor. Clarification has been provided in Rule 27(7)(5) and Rule 27(16) Table 1.	None
			9-13-2016: The groundwater values proposed in Table 4 are substantially lower (by 2-3 order of magnitude) than the Target Groundwater Concentration published by the USEPA in the Vapor Intrusion Screening Level Calculator (VISL) (USEPA, 2016) when assuming a target cancer risk	See response to comments for Rule 27(3)(f).	

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			of 1.0E-05 as summarized in the table below. The discrepancy is particularly significant given that that the USEPA VISL uses a conservative default attenuation factor for groundwater of 0.03, the same default attenuation factor recommended by DEQ in the revisions to the Part 201 Criteria (DEQ, 2016). *10-18-2016*: Comment resubmitted		
			9-13-2016: The proposed DEQ vapor intrusion screening level for groundwater is lower than the value for the residential drinking water criteria proposed by DEQ in Table 1 Groundwater: Residential and Nonresidential for benzene, THF, and TBA, and near the proposed drinking water criteria for 1,4-Dioxane. It would seem unlikely that the proposed criteria for drinking water would be less restrictive than the VI screening criteria particularly considering the properties of 1,4-Dioxane, THF and TBA (miscible and low Henry's Law value). *10-18-2016*: Comment resubmitted		
			9-13-2016: Furthermore, we could not reproduce the values proposed by DEQ for the VI screening criteria. In particular, it is unclear what chemical-specific attenuation factors the DEQ is using. Attempts to calculate chemical-specific groundwater attenuation factors with the Johnson &Ettinger Model, using the proposed Part 201 input parameters, results in attenuation factors which range from 0.002 to 0.003 and result in groundwater vapor intrusion screening levels 2-3 orders of magnitude greater than the proposed values, indicating that the proposed values may be in error. *10-18-2016*: Comment resubmitted Based on these factors it would appear that there is an error in DEQs calculations and the proposed VI groundwater screening values should be rechecked and corrected. Furthermore, it would be appropriate to include the target indoor air levels, as well as, the temperature-dependent Henry's law constant, in Table 4 to assist the comparison of indoor air levels to concentrations in subsurface media.		
46	(6)	MMA	*10-18-2016*: The DEQ should add a table of the AACs that	The AAC are not criteria that should be	None

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	Table 4		are used for the derivation of the generic screening levels and cleanup criteria. As discussed in the preceding comment, these AAC should be derived by using toxicity values and exposure factors that are consistent with the exposure scenarios that are the basis of the generic screening levels and criteria, and not the acute/intermediate AACs that the Department of Public Health and Human Services may use in evaluating the need for evacuation of building occupants. Generally, we expect the AACs used in the derivation of Part 201 screening levels and criteria to be based on chronic RfCs and IURs, because they are to be used with exposure assumptions reflective of long-term exposures.	promulgated in the criteria tables. The DEQ intends to publish Acceptable Air Concentrations as part of the updated DEQ's vapor intrusion guidance. The AAVs are calculated pursuant to equations of Rule 27(14); except for those designated with short-term toxicity concerns [Rule 49(1) Footnotes (EE)& (FF)]. The Acceptable Air Concentrations (AACs) for a hazardous substance is the minimum of the calculated AAVs for that hazardous substance. See also response to comments for Rule 49(1)(QQ).	
49	(1) (AA)	MMA	*10-18-2016*: The DEQ's revised criteria rule proposal still includes the proposed reduction of the specified solubility limit for methane from 28,000 µg/L to 22,000 µg/L. The lower solubility limit proposed by the DEQ is based on an assumed groundwater temperature of 25 degrees Centigrade/77 degrees Fahrenheit. This assumed temperature is not at all representative of groundwater conditions in Michigan and is inconsistent with R299.7(4) and R299.27(13) Table 1 which define the default subsurface temperature in Michigan to be 10°C. By contrast, the current solubility limit of 28,000 µg/L is based on a groundwater temperature of 13 degrees Centigrade/55 degrees Fahrenheit, which represents the upper end of average groundwater temperature ranges in Michigan. The proposed solubility limit of 22,000 µg/L may reflect "standard" conditions in a laboratory setting. It does not reflect field conditions in Michigan. The proposed solubility limit of 22,000 µg/L, which serves as the FESL for dissolved-phase methane in groundwater, is unrealistically low, and inevitably will result in the need for unnecessary investigation and response measures. The proposed solubility limit does not reflect sound science and is not necessary for the protection of human health or the environment.	This was further discussed as part of the Phase II Stakeholder Process. Based on those discussions the DEQ has revised criteria tables 1 and 4 to change the water solubility value from 2.20E+4 ug/l to NA. The FESL will remain 10,000 ug/l. Contrary to the assertions, solubility does not serve as the methane FESL. The 28,000 µg/L was previously footnoted as the value for "all other conditions" when 10,000 µg/L did not apply. The 28,000 µg/L was never identified by the DEQ as methane's water solubility. The existing rules list NA for methane solubility. The proposed methane FESL is established in Footnote (AA) as 10,000 µg/L consistent with regulatory action levels used by USEPA Region 5 states and recommended by the US Department of the Interior. The FESL provides a screening level that triggers evaluation to document whether additional response activity is required to protect against an acute flammability and explosivity hazard. Additional information regarding the use of the 10,000 ppb as a trigger for further evaluation is	Rule 46(1), Tables 1 & 4

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			Recommended Action: The MMA requests that the DEQ withdraw the proposed change in the methane solubility limit and retain the current limit of 28,000 µg/L. Modified subrule language provided for footnote (K).	available in the DEQ Criteria Resource Materials. The proposed methane solubility value of 22,000 ug/l was consistent with all water solubility values presented in Rule 50 – Table 3. Where solubility is used as generic criteria [Rule 6(6)] the rule provision retains the same language as used since 2002 [2002 Rule 708(2); 2013 Rule 8(2)] that "if the calculated health-based value is greater than the solubility limit of the hazardous substance **in water at 25 degrees Celsius**, then the solubility limit is the generic groundwater criteria. A person using generic criteria has the ability to propose the use of site-specific values consistent with MCL 324.20120a(1) and 20120b. How a site-specific solubility value would substitute as a criterion is established by the rule provisions.	
		MMA	*10-18-2016*: The DEQ's revised criteria rule proposal still includes the proposed reduction of the specified solubility limit for methane from 28,000 µg/L to 22,000 µg/L. The lower solubility limit proposed by the DEQ is based on an assumed groundwater temperature of 25 degrees Centigrade/77 degrees Fahrenheit. This assumed temperature is not at all representative of groundwater conditions in Michigan and is inconsistent with R299.7(4) and R299.27(13) Table 1 which define the default subsurface temperature in Michigan to be 10°C. By contrast, the current solubility limit of 28,000 µg/L is based on a groundwater temperature of 13 degrees Centigrade/55 degrees Fahrenheit, which represents the upper end of average groundwater temperature ranges in Michigan. The proposed solubility limit of 22,000 µg/L may reflect "standard" conditions in a laboratory setting. It does not reflect field conditions in Michigan. The proposed solubility limit of 22,000 µg/L, which serves as the FESL for dissolved-phase methane in groundwater, is unrealistically low, and inevitably will result in the need for unnecessary investigation and response measures. The proposed solubility limit does not reflect sound science and is not necessary for the protection of human health or the environment. Recommended Action: The MMA requests that the DEQ withdraw the proposed change in the methane solubility limit and retain the current limit of 28,000 µg/L. Modified subrule language provided for footnote (K).		
		ARCADIS	*10-12-2016*: The Revised Rule Package incorporates several changes from the initial Rules pertaining to methane, including concepts and, to a lesser degree, language recommended in our August 3 comments. We acknowledge and appreciate the DEQ's incorporation of these methane-related revisions in the Revised Rule Package. Among the most important of our comments		

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			was that the DEQ reconsider its proposal to lower the specified solubility limit for methane from the current level of 28,000 micrograms per liter (µg/L) to 22,000 µg/L. The lower solubility limit proposed by the DEQ is based on an assumed groundwater temperature of 25 degrees Centigrade/77 degrees Fahrenheit. As explained in our previous comments, this assumed groundwater temperature is not at all representative of groundwater conditions in Michigan. The resulting solubility limit, which serves as the FESL for dissolved-phase methane in groundwater, is unrealistically low, and inevitably will result in unnecessary/additional investigation and possibly response measures. For this reason, we respectfully reiterate our request that the Revised Rule Package be further modified to restore the specified solubility limit for methane to the current level of 28,000 µg/L. As an alternative, the rules should provide for adjustment of the solubility limit-based screening level using actual groundwater temperature.		
49	(1)(K), (AA), (GG)	MMA	*9-13-2016*: It has been proposed that the three methane footnotes be consolidated and revised. Issued include the role of pressure, additional methane sources, unventilated structures, methane solubility, facility designation, point of compliance, VI, lack of toxicity, methane attenuation and site-specific determinations. Proposed revisions have been provided.	The DEQ has reviewed the use of the three methane criteria tables [Rule 49(1)] footnotes and has determined that it is appropriate to maintain the separate footnotes, Each footnote addresses a distinct circumstance: (K) Identifies the hazardous substance as flammable or explosive or both. At this time the only hazardous substance footnotes as (K) is methane but it may be appropriate to use this footnote for additional hazardous substances. For example, the DEQ has recently been requested to review hydrogen sulfide, also a highly flammable substance. (AA) Identifies the basis for the methane Flammable and Exclusivity Screening Level (FESL) since the value is not based on the calculation from the FESL equation in Rule 16. (GG) Identifies the basis for the methane VI vapor screening level since the value is not based on the equations of Rule 27.	No further rule revision is required.
		CHAMBER	The draft rules propose to change the evaluation and development of methane criteria. Revisions are necessary to address flammability and explosivity risks and other issues unique to methane. Consolidate and revise the three methane footnotes and certain values to provide clarity. Issues include the role of pressure, additional methane sources, unventilated structures, methane solubility, facility designation, point of compliance, VI, lack of toxicity, methane attenuation, and site-specific determinations.		

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				Merging the footnotes would not provide the clarity that the separate and distinct footnotes provide. Footnote (AA) was modified 9-29-2016 in response to comments received.	
		ARCADIS	*8-4-2016*: These comments pertain to the provisions of the Proposed Criteria Rules addressing or affecting Part 201 cleanup criteria and screening levels for methane. Incorporated into and accompanying these comments are recommended drafts of the following: • Accurate and appropriate information for relevant pages from R 299.46, Tables 1 and 4, and R 299.50, Table 3, all pertaining to methane. • A revised and expanded version of footnote (K), R 299.49(K), consolidating the content of current footnotes (K), (AA), and (GG). • A proposed new subparagraph (v) to be added to R 299.27(2)(d). As explained in the attached, to a large extent these comments arise out of the erroneous methane solubility limit incorporated into the flammability and explosivity screening level (FESL) for dissolved-phase methane in groundwater and the Tier 1 vapor intrusion (VI) screening level for dissolved- phase methane in groundwater. The chosen solubility limit is based, in turn, on an unrealistically high, non-representative groundwater temperature assumption. Additionally, the proposed FESL and Tier 1 VI screening level for dissolved-phase methane are unnecessarily conditioned upon assumptions that are already accounted for in the proposed value. We believe the best approach would be to continue the currently existing Part 201 methane FESL in effect 10,000 micrograms per liter (IJg/L) where groundwater enters a structure though the use of a water well, sump, or other device, and 28,000 IJg/L for all other uses. We would also support a Tier 1 VI methane screening level (groundwater) and solubility limit of 28,000 IJg/L in Table 4 of R 299.46. We believe this result reflects (A) accurate science, (B)	On 9-29-2016 Footnote (AA) was modified and a subrule was added to Rule 16 to indicate the FESL is not a cleanup criterion for determining "facility" status in response to comments received.	

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			regulatory consistency, and (C) representative conditions in Michigan. As an alternative, we would be willing to support some of the DEQ proposed revisions, subject to the clarifications, corrections, qualifications, and limitations explained in these comments, and subject to the DEQ acceptance of the accompanying draft rule footnote provisions. To the extent the DEQ intends to refer to the June 16, 2016 Technical Support Document (in its current draft form or as modified in the future) for purposes of interpreting and administering the criteria and screening level rules, the TECHNICAL Support Document should be modified to reflect these comments and should be clarified to more transparently reflect the basis for the values cited in it (e.g., laboratory conditions). The attached comments address our evaluation of the proposed methane solubility limit and related temperature inputs, and more generally our concerns regarding the proposed changes to methane screening levels and related values. Recommendations are provided for each comment, as well as proposed alternatives that address our concerns while maintaining the conservative approach to methane risks desired by the DEQ.		
49	(1)(L)	MMA	Use of "sliding scale" (soil vs. gw exposure etc.) for lead (as per current rules)	This was further discussed as part of the Phase II Stakeholder Process. Based on those discussions the DEQ updated the IEUBK model inputs, including the residential drinking water criterion, used in developing the residential soil direct contact criterion for lead. The DEQ has revised the lead footnote to authorize site-specific remedy values based on the combination of lead in groundwater and soils similar to existing language.	Rule 49 Footnote (L)
49	(1)(O)	CONSUMERS	*9-13-2016*: DEQ's adoption and reliance on toxic equivalency factors (TEFs) and related concepts add unnecessary uncertainty and complexity. In at least four rules, the DEQ adopts the use of TEFs: rules 299.34(1)(a)	The toxic equivalency factor (TEF) approach for the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (dl-PCBs) proposed in	None

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			and 299.49(1)(O) for dioxin and "dioxin-like" compounds, including PCBs; rule 299.34(1)(b) for carcinogenic polynuclear aromatic hydrocarbons; and rule 299.4(11) for any other "isomers of hazardous substances" that DEQ identifies. When developing and applying TEFs, uncertainty can arise for many reasons, including problems extrapolating from animal studies to humans, determining whether different compounds behave similarly in the human body for all effects, and differences in the half-life of compounds (and, accordingly, body burden). Further, TEFs are generally developed based on one particular type of exposure (e.g., food intake) and often are not suitable for use with other exposure pathways (e.g., dermal contact), resulting in the use of TEFs for one type of exposure at a site, but not for others. Finally, there appears to be little limitation or guidance in the proposed rules. For example, all compounds with "documented dioxin-like activity" and TEFs or "other relative potency factors recognized by [the USEPA]" are included in the dioxin rule, without explaining what some of these crucial terms mean. ("Documented" by whom? "Dioxin-like" in what way? "Recognized by USEPA" how?) In the end, this is a complex and burdensome requirement with doubtful or minimal benefit. Possible Solution: The TEF concept should remain limited to dibenzodioxins and dibenzofurans as set forth in the current rules. These compounds arguably have the most developed, studied, and agreed upon TEFs (but are not themselves without controversy). *10-18-2016*: Comment resubmitted	these rules has wide acceptance across the globe, the National Academy of the Sciences supports the approach, and the USEPA recommends the approach and the TEFs. The dioxin-like toxicity of coplanar PCBs and additivity with the PCDDs and PCDFs has been well documented, recognized in the scientific community since the early 1990s (Ahlborg et al, 1994; Barnes et al, 1991), and widely accepted with the publication of the 1998 WHO consensus TEFs (van den Berg et al , 1998). The support for the additivity including dl-PCBs was reevaluated in 2005 (van den Berg et al, 2006; Walker et al, 2005). Excluding dl-PCBs from the total TEQ is not consistent with best available science would not adequately protect public health when mixtures of these contaminants including dl-PCBs are present at a site. The DEQ does expect there will be some sites where only PCDDs and PCDFs are present, some sites where only dl-PCBs are present, and some sites where PCDDs, PCDFs, and dl-PCBs are present from releases at that site. A site-specific evaluation for these conditions is appropriate. The TEFs proposed have both documented dioxin-like activity **and** have TEFs recognized or recommended by the USEPA. The PBDDs and PBDFs were removed from the proposed rules because they did not meet both of these requirements. These chemicals are always found in mixtures, not as single chemicals, so the use of ½ the detection limit is appropriate, consistent with addressing non-detects in other assessments of mixtures, and another approach can be proposed such as that found at https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites.	
49	(1)(Q)	BARR	*9-23-2016*: Based on the currently wording of this	The USEPA finalized the IRIS toxicological	None

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			footnote, it is unclear if it applies to all pathways or just to those where the most restrictive health based criteria has a carcinogenic endpoint. The DEQ should add a line to the Tables in Rule 49 that is the cPAHs and list only carcinogenic endpoints.	assessment of BaP in January 2017. The final toxicity values remain unchanged from the draft values presented in the September 2016 version of the draft Part 201 rules. DEQ references were updated in the cPAH chemical update worksheets to reflect that the same values are no longer draft. The hazardous substance definition in statute allows the DEQ to demonstrate that any "substance" poses an unacceptable risk to public health, safety, or welfare, or the environment. The term "substance" is used in statute, not "a single chemical." The interpretation that "substance" can be inclusive of more than one chemical is supported by case law where the singular includes the plural and vice versa. DEQ has historically regulated hazardous substances comprised of more than one chemical (e.g., petroleum and hazardous waste), such that this is not a novel concept being newly applied to only the cPAHs in these proposed rules. Footnote Q's language to add the analytical concentrations of the individual RPF-adjusted cPAHs and comparison of that sum to the criterion for BaP maintains the statutory cancer risk level at 1:100,000. The BaP and cPAHs are considered members of the same family as they exhibit similar toxicological properties, i.e. carcinogenic effects, but differ in the degree of toxicity. Since BaP toxicity has been well studied, the USEPA recommended the use of "relative potencies" for the individual cPAH in relation to BaP as the reference chemical (USEPA, 1993). Similar to the USEPA RSLs and other states, the MDEQ proposed criteria for these substances are derived using the relative potencies (RPF) which are similar to the toxicity equivalence factors (TEFs) since like TEF's applied to chlorinated dibenzodioxin and furan compounds in that the relative potencies describe the cancer potency of a cPAH relative to	
		CONSUMERS	*9-13-2016*: Based on the current wording of footnote Q, it is unclear if it applies to all pathways or just to those where the most restrictive health based criteria has a carcinogenic endpoint.		
		MMA	*10-18-2016*: The DEQ made one necessary revision to Footnote "Q" in Rule 200.49(1) regarding the evaluation of carcinogenic PAHs. However, it did not make all of the necessary revisions that were identified in the MMA's comments in September that related to Footnote Q. Specifically, the MMA urged the DEQ to abide by the CSA guiding principles to rely on the best available, most sound scientific information and to be readily transparent relative to selection of the most appropriate toxicological values and classifications to be used in generating the generic cleanup criteria and screening levels. Nowhere in the accepted CSA tiered system does it include the use of draft (i.e., non-final) values. In the October 12, 2016 MMA meeting, the DEQ stated that it continued to use IRIS Stage 5 draft values because such values were in the final stage of review and unlikely to change. The DEQ did not indicate what information they relied upon to make this determination. This is assumption that the draft criteria will not change once finalized is a poor one at best based on the history of draft versus final IRIS values. The DEQ apparently is unaware of the scientific debate surrounding the draft IRIS toxicity values for benzo(a)pyrene (BAP), which is the basis of the cancer toxicity values for all carcinogenic PAHs, and it apparently ignored the fact that the IRIS Stage 5 draft values for trimethylbenzenes (TMBs), which were not the subject of significant scientific debate, were not the final values published in September 2016. Specifically, the final IRIS RfD and RfC for TMBs were 5 and 1.2 times less stringent than the IRIS Stage 5 draft values.		

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			Similarly, the final toxicity values for trichloroethene were also different that the IRIS Stage 5 draft values. If the DEQ would have followed the recommendation to not use draft toxicity values and adopted the recommended table of values provided by MMA, the DEQ would have avoided another flaw created by Footnote Q. In both the April 2016 and October 2016 proposals Footnote Q went beyond the bounds of Section 20120a of the statue and attempted to apply a single chemical cancer risk limit of 1 in 100,000 (or 1x10-5, or 1E-5) as a cumulative cancer risk limit for BAP and 6 other carcinogenic PAHs. As in comments elsewhere in this submittal, the DEQ cannot adopt changes to the administrative rules that are contrary to the statute. The MMA's comments on the April 2014 proposal explained how the DEQ could avoid such an egregious overstepping of legal authority by suggesting it use the common scientific practice of applying the TEFs for carcinogenic PAHs to the BAP toxicity values, which results in calculating a cancer criterion for each of the carcinogenic PAHs, as is done in the current rules from December 2013, and by USEPA in the Regional Screening Levels. Instead, the DEQ decided to apply the generic criterion for one chemical (BAP) to the sum of concentrations from 7 carcinogenic PAHs, which is completely unnecessary for the derivation of generic criteria. Recommended Action: The DEQ should delete its proposed Footnote Q in Rule 299.39(1), which ultimately attempts to regulate exposure to multiple chemicals using the cancer risk limit intended by statute to apply for a single chemical. The DEQ should use the existing sound science in the existing Footnote Q to the generic criteria that uses the TEFs to calculate toxicity values for the other carcinogenic PAHs, which would result in cancer-based criteria for each of these chemicals.	the reference chemical in the group, i.e., benzo(a)pyrene. The use of the well accepted science-based RPF approach in deriving health risk-based criteria for the cPAHs is particularly important in protecting public health as BaP is known to be carcinogen with a mutagenic mode of action that affects critical early life stage exposures (USEPA 2005). cPAHs with CSFs based on the RPF-adjusted BaP slope factor are therefore also considered mutagenic. The DEQ considers the RPF a necessary and well-accepted scientific approach that will protect the human population, specifically children, from the mutagenic effects of the cPAHs. Groups of chemicals (e.g. xylenes) that are called "isomers" are generally found in mixtures and the health effects are due to exposure to mixtures containing isomeric compounds making it difficult to determine the contribution of each isomer to the observed health effect. Additionally, most of these isomers have similar toxicological effects. Therefore, to be protective of the overall health effect of these isomers, Rule 299.4(8) is necessary in appropriately assessing the health risk due to exposure to these groups of hazardous substances. Guidance on the application and implementation of the criteria for dioxin and dioxin-like chemicals, cPAHs and isomers will be included in the DEQ Criteria Resource Materials to allow detailed information and inclusion of application examples. The use of half the detection limit in place of non-detect values when applying the TEF approach is an acceptable USEPA method. Site-specific information supporting use of other methods can be proposed to the DEQ. Similar to the TEF-based assessment of dioxins and dioxin-like substances, the use of the RPF approach will ensure public health protection against	

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				exposures to cPAH. TEF has been replaced with Relative Potency Factor (RPF) in Footnote (Q) for consistency with USEPA current terminology and practice. See response to comments for Rule 34(1).	
49	(1)(DD)	MMA	The DEQ has created a new generic criteria that the DEQ believes necessary to be protective of adverse developmental or reproductive effects which are assumed to occur due to shorter term exposure. The process to calculate the criteria is novel and was not peer reviewed or vetted by outside practitioners. The development is contrary to the CSA guiding principles. It appears the DEQ scoured whatever literature sources available to identify 47 substances as development toxicants. Final IRIS toxicity determinations for 28 substances were based on developmental endpoints, yet EPA did not identify the need to create and evaluate a separate exposure scenario like the DEQ has proposed. The final IRIS chronic value was deemed sufficiently protective for developmental and non-developmental endpoints by USEPA. The remaining 19 chemicals were identified from sources other than IRIS. The DEQ is misusing the tox data to generate the generic criteria. According to risk assessment principles the DEQ should use tox values that reflect short term exposures. Minnesota has undertaken a similar evaluation with developing health advisories for water; however they correctly matched toxicity values with the exposure scenario. USEPA and the Region 5 states do not have similar assumptions or criteria. The current rules contain a portion of the process proposed in these rules, but the list of chemicals were not commonly found at remediation sites, therefore this did not get as much scrutiny as it should have. Chemicals should not be included where IRIS or source based the toxicity value on developmental endpoints without also clearly stating that a unique scenario was necessary for criteria to be protective. The DEQ should not calculate a short term scenario (FT or SE) for chemicals where only chronic	USEPA and other agencies often identify developmental toxicity as the most sensitive noncancer endpoint for a chemical and use that value to protect for all exposure durations and that most sensitive endpoint. Cleanup criteria developed pursuant to MCL 324.20120a(4) must be protective of the most sensitive endpoint. USEPA and many other states do not single out developmental endpoints because the residential criteria are based on a child receptor (and the driver receptor for almost all exposure pathways). The USEPA applies the chronic IRIS reference dose or reference concentration unadjusted in the child only risk evaluation. The CSA agreed that the process previously used by the DEQ to address developmental and reproductive effects was inconsistent and not transparent. As a result, the CSA recommended that the DEQ develop a new process to assess the pre- and post-natal and reproductive risks to sensitive subpopulations. Improvements to the proposed process include consistent application to all hazardous substances and consideration of a full-term pregnancy exposure when developmental toxicity is altered growth. This application allows for a less stringent approach for some developmental toxicants than offered by the previous process single event exposure assumption. This approach is consistent with recent developmental toxicity risk assessments under TSCA (trichloroethylene, 2014; n-methylpyrrolidone, 2015)	Rule 49(1)(DD)

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			toxicity input factors are available. A revised footnote and list of chemicals the MMA may be willing to accept has been provided the DEQ meaningfully engages with stakeholders on the list to provide additional confidence in their inclusion. Modified subrule language provided Appendix 6: Classification and Evaluation of Developmental/Reproductive Toxicants As part of these proposed rules the Department has created new generic criteria that DEQ believes are necessary to be protective of adverse developmental or reproductive effects which are assumed to occur following shorter term exposure. The proposed classification of these chemicals appears subjective, opaque, and often ignores IRIS determinations. As well, the process to calculate generic cleanup criteria based on these short term exposures is novel and was not peer reviewed or vetted by outside practitioners prior to this proposal. The development of these short term exposure scenarios, in the selection of chemicals, in the construction of this short term exposure, and in the implementation of the calculations, is contrary to both the CSA Guiding Principles to use the best available science and specific recommendations which strongly encourages peer review of the process and use of standard methodologies. The DEQ's proposed rules do not provide clear guidelines for what underlying toxicological data would result in a chemical being defined as a developmental and reproductive toxicant, but it appears as though they scoured whatever literature sources were available to identified 47 substances as developmental toxicants, with less regard as to the quality of the determinations. Of these 47 chemicals, final IRIS toxicity determinations for 28 of them were already based on developmental endpoints, yet USEPA did not identify the need to create	The DEQ has followed the CSA Recommendations as follows: From the CSA final report guiding principles: *"The generic cleanup criteria need to be protective of public health and natural resources such that there are no unacceptable exposures to hazardous substances. Generic criteria are to be protective of the most sensitive toxic effect in a given exposure pathway for the hazardous substance in question."* To protect for developmental and/or reproductive toxicity when it is the most sensitive toxic effect, the CSA made the following recommendations: ***2.1:*** *Receptor: Use an age-adjusted child plus adult receptor that, at present, assumes exposure across two age bins, except in the case of developmental toxicants.* ***2.2:*** *Guidance:* ***Use EPA information to develop a process to account for those chemicals, or classes of chemicals, that have documented developmental or reproductive effects.*** ***2.3:*** *Descriptive Language: Use current Part 201 rules (R299.49 (DD)) that allows the agency to regulate developmental and reproductive toxicants to protect sensitive subpopulations from these substances on a chemical-specific basis.* ***For developmental and reproductive toxicants, the MDEQ should evaluate if the age-adjusted child plus adult receptor is protective of childhood and early-life-stage exposures on a chemical-specific basis.*** The CSA recommended that DEQ use an age-adjusted receptor for residential land use, although USEPA and many other states use a child only receptor for residential land use. In addition, the CSA recommended that the DEQ develop a process to evaluate if the age-adjusted receptor was	

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			and evaluate a separate exposure scenario like the DEQ has proposed. In other words, the final IRIS chronic value was deemed sufficiently protective for developmental and non-developmental exposures by USEPA based on this developmental endpoint, without the need for a new scenario to be incorporated into the assessment process as MDEQ has proposed for all developmental toxicants. The remaining 19 chemicals were identified by MDEQ as developmental toxicants from sources other than IRIS. Because time to review each of these sources was limited we were unable to fully review whether these non-IRIS toxicity values were appropriate for application to any short term exposure. MMA may be willing to assume that a less than chronic scenario is acceptable for calculating generic criteria for these 19 chemicals. However MMA would only make this assumption if the DEQ meaningfully engages with stakeholders on this list to provide additional confidence in these inclusions. This list of chemicals is included in the revised footnote DD of our proposal. In addition to the choice of chemicals to be used for developing the generic criteria, we have concerns about the factors used and the actual algorithms employed. The DEQ has constructed two exposure scenarios, one with a 40-week (approximately 9 months) duration, referred to as "full term" and the other with a single day duration, referred to as a "single event". The DEQ does not define what constitutes a substance requiring a calculation with a single event exposure, and they have to refer back to a single sentence in a 25 year old USEPA guidance as support for why a single exposure event might cause such an effect. Why this single event scenario reaches the threshold of the need for generic criteria when USEPA itself does not evaluate such a generic scenario is still an unanswered question. Setting aside the DEQ's belief that it needs to have a single exposure scenario as generic criteria, we have	adequately protective for developmental and reproductive toxicity. The DEQ developed a process to do that by comparing calculated values for each exposure pathway for both an age-adjusted receptor, child only receptor and pregnant female receptor for hazardous substances with developmental toxicity as the basis for the best available noncancer toxicity value per the CSA recommendation. USEPA CERCLA and RCRA programs do not have a specific process to address developmental toxicity since these programs use a child receptor for residential screening levels for all chemicals. The TSG Children's Environmental Health subcommittee evaluated USEPA guidance related to developmental toxicity and early life exposures. It was found that TSCA was using an approach for recent risk assessments (TCE, 2014 and n-methylpyrrolidone, 2015) that address developmental toxicity and the DEQ process adopted the TSCA approach. The DEQ process did not scour the literature, but used the CSA process to identify toxicity values that represented best available science. The process is documented in Appendix F of the DEQ Criteria Resource Materials. Briefly, the process for identifying a hazardous substance for calculations to address developmental toxicity was 1) toxicity values (oral reference dose and inhalation reference concentration) for each hazardous substance were reviewed and selected for best available science. 2) Once the best available toxicity values were selected for the hazardous substances, the basis of the noncancer toxicity values were evaluated to determine if they were based on a developmental toxicity endpoint (from exposure during early life). Only those hazardous substances with a developmental based toxicity were included for the child or pregnant woman exposure scenarios. 3) Developmental toxicity	

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			found that the DEQ is misusing the toxicological data to generate the generic criteria. According to risk assessment principles, the DEQ should use toxicity values that reflect short term exposures, referred to as "acute" toxicity values, for these "single event" encounters. However, the DEQ proposes to use toxicity values reflective of long exposures, referred to as "chronic" toxicity values. We believe that the DEQ's proposed approach does not utilize the "best science available" as required by the CSA. In a recent USEPA workshop several USEPA and state regulatory staff noted the importance of identifying appropriate toxicity values for use in valuating short-term exposure to chemicals causing developmental effects. For example, one toxicologist from the Minnesota Department of Health described an analysis of data for acute and chronic toxicity values for use in setting health advisories for water and found that evaluation of chronic exposure scenarios using chronic toxicity values often results in lower criteria than using subchronic or acute toxicity values for associated exposure scenarios. Other toxicologists identified the need to develop acute toxicity values for evaluation of short-term exposures. These discussions are described in the InsideEPA article titled "EPA Scientists, Risk Assessors Weigh Complexities of Exposure Analyses" from February 5, 2016. While Minnesota has undertaken a similar evaluation of the need to evaluate such a short term exposure, they correctly matched chemical-specific toxicity values to the exposure scenario. They did not use chronic toxicity values for less than chronic exposures, as the DEQ has proposed. Instead of following an approach similar to Minnesota's, the DEQ instead unilaterally determined that it was appropriate to evaluate such short term exposures using chronic toxicity values. USEPA's guidance clearly distinguishes between chronic toxicity values (i.e., RfD and RfC) and those developed for reproductive and	endpoint(s) from prenatal exposures were identified for single event (mortality, structural or functional abnormalities) or full-term (only altered growth) exposure scenario for the pregnant female receptor. 4) The calculations were done for each toxicity endpoint (cancer, noncancer), and receptor to determine the health-based values for each hazardous substance, exposure pathway, environmental medium, and land use. The minimum of the calculated values for each pathway and medium becomes the criterion for the hazardous substance. The only difference with the criteria calculation for hazardous substances that have a noncancer toxicity value is that those based on a developmental endpoint also include both a child and pregnant woman receptor for residential and a pregnant woman receptor for nonresidential to determine which is the most protective of public health. In many cases, cancer risk or other value (e.g., state drinking water standard) was the basis of the criteria. Minnesota does consider developmental toxicity for acute exposure, short-term exposure and chronic exposure when that is the most sensitive endpoint for those exposure periods. Chemicals that have the same value for multiple exposure periods including acute based on developmental toxicity endpoints include: acetochlor, Bentazon, benzo[a]pyrene, butyl benzyl phthalate, carbamazepine, dibutyl phthalate, dichlorofhuloromethane, dieldrin, di(2-ethylhexyl) phthalate, ethylene glycol, metalochlor, pentachlorophenol, pyraclostrobin, 1,2,3-trichloropropane, triclosan. The longer term exposure values are identified as being set at short-term value. There has been an extensive public comment period for these criteria rules that has included	

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			developmental endpoints (i.e., RfDDT and RfCDT) in its 1991 Guidelines for Developmental Toxicity Risk Assessment stating: "The RfDDT or RfCDT is generally based on a short duration of exposure as is typically used in developmental toxicity studies in experimental animals. The use of the terms RfDDT and RfCDT distinguish them from the oral or dermal reference dose (RfD) and the inhalation reference concentration (RfC), which refer primarily to chronic exposure situations." The DEQ has not used USEPA's or Minnesota's approach and derived any RfDDT or RfCDT, nor have they identified appropriate acute toxicity values. Instead, it proposes to use chronic RfDs and RfCs, which as stated above is entirely inappropriate. As stated above, MDEQ's approach is quite novel and neither USEPA Region 5 nor the Region 5 states have similar generic exposure assessments either as cleanup criteria or screening levels. MDEQ has even indicated that use of traditional statistical techniques to characterize site conditions are somehow not allowed, which is unprecedented under USEPA and in the surrounding states. Instead as written the current standards require a sample by sample comparison for chemicals that MDEQ has designated as single exposure chemicals, which is unrepresentative of environmental exposure settings and not necessary to protect public health. While it is true that the current rules contain a portion of the process proposed in these rules, the list of chemicals where MDEQ has traditionally applied this scenario were not amongst the most commonly found at remediation sites, and therefore, this exposure, which was not transparently documented in the rules or supporting technical documentation, did not get as much scrutiny as it should have. Given the number of new chemicals that the DEQ is proposing to be subject to this exposure scenario, many of which are commonly found at	documentation of this process and meetings to answer questions specific to this process. This was further discussed with the Phase II stakeholder process. The regulated community was asked to identify the chemicals designated with developmental toxicity that were of greatest concern to them. Nineteen (19) hazardous substances were identified as inappropriately classified as a developmental toxicant or having a developmental single event endpoint: acetophenone, aluminum, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, di-n-butyl phthalate, boron, bromodichloromethane, 2-butanone, carbaryl, carbon disulfide, chlorophenol 2,4-dichlorophenol, lithium, mercury, 2-methylphenol, polychlorinated biphenyls (PCBs), trichloroethylene (TCE), and 2,4,6-trichlorophenol. The developmental basis for these chemicals were re-evaluated and recommendations were made as to the most appropriate toxicity endpoints that is protective of childhood and early-life stage exposures. 2,4-dichlorophenol, and 2-methylphenol were reclassified to a full-term developmental effect because the adverse effect was not attributable to prenatal exposure only.	

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			remediation sites, it makes sense to carefully evaluate every aspect of what the DEQ is proposing for these chemicals. The DEQ has acknowledged that the derivation of these criteria was previously not thoroughly vetted with other stakeholders. It is time to correct that now, rather than to perpetuate it. Recommended Action: Provide chemical specific rationale and justification for chemicals selected to be evaluated in this manner and do not include chemicals where IRIS or the generating source based the toxicity value on developmental endpoints without also clearly stating that a unique scenario was necessary for criteria to be protective. The attached table includes revised designations of whether or not a chemical is a reproductive or developmental toxicant based on the information in USEPA's IRIS database.		
49	(1)(O) Rule 46: Table 2 Table 3 [This comment reference is for Footnote (O) but the concern is part of Footnote (DD)]	MMA	The DEQ has identified 2 exposure scenarios, full term and single event. The DEQ has to refer back to a single sentence in a 25-year-old USEPA guidance document as support for why a single exposure might cause such an effect. Why this single event scenario reaches the threshold of the need for generic criteria when USEPA does not evaluate such a generic exposure is an unanswered question. A revised footnote and list of chemicals the MMA may be willing to accept has been provided the DEQ meaningfully engages with stakeholders on the list to provide additional confidence in their inclusion. The DEQ should delete the provision that prohibits statistical approaches with the site data.	See response to comments for Rule 34(2). In addition, USEPA guidance and documentation consistently considers developmental toxicity an acute or single event exposure consideration. These USEPA guidance and risk assessments include: • USEPA Guidelines for Developmental Toxicity Risk Assessment • USEPA Risk Assessment Guidance for Superfund (RAGS), Part A , Sections 6.4.1 and 6.4.2 • USEPA RAGS, Part C, Appendix C, Section C1 • USEPA Guidelines for Exposure Assessment • A Review of the Reference Dose and Reference Concentration Processes • A Framework for Assessing Health Risk of Environmental Exposure to Children • USEPA TSCA risk assessment for trichloroethylene (2014) and n-methylpyrrolidone (2015)	
49	(1)	CONSUMERS	*9-13-2016*: Averaging time of 1 day (24 hrs) for a single	The weight of scientific evidence for prenatal	

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	Footnote (DD)		event exposure is not reasonable. Do not calculate short term exposure scenario (e.g., 1 day) criteria where only chronic toxicity input factors are available. Sub-chronic toxicity values should be used for the calculation of criteria for hazardous substances that cause developmental effects from sub-chronic exposure. If an exposure unit has been defined for a facility, then averaging should be allowed for samples representing the exposure unit. *10-18-2016*: Comment resubmitted	exposure to many hazardous substances shows that a single exposure during a critical window of development can cause irreversible adverse outcomes for those offspring. USEPA guidance and USEPA risk assessment practice for developmental toxicity and prenatal exposure is for a single event or acute exposure scenario, unless the adverse effect is only altered growth. The single event or acute exposure scenario use is consistent with recent (2015) USEPA guidance for TCE exposure related to vapor intrusion, and with USEPA risk assessments for exposures to TCE (2014) and n-methylpyrrolidone (2015) conducted under the Toxic Substance and Control Act. The DEQ has agreed to remove the prohibition for statistical approaches to further evaluate individual exposure pathways and scenarios for hazardous substances with criteria based on developmental toxicity. This further evaluation will include spatial considerations with regard to the appropriateness of statistical approaches for these single event or acute exposure scenarios.	
49	(1) (DD)	CHAMBER	The proposed rules identify additional chemicals as developmental toxicants, establish equations to calculate criteria for developmental effects for all exposure pathways (versus only soil direct contact), and add a requirement for point by point comparison of site data to criteria. Significant differences exist between the proposed Part 201 process and practices of the USEPA and other Region 5 states. The current 2013 criteria based on developmental effects should be maintained, except were IRIS is being used and IRIS did not identify a chemical as a developmental toxicant and where DEQ has removed the chemical from its proposed list of developmental toxicants. Changes to criteria based on developmental effects should not be promulgated until the proposed process for developmental toxicants and effects can be evaluated.	The DEQ does not agree that an inconsistent approach be used to address developmental toxicity as proposed by this comment as that would not be clear and transparent and not adequately protect public health and protect for the most sensitive adverse effect required by the act. USEPA and other agencies often identify developmental toxicity as the most sensitive noncancer endpoint for a chemical and use that value to protect for all exposure durations and that most sensitive endpoint. Cleanup criteria developed pursuant to Part 201 (20a(4)) must be protective of the most sensitive endpoint. USEPA and other states do not single out developmental endpoints because all residential criteria are based	None

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			Additional time is required to review the process used to identify developmental toxicants and verify relevant toxicity inputs are used in the criteria algorithms. The reference in footnote DD to the new requirement for point by point comparison of site data to criteria and the related table/list of chemicals should be removed. Statistical comparison of site data to criteria protective of developmental effects may be appropriate for some exposure pathways. Revise proposed footnote DD to remove the "point by point" data comparison for compliance purposes and delete the substance list entitled "Categorization of the Developmental Toxicants." Add text describing the use of this scenario requires that the chemical be known to produce an adverse developmental effect and the published toxicological evaluation includes a short term toxicological value to derive the criteria.	on a child receptor (and the driver receptor for almost all exposure pathways). The CSA agreed with the process previously used by the DEQ. The only difference with the new process is that it is consistently applied for all hazardous substances, and allows for a less stringent prenatal exposure consideration (full term pregnancy) when the developmental toxicity is only altered growth. This approach is consistent with recent developmental toxicity risk assessments under TSCA (trichloroethylene, 2014; n-methylpyrrolidone, 2015) There has been an extensive public comment period for these criteria rules that has included documentation of this process and multiple meetings to answer questions for MMA representatives specific to this process. The DEQ has removed from Rule 49(1)(DD) the prohibition for statistical approaches to allow for further evaluation of individual exposure pathways and scenarios for hazardous substances with criteria based on developmental toxicity. This further evaluation will include spatial considerations with regard to the appropriateness of statistical approaches for these acute exposure scenarios.	
		BARR	*9-13-2016*: Sub-chronic toxicity values should be used for calculation of criteria for hazardous substances that cause developmental effects from sub-chronic exposure. An uncertainty factor is typically applied to chronic toxicity values to account for sub-chronic exposures in test animals thereby making a sub-chronic exposure applicable to a chronic exposure scenario. Based on Rule 50, the DEQ only lists the chronic toxicity value in the tables, did the DEQ review the toxicity studies and remove any uncertainty factors applied to the chronic toxicity values? Can the DEQ state how sub-chronic exposures were	The noncancer toxicity values used with the child and pregnant women receptor equations are all based on developmental toxicity. Consistent with risk assessment guidance for this type of endpoint, a subchronic to chronic uncertainty factor was not used for these toxicity values. For a few that the reference source applied a subchronic to chronic uncertainty factor the DEQ removed that uncertainty factor from the noncancer toxicity value prior to use in the early life receptor equations.	None

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			accounted for? *10-18-2016*: Comment resubmitted	The DEQ has removed from Rule 49(1)(DD) the prohibition for statistical approaches to allow for further evaluation of individual exposure pathways and scenarios for hazardous substances with criteria based on developmental toxicity. This further evaluation will include spatial considerations with regard to the appropriateness of statistical approaches for these single event or acute exposure scenarios.	
			9-13-2016: If an exposure unit has been defined for a facility and approved by the DEQ then averaging should be allowed for samples representing an exposure unit. 10-18-2016: Comment resubmitted		
49	(1)(KK)	SONS	Typo identified as follows: Hazardous substance may exhibit the characteristic of toxicity as defined **as defined** under part 111 of the act in R 299.9212(4).	Subrule was corrected in response to this comment	Rule 49(1)(KK)
49	(1)(OO)	MMA MOHR	Definition of volatile for miscible compounds (especially 1,4-dioxane). Assert 1,4-dioxane should not be classified as a volatile compound and is very unlikely to be detected in soil gas surveys above groundwater contaminated with 1,4-dioxane. This conclusion applies to the groundwater in contact vapor intrusion scenario.	Footnote (OO) no longer addresses the hazardous substances where available information indicates it is or may become volatile. See response to comments for Rule 2(k) regarding the revision of the definition of "volatile" hazardous substances. The USEPA identifies 1,4-dioxane as a volatile substance because its vapor pressure is greater than or equal to 1 mmHg. The DEQ identified that 1,4-dioxane's vapor pressure is 38.1 mmHg, which classifies it as a volatile using USEPA's definition as adopted by the DEQ. The USEPA VISL calculator includes 1,4-dioxane and provides screening levels. The DEQ has empirical evidence of 1,4-dioxane detection in soil gas samples.	Rule 2(k)
49	(1)(QQ)	MMA	Proposed subrule (1)(QQ) language provided for replacement of IRIS toxicity values when IRIS adopts a final value.	This proposal was inconsistent with the APA and the rules were not modified to include the proposal.	None
		CHAMBER	Consistent with the intent of the CSA to develop a process to update the Part 201 criteria in a timely manner and to use the "best available, soundest scientific information", the regulated community could support the automatic adoptions of new final IRIS determinations.		
49	(1)(QQ)	MMA	*10-18-2016*: Footnote QQ has been added without sufficient explanation and basis as to its need, construction, and application. In addition, some of the	This Footnote is now Rule 49(1) Footnote (EE) and Footnote (FF) The DEQ understands that chronic exposure	Rule 49(1) Footnote (EE)

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			AAC values proposed in the footnote do not appear consistent with the sources cited in the footnote. The DEQ must first clearly address these deficiencies so that the intent and application can be more fully evaluated. The intent of this footnote is not clear and the proposed footnote QQ does little to explain its purpose. Specifically, the footnote applies only to four chemicals where the Tier 1 Vapor Intrusion screening levels are listed in Table 4 of Rule 46(4). However, the DEQ has not explained why the respective AAC values for these substances, while adequate for all other exposures in the proposed rules, are somehow inadequate for this exposure scenario. Before finalizing this proposed rule, the DEQ must better explain the intent of using these AAC values for these four compounds. The DEQ has verbally indicated that the proposed footnote was added to provide a basis for deciding if evacuation of an occupied building is warranted in the event of intrusion and buildup of significant vapor concentrations in that building. This application would be consistent with how acute and intermediate MRLs and acute RfCs may be used, and we understand that the state should be able to use such AACs to protect the public in the event of an emergency. However, these determinations should be made based on actual indoor air data and not on generically (and conservatively) modeled predictive values from soil or groundwater. In other words, such decisions should not be made using any of the vapor intrusion screening levels in Table 4 of Rule 46(4). Table 4 simply lists Tier 1 screening levels for substances in soil and groundwater that were derived using highly conservative hypothetical vapor intrusion scenarios that by design are expected to rarely occur, if at all. Thus, the screening levels in this table are irrelevant for assessing actual exposure of building occupants (because they are designed for a different purpose). Notwithstanding these concerns with the intent of the footnote, the actual AAC source references and the AAC values listed in the footnote lack clarity, do not always	typically results in adverse effects at lower concentrations than shorter-term exposure. There are, however, some hazardous substances with adverse effects at lower concentrations from shorter-term exposures that are not predicted or observed from longer-term animal studies. In the case of inhalation exposures, the shorter-term adverse effects are neurological and most are from adult human exposure studies. Together with DHHS toxicologists, DEQ evaluated a subset of volatile chemicals for adverse effects occurring at lower concentrations than seen with long-term exposure. For chemicals identified to have short-term toxicity effects, the AACs are determined using their short-term toxicity values. For residential exposures, these chemicals are: acetone, chlordane, ethanol, tetrachloroethylene, toluene, and 1,1,1-trichlorethane. For nonresidential, they are: acetone, ammonia, chlordane, trans-1,2-dichloroethylene, ethanol, tetrachloroethylene, toluene, and 1,1,1-trichloroethane. Modifications to the footnotes were made to reference the source. The sources of the acute or intermediate values that serve as the basis of the AACs are as follows: The **tetrachloroethylene** residential and nonresidential AACs are based on the ATSDR acute inhalation MRL with no adjustments other than conversion from ppm_{vol}. This value is based on adult human exposure studies demonstrating neurotoxicity (reaction time, cognitive, and color vision impairments). This value is lower than the calculated residential or nonresidential AAVs based on chronic toxicity values. The nonresidential criteria that result from this AAC may be adjusted for a 12-hour work day for generic use pursuant to the provisions of Rule 26(10) and Rule 27(17) and	

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			reflect the purported values and appear to be internally inconsistent. Further documentation, specification and corrections would be needed if the DEQ seeks to further consider this new requirement. First, the sources of the values in the footnote table are not clearly established for each of the specified compounds. This lack of a reference makes it very difficult to understand the actual source of the values listed, and to compare the basis of the AAC value derivation in the reference source to the DEQ's application in these rules. Without a clear understanding of the AAC value derivation, it is difficult for the DEQ to demonstrate that the values were properly selected. MMA attempted to confirm these values and sources as described in the footnote but we could not. For example, the footnote QQ text and the AAC values in the table do not appear to be entirely consistent with each other. The text says the AAC are either acute/intermediate MRLs or acute RfCs from IRIS. But some of the residential AACs in the table do not appear to be these types of MRLs or RfCs. The toluene residential AAC of 5,200 ug/m3, for example, does not appear to be the acute MRL of 2 ppmv (7,500 ug/m3), no intermediate MRL is available, and IRIS has not published an acute RfC. Also, the 1,1,1-TCA residential AAC of5,000 ug/m3 does not appear to be the acute or intermediate MRL of 2 and 0.7 ppmv (10,900 and 3,800 ug/m3). The AAC for 1,1,1-TCA is also below the range of the acute RfCs in IRIS which is from 6,000 to 9,000 ug/m3. In the example of 1,1,1-TCA, and other compounds where multiple values from ATSDR and IRIS exist, we question the rationale the DEQ is using to select the residential AAC. In the case of 1,1,1-TCA, the choice seems arbitrary. The DEQ's basis for deriving the nonresidential AACs is also unclear. For example, the 1,1,1-TCA nonresidential AAC of 7,000 ug/m3 appears to be the residential AAC multiplied by 7/5 to account for a 5-day work week. The same adjustment appears to have been made in derivation of the MTBE nonresidential AAC. However, a different adjustment was made for toluene, and no	ATSDR (2016) guidance. The **toluene** nonresidential AAC is the ATSDR acute inhalation MRL converted from ppm_{vol}. This MRL is based on statistically significant cognitive impairments (3 out of 6 measured, with 1 additional impairment near significant) in adult human subjects with a history of solvent exposure and adverse reactions to toluene. Since the exposure period from the study was 20 minutes, no additional adjustments are appropriate for a work day. The **1,1,1-trichloroethane** residential AAC is the short-term RfC from USEPA IRIS. This value is also identified as the IRIS subchronic and chronic RfCs as the values based on subchronic and chronic rodent studies would be higher, so USEPA defaulted to the lower short-term value to be adequately protective of these short-term effects. The adverse effects are identified as neurobehavioral with the most sensitive being reaction time from short-term controlled adult human studies and adjusted using a physiologically-based pharmacokinetic (PBPK) model for the effective peak blood concentration at steady-state. The 1,1,1-trichloroethane nonresidential AAC is the 8-hour RfC from USEPA IRIS based on the same study and PBPK model predicting the effective blood concentration after 8 hours of exposure. Since this nonresidential AAC is based on an 8-hour exposure period, no additional adjustments are appropriate for a work day. The residential AAC for **ammonia** is based on the IRIS RfC. This was not chosen for the basis of the nonresidential AAC because the ATSDR acute inhalation MRL is lower. The nonresidential acute MRL is based on a study of 16 human volunteers exposed to 50, 80, 110, and 140 ppm	

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			adjustment was made for PCE. Taken together, these adjustments and non-adjustment seem arbitrary. Finally, as stated elsewhere in these comments, the DEQ should not use draft toxicity values for this assessment, if it determines to finalize these rules with Footnote QQ in Rule 49(1). Recommended Action: Prior to finalizing Rule 49 (1) (QQ),), the DEQ must explain the basis as to its need, construction, and application. In addition, the DEQ should correct the apparent errors and inconsistencies as well as avoiding the use of draft toxicity values as noted herein, and most importantly, clarify that these acute/intermediate AAC are not suitable for and not to be used in deriving generic soil and groundwater vapor intrusion criteria from hypothetical, long-term vapor intrusion scenarios. If these acute/intermediate AACs are intended for addressing immediate abatement of occupied buildings using actual indoor air data, it is unclear why these special AACs are needed in the Part 201 rules. In particular, the Department of Public Health and Human Services has responsibility and authority for making decisions on building evacuations, and its choice of AACs has no bearing on the choice of AACs that should be used for derivation of generic soil and groundwater vapor intrusion screening levels or criteria.	ammonia for up to two hours (Verberk, 1977). Subjects were surveyed for sensitivity to ammonia every 15 minutes, and 50 ppm was identified as the LOAEL where eye, nose and throat irritation and general discomfort were considered the critical effects. There is a DEQ acute ITSL also based on acute respiratory irritation. The acute ITSL should be considered for building occupants that complain of respiratory irritation. Since this nonresidential AAC is based on a 2-hour exposure period, no additional adjustments are appropriate for a work day. The **acetone** residential and nonresidential AACs are based on the ATSDR intermediate inhalation MRL of 31,000 µg/m^3 with no adjustments other than conversion from ppmvol. This value is based on a study of humans exposed to acetone for four weeks or less. Changes in the visual evoked response, a measure of neurological effects, were reported after five hours of exposure. Since the toxicity endpoint was not adjusted to a continuous exposure, no additional adjustments are appropriate for a work day. The basis of the **chlordane** residential and nonresidential AACs is the ATSDR intermediate inhalation MRL. The intermediate inhalation MRL is based on hepatic effects (centrilobular hypertrophy, hepatocellular vacuolization, increased P450, decreased albumin, decreased albumin/globulin ratio) following exposure to chlordane for 90 days (5 days a week for 8 hours a day). The intermediate inhalation MRL is a more protective value than AACs calculated with a U.S. EPA IRIS RfC or IURF. It should be noted that the RfC is based on the same study selected by	

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				ATSDR. The NOAEL selected by ATSDR is the lowest exposure group, 0.1 mg/m^3, while the U.S. EPA RfC is based on a NOAEL of 1.0 mg/m^3. The **ethanol** residential and nonresidential AACs are based on the MDEQ ITSL. The MDEQ ITSL is based on the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV). With an adjustment for an eight hour averaging time, the ITSL is 19,000 µg/m^3. This value is based on worker complaints of irritation to the eyes and respiratory tract. Based on a comparison with human oral data (NOAEL of 1 ounce of ethanol [23.3 grams per day]), this is also considered protective against the most sensitive human endpoint, fetal alcohol syndrome. The nonresidential AAC for **trans-1,2-dichlorethylene** is based on the acute inhalation MRL of 790 µg/m^3. The acute MRL is the same value as the intermediate MRL. The acute MRL is based on an 8 hour inhalation study in female rats in which fatty degeneration (steatosis) of the hepatic lobules was observed (ATSDR, 1996; Freundt et al., 1977). Since this nonresidential AAC is based on an 8-hour exposure period, no additional adjustments are appropriate for a work day.	
50	(5) & (6)	KAYLOR	A typo for ATSDR exists in the RFd Source for Polybrominated biphenyls.	On 9-29-2016 this rule was corrected.	No further revisions required.
50		MMA	The DEQ appears to have selected USEPAs EPI Suite as the exclusive source of measured or modelled values for most physical and chemical parameters used to calculate criteria. The CSA recommended that EPI suite and USEPA's SSG values for each chemical be evaluated to determine which reflects the best science, the DEQ's use is in conflict with the recommendation. The robust selection process of the SSG appears to still represent the	The DEQ's selection of chemical-physical data using the USEPA's EPI Suite application is supported by CSA recommendation 1.1 and is consistent with the data selection processes of the USEPA and USEPA Region 5 states. The EPI Suite application represents a robust and comprehensive data source that has undergone independent review by the EPA's Science Advisory Board, been validated in peer-	None

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			best available science. The SSG evaluated a suite of experimentally measured values from different researchers and generally recommended central tendency estimates from the suite of those parameters. The measured values from EPI Suite provide a less scientifically valid approach to selecting amongst the same experimentally measured values than the approach exhibited by SSG and used in the current rules. USEPA's Science Advisory Board has indicated a number of concerns with the program, but that it was "adequate to support Agency screening level decision-making", i.e., not cleanup decisions. If the DEQ chooses to select a particular experimentally derived value from EPI Suite, when compared to SSG, it should state the basis for selection and vice versa.	reviewed publications, and is regularly updated. The USEPA's 1996 Soil Screening Guidance (SSG) Technical Background Document indicates that with the exception of values for air diffusivity, water diffusivity, and certain Koc values, all of the values used in the development of Soil Screening Levels (SSLs) can be found in the USEPA's Superfund Chemical Data Matrix (SCDM) and that the user should consult the most recent version of the SCDM to ensure that the values are up to date. The most current versions of SCDM identify the PhysProp database and the EPI Suite application as the preferred sources of most chemical-physical data, with experimentally derived data generally preferred over modeled/estimated data. The PhysProp database is embedded within the EPI Suite application. The chemical-physical data presented in the SSG compliment and supplement the EPI Suite/PhysProp data. For some parameters, such as ionizing Koc and inorganic Kd values, the SSG was the only reference source identified that reported these data and was exclusively used. Air and water diffusivity data were calculated using the equations presented in the USEPA's Water9 model consistent with CSA recommendation 1.1.	
50	(7) Table 1 Sulfolane	ECT	The following presents residential and non-residential cleanup criteria for soil and groundwater for the chemical sulfolane, calculated using current best available data via an oral reference dose (RfD) of 0.01 mg/kg-day. Recently proposed DEQ-RRD groundwater cleanup criteria for sulfolane appear to have been calculated using equation 3 (residential, non-carcinogenic effects) and equation 9 (non-residential, non-carcinogen effects) from proposed Rule R299.10. Furthermore, the groundwater cleanup criteria appear to have been calculated utilizing an oral reference dose (RfD) of 0.001 mg/kg-day, obtained from the USEPA 2012a provisional peer review case study.	The DEQ identified the 2012 USEPA PPRTV RfD as the best available value using the agreed to toxicity value decision framework presented in CSA recommendation 1.1. The decision making process is outlined in the sulfolane chemical update worksheet published by the DEQ. While an independent scientific body such as TERA is not represented in the CSA toxicity value decision framework as an acceptable information source, other state environmental and/or public health agencies including MDEQ are allowed as sources of an "other state value" for consideration in	None

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			The groundwater cleanup criteria for sulfolane presented herein were calculated utilizing an RfD of 0.01 mg/kg-day, obtained from the Thompson et al., 2013 case study. The RfD from each of the sulfolane toxicological case studies were evaluated by an expert peer review panel (referenced on page 2) that recommended the RfD from the Thompson et al., 2013 case study for use in computing risk-based cleanup criteria. A recently published document has proven valuable in summarizing the toxicology studies that have been used to develop an RfD for sulfolane. The document, published in December 2014 by the independent organization Toxicology Excellence for Risk Assessment (TERA), presents a detailed analysis of eight foregoing studies that determined an RfD for sulfolane. Based on an expert peer review of the eight source case studies, TERA recommended an RfD of 0.01 mg/kg-day from the Thompson et al., 2013 case study for use in computing risk-based cleanup criteria. If the TERA-recommended RfD of 0.01 mg/kg-day from the Thompson et al., 2013 case study is used in the DWC calculation, the resulting values are 61 and 189 µg/L, respectively, for residential and non-residential groundwater ingestion exposure. The Residential and Non-Residential Drinking Water Protection Criteria (DWPC) for sulfolane proposed by DEQ-RRD were calculated by multiplying the DWC (groundwater) values by 20 (or defaulting to the target detection level (TDL)), per DEQ-RRD proposed Rule R299.22. Accordingly, the DWC for groundwater (calculated above) using the RfD from the Thompson et al., 2013 case study result in DWPC values of 1,220 and 3,780 µg/kg, respectively, for residential and non-residential soil contaminants leaching to groundwater criteria. The conclusions from the expert peer review presented in the TERA report recommended the RfD from the Thompson et al., 2013 case study which results in DWC (groundwater) values of 61 and 189 µg/L, respectively, for residential and nonresidential groundwater ingestion exposure. Accordingly, multiplying the DWC	determining the best available value when values from Tier 1 and 2 sources (IRIS, PPRTV, ATSDR) are not available. As the commenter referenced, TERA developed an RfD for sulfolane in 2014 for the Alaska Department of Environmental Conservation (ADEC). To date, ADEC has no cleanup level in effect for sulfolane. Further, ADEC states in an August 2015 Sulfolane Investigation Update newsletter that it's "current stance is to wait to set a cleanup level for sulfolane until more data are available from the new NTP [National Toxicology Program] studies, in order to protect people from exposures". A September 29, 2016 statement from the Alaska Department of Health and Social Services goes on to state, "We hope to gain a better understanding of sulfolane's toxicity in the next 4-5 years, as the federal National Toxicology Program is currently conducting animal studies to evaluate the short- and longer term health effects of sulfolane". So, to date, the state of Alaska has not accepted the RfD developed by TERA for use in the development of any cleanup levels for sulfolane. Therefore, the TERA-developed RfD is not consistent with any toxicity value source presented in CSA recommendation 1.1 and the TERA RfD cannot be considered for development of the generic Part 201 cleanup criteria. 2015 Sulfolane Investigation Update: https://dec.alaska.gov/spar/csp/sites/north-pole-refinery/docs/newsletters/sulfolane-update-8-2015.pdf 2016 Alaska Department of Health and Social Services statement: https://dec.alaska.gov/	

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			values by 20, per DEQ-RRD proposed Rule R299.22 (consistent with the DEQ-RRD proposed DWP criterion), results in DWPC (soil) values of 1,220 and 3,780 µg/Kg, respectively, for residential and nonresidential soil contaminants leaching to groundwater criteria. The current best available data indicates the DEQ-RRD Residential and Non-Residential DWC and DWPC for sulfolane presented herein should be adopted into statute.		
50	(7) Table 1 Trichloroethene	ARCADIS	*9-13-2016*: Trichloroethene DEQ relies on the USEPA chronic inhalation RfC to derive criteria based on a single exposure. While USEPA has based interim action levels on the chronic RfC, it is inappropriate to derive chronic exposure criteria based on the interim action levels. Looking only at the inhalation toxicity value, it was derived using three studies (two primary and one supplemental) with different endpoints. One, a study by Johnson et al. (2003), found that short term exposures to trichloroethene (TCE) could result in fetal heart malformations (FMHs) in developing fetuses. Unfortunately, the Johnson et al. (2003) study results are controversial in that the study reported a potential causal link between TCE ingestion in pregnant female test animals and an increased prevalence in FMHs. Reliance on the developmental study hypothesizes that TCE at a very high dose level may induce deleterious effects following short-term exposures. It is this conclusion that DEQ has relied upon, being overly cautious in their approach due to a concern that a single maternal exposure to TCE at just the wrong time of fetal development could result in lasting adverse effects in offspring. No other RfC or oral RfD that is based on a developmental toxicity study has been applied in this manner. The reliance by USEPA and DEQ on the Johnson et al. (2003) study does not follow USEPA (1991; 1998) or international developmental toxicity guidance (OECD, 2001). Several weight-of-evidence evaluations and a causality evaluation concludes that the laboratory and epidemiologic data do not support a causal link between	The weight of scientific evidence for prenatal exposure to many hazardous substances is that a single exposure during a critical window of development can cause irreversible adverse outcomes for those offspring. USEPA guidance and USEPA risk assessment practice for developmental toxicity and prenatal exposure is for a single event or acute exposure scenario, unless the adverse effect is only altered growth. The single event or acute exposure scenario use is consistent with recent (2015) USEPA guidance for trichloroethylene (TCE) exposure related to vapor intrusion, and with USEPA risk assessments for exposures to TCE (2014) and n-methylpyrrolidone (2015) conducted under the Toxic Substance and Control Act (see more below). TCE is considered a developmental toxicant by DEQ as the RfC is based on critical effects that include increased cardiac malformations from prenatal exposure. The DEQ used the USEPA IRIS RfC (2.0 µg/m3) that is based on two rodent studies, one of which is a developmental study where pregnant female rats exposed to TCE in drinking water during gestation resulted in fetal cardiac malformations (USEPA, 2011). IRIS is DEQ's primary source of toxicity value unless better information is available from ATSDR or USEPA PPRTV. The ATSDR intermediate and chronic inhalation toxicity values or minimal risk levels (MRLs) are both 2 µg/m3 also and based on the same studies and endpoints used	None

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			maternal exposure to TCE and FHMs. Two high quality, guidance-based studies, designed to replicate the findings reported in Johnson et al. (2003), have shown no relationship between maternal TCE exposure via drinking water or inhalation and rates of FHMs. Therefore, reliance upon the results of the Johnson et al. (2003) study to derive an RfC, which is then used by DEQ to derive their criteria, is overly conservative because the RfC is not supported by the underlying science. Human epidemiological studies indicate that the results of the Johnson et al. (2003) study are not reflective of observations in humans. In fact, there are no data demonstrating that TCE exposure in the general population causes increased risk of cardiac defects in infants of exposed women. Furthermore, Ruckart et al. (2013) and Bove et al. (1992, 1995) found that TCE exposure was not associated with total heart defects and thus the heart defects seen in either study were not caused by TCE. Arcadis recommends the use of the RfC to develop a chronic criterion rather than a single-exposure criterion. *10-18-2016*: Comment resubmitted	by IRIS. The DEQ Air Quality Division (AQD) has established an initial threshold screening level (ITSL) for TCE that is consistent with the USEPA RfC with a 24 hour averaging time. DEQ considers the IRIS RfC value as the best available information. Please see USEPA's IRIS Toxicological Review of Trichloroethylene (2011) https://www.epa.gov/iris/supporting-documents-trichloroethylene and TSCA workplan risk assessment for TCE (2014) with link below for more information related to weight of evidence for fetal heart malformations. The DEQs use of the IRIS RfC is consistent with multiple USEPA guidance (see response to MMA comment Rule 49(O) above).and recent TSCA work plan chemical risk assessments including for trichloroethylene (see links below). TSCA Work Plan Chemical Risk Assessment Trichloroethylene: Degreasing, Spot Cleaning and Arts & Crafts Uses [See section 2.6.2.3.6 and Appendix N.] https://www.epa.gov/sites/production/files/2015-09/documents/tce_opptworkplanchemra_final_062414.pdf Also consistent with another recent TSCA evaluation for n-methylpyrrolidone https://www.epa.gov/sites/production/files/2015-11/documents/nmp_ra_3_23_15_final.pdf	

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50	(7) Table 1 Benzo(a)pyrene	MMA	Another readily apparent error we discovered earlier is the factor of 1,000 error due to MDEQ's failure to use correct units for a toxicity value for benzo(a)pyrene. This was an error that the DEQ uncovered only after multiple questions were raised by our consultants about that criteria. That error would have driven the soil cleanup level of benzo(a)pyrene, which is a commonly detected compound throughout the state, down to the detection limit. This would have had the effect of making many, many more properties in the state appear to be Part 201 facilities when in fact it was a simply careless mistake by the DEQ.	On 9-29-2016 revisions were made in this table and the Rule 46 criteria tables in response to this comment.	No further rule revision is required.
50	(7) Table 1 Vanadium	AECOM	DEQ indicates a Tier 1 Source is not available and cites the PPRTV 2009 as a chronic RfD and the best available data, noting the more recent ATSDR 2012 document derived an intermediate (subchronic) but not chronic criterion. • An IRIS value Is available for vanadium and compounds. IRIS Is a ner 1Source and both DEQ and USEPA guidance recommend adhering to the toxicity Information hierarchy. As such,this value is preferred over the proposed PPRlV value. • The current IRIS value (5.04E-3) is in close agreement with the existing DEQ values derived by DEQ-CCD/RRD(S/22/2000} of SE-3 and by DEQ-CCD/WRD(7/22/2009} of 2.1E-3. The proposed value Is over 2 orders of magnitude more stringent. • The more recent ATSDR 2012 document reviews the PPRTV study being used as the basis for the proposed DEQ value and finds the data inadequate for deriving a chronic criterion. • Furthermore, ATSDR 2012 cites a subchronic study in humans that shows none of the effects observed in the proposed subchronic animal study at concentrations of 0.12mg/kg/day. Applying a factor of 10 to convert to a chronic estimate yields a value of 0.012,over 2X the IRIS value and over 170X the proposed value. • USEPA does not calculate a dermal specific factor for vanadium in the Regional Screening Levels consistent with the Risk Assessment Guidance for Dermal Exposure.	The PPRTV provisional RfD represents the best available science for vanadium and will be maintained. DEQ proposed the RfD of 7.0E-5 mg/kg-day (PPRTV, 2009) • The PPRTV chronic provisional RfD is based on a 6 month rat drinking water study (Boscolo et al., 1994) using sodium metavanadate. The DEQ RfD for the current criteria is also based on sodium metavanadate. • The critical effect for the PPRTV provisional RfD is kidney pathology including increased blood pressure, stimulation of the reninangiotensin-aldosterone system, and kidney histopathology. DEQ determined that the PPRTV is the best available science without consideration of the IRIS file for vanadium pentoxide (no IRIS files for vanadium based on vanadium metavanadate are available). However, even if considered, the IRIS file (1988) on vanadium pentoxide does not represent the best available science because more recent studies of vanadium compounds have been published and more recent assessments have been conducted documenting more sensitive effects. Additional reasons why the IRIS RfD for sodium pentoxide cannot be supported are presented in	None

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			DEQ should adopt the existing IRIS oral reference dose for vanadium and compounds, adhering to the existing toxicity information hierarchy outlined in USEPA and DEQ guidance. DEQ should follow existing USEPA guidance regarding dermal exposure and not conduct dermal evaluations for vanadium until additional information becomes available.	the following bullets: • The RfD is based on an unpublished study of poor quality conducted in 1953 (Stokinger et al., 1953). ▪ An unspecified number or rats were used in two dietary dose groups for 2.5 years ▪ No control group was used ▪ Growth rate, survival and hair cysteine content were the only effects monitored and the only effect noted was a decrease in the amount of cysteine in the hair of the test animals ▪ IRIS reports that confidence in the study, the database and the RfD are all low • Other better quality studies are available indicating toxicity to the kidney which is a more critical and sensitive effect than those examined in Stokinger et al. (1953). See the PPRTV RfD information noted above. The DEQ generates health-based dermal values for inorganics using a skin absorption efficiency (AEi) factor of 0.01 (1%), the default value in the current criteria. This assumes that fine Mn in soil may be absorbed through the skin in very small amount. The USEPA RSL does not have a skin absorption efficiency factor value at this time and therefore has not calculated dermal risk.	
50	(7) Table 1 Manganese	AECOM	DEQ calculates a dermal reference dose from an oral reference for manganese previously adjusted by a factor of three to account for uncertainties regarding manganese in the diet. • USEPA does not calculate a dermal specific factor for manganese in the Regional Screening Levels consistent with the Risk Assessment Guidance for Dermal Exposure. • US Department of Energy publishes a factor; however, the calculation differs from that of DEQ. Specifically, a dermal factor is calculated from the oral factor by multiplying by the GI absorption factor prior to dividing	The DEQ calculated the dermal component of the manganese soil direct contact health-based value consistent with USEPA RAGS-E dermal assessment guidance and the CSA Physical-Chemical Value Decision Framework. Specifically: 1) The DEQ calculated the dermal component of the soil direct contact health-based value (HBV) for Mn based on an assumed soil dermal absorption efficiency (AEd) value of 0.01 (1%), consistent with Rule 299.20(3)(b)(iv). The AEd value of 0.01 (1%)	None

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			the dose by the uncertainty factor of 3. • The proposed residential criterion should be 2E-7 rather than 1.2E-7. The proposed nonresidential criterion should be 6.3E-7 instead of 3.2E-7. DEQ should follow existing USEPA guidance regarding dermal exposure and not conduct dermal evaluation for manganese until additional information becomes available. If DEQ continues to include the dermal evaluation for manganese, the dermal reference dose for manganese should be calculated from the oral reference dose prior to the uncertainty adjustment of 3X, consistent with the method used by RAIS and the Department of Energy.	represents the default Part 201 AEd value for inorganic hazardous substances when chemical-specific data are not available. The USEPA has not identified a Mn-specific dermal absorption fraction in RAGS-E and has no default value for inorganics; therefore, no dermal RSL was calculated by USEPA. 2) The dermal component of the soil direct contact HBV is calculated using a dermal RfD estimate that is derived consistent with USEPA RAGS-E dermal assessment guidance (USEPA, 2004). The dermal RfD is estimated by multiplying the oral RfD by the chemical-specific gastrointestinal absorption efficiency value (ABSgi) for manganese, 0.04 (4%). This ABSgi value is presented on Exhibit 4-1 of RAGS-E (USEPA, 2004). 3) The DOE calculation will generate the same dermal RfD as the DEQ approach assuming both are using the same RfD and ABSgi values. The CSA Physical-Chemical Value Decision Framework and Recommendations do not consider the DOE as a primary source of toxicity information or equations for deriving generic Part 201 cleanup criteria.	
50	(7) Table 1	KCHD	On behalf of Kent County Health Department the criteria must consider ATSDR minimum risk level and the acute health effects of both PCE and TCE for the vapor intrusion pathway.	See response to comments for Rule 49(1)(QQ)	
		MDHHS-DEH	The MDHHs-Division of Environmental Health recommends that the Part 201 Rules include provisions that are protective of acute (less than 14 days) and intermediate (less than one year) exposures as well as chronic exposures. For example, tetrachloroethylene (PCE) has an ATSDR acute (less than 14 days of exposure) inhalation Minimal Risk Level (MRL) that is the same as the intermediate and chronic MRLs. For chemicals such as PCE, the public needs to be protected against breathing levels above protective screening levels, such as the acute		

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			or intermediate MRLs, for shorter exposure times as these exposure couple be as harmful to people's health as longer ones.		
50	(7) Table 1 Draft Toxicity Values	MMA	The CSA established guiding principles to rely on the best available, most sound scientific information and to be readily transparent. There is no place in the proposed rules where adherence to this principle is more important than in the selection of the most appropriate toxicological values and classifications to be used in generating the generic cleanup criteria and screening levels. The CSA included in its recommendations to the DEQ, which they accepted, a tiered system for selecting between various available toxicological data based on the nature of the specific development and scientific review process employed by the sources. The first tier in this system, USEPA's Integrated Risk Information System (IRIS), uses information created by a group of toxicological experts. During the development of these toxicity values drafts are distributed to other independent experts for their review and input, often times leading to significant changes or even scrapping of the conclusions in the original draft. This specific process of seeking independent review and input is one of the more important elements in ensuring the use of the best available science and soundest scientific information that the CSA and all of us believe the rules should be based on. Nowhere in the accepted CSA tiered system does it include the use of draft (i.e., non- final) values. MDEQ, though, has not followed these important CSA principles and has not faithfully followed the tier system that they themselves agreed to because they have included draft toxicity values and classifications. Such draft values have not completed the peer review process or received regulatory approval and are thus not settled science. In fact, the DEQ has preferentially included a number of draft toxicity values and cancer classifications for such chemicals as benzo a pyrene (BAP), various trimethylbenzenes (TMB) and hexavalent Chromium (Cr	The DEQ implemented the CSA recommended tiered toxicity value decision framework for selection of chemical-specific toxicity data used in calculating the generic cleanup criteria. The framework requires the user to address whether the toxicity value identified from the reference source(s) of a given tier represents "the best available value" for that hazardous substance. The only way that this requirement can be achieved and the best available value identified for a hazardous substance is through cross-evaluation of the toxicity values identified from all tiers for that substance. As the commenter noted, there are instances in which the DEQ identified that a higher tier reference source did not yield the best available toxicity value for a hazardous substance. The DEQ has transparently identified in the published chemical update worksheets the underlying decisions that went into selection of all toxicity values. All toxicity values previously identified in Table 1 of Rule 50(7) that were based on draft toxicity evaluations have been replaced in accordance with the CSA toxicity value decision framework using only toxicity values supported by finalized toxicity evaluations.	

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			VI) and several others. The DEQ, by this action, has taken the carefully thought out tier system of the CSA and flipped it on its head by concluding that if a toxicological source proposes a new value or classification, that proposal will supersede any finalized values and determinations from all other sources on the tier system, even though that draft value has not completed its independent peer review process and is subject to considerable change in that process. The DEQ fails to recognize that draft values and classifications are not settled science. The peer review processes employed by these source agencies routinely results in changes or rejects the original draft values based on the strength of the science employed and the available data. For example, the draft toxicological assessment for hexavalent chromium by IRIS went through most of the peer review and approval process only to be sent back to the initial steps of seeking input, based on the questions and comments they received. BAP is in the midst of its peer review process, which has faced a high amount of scrutiny, both inside and outside of USEPA, for its use of a novel approach. The IRIS assessments for the three most common trimethylbenzene isomers was recently finalized (and made available on Friday September 9, 2016) and those values deviated from the most recent draft values. Previously, IRIS went through several different drafts in assessing perchloroethylene (PCE) and trichloroethylene (TCE) before finalizing values that were quite different from the initial drafts. So, it Recommended Action: The proposed rules should not use draft toxicity values, classifications or other preliminary determinations because such preliminary work is currently under scientific and/or regulatory review, lacks scientific consensus, and as such, does not represent “the best available, soundest scientific information”, as specified in the guiding principles of the CSA. Furthermore, the use of such draft information is in direct conflict with the tier system that was recommended by the CSA and accepted by the DEQ. Instead of using draft values and preliminary		

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			classifications, the rules should include a provision for allowing timely adoption of new final toxicity values, classifications and other determinations once they become finalized by a regulatory agency. Such an approach would be consistent with the CSA and TAG 1 Recommendation 1.12.		
		CONSUMERS	*9-13-2016*: The proposed use of draft toxicity values and cancer classifications from primary sources such as IRIS, e.g., BAP, TMB RfD, Cr VI SF, does not meet the standard of best science set by the CSA. "Draft" values by nature indicate "sound science" has not yet been established and "final" values can be quite different e.g., TCE, PCE. We recommend that the use of all draft data be removed from the rules package. *10-18-2016*: Comment resubmitted		
		CHAMBER	Draft toxicity values and determinations regardless as to the source, should not be used for derivation of screening or cleanup criteria because they represent unsettled science, and neither USEPA nor other Region 5 states rely on draft toxicity values in developing published generic criteria or screening levels. Revise Toxicity Data Table. Use Final IRIA values and determination, including toxicity values, classifications and conclusions that insufficient data are available to derive a value.		
		ARCADIS	*9-13-2016*: DEQ proposes using draft toxicity values available from the USEPA's IRIS program that are in various stages of review. The DEQ proposes to use the USEPA's draft toxicity values. In cases where the USEPA draft toxicity assessment represented a more current and thorough review of the available toxicity literature than what was previously used in the DEQ program the new draft toxicity values were used. The draft toxicity values are not currently distinguished as such in the proposed toxicity value table. It is also unclear if DEQ plans to update draft toxicity information once USEPA IRIS concludes their review process (which includes addressing comments from stakeholders). DEQ is therefore setting the program up to be potentially obsolete even before it is adopted.		

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			One of the draft toxicity values proposed for use is the controversial dermal slope factor for benzo(a)pyrene, presented in the 2014 External Review Draft Toxicological Review of Benzo[a]pyrene ("draft Toxicological Review"; USEPA 2014). This would be the first instance that USEPA has developed a constituent specific dermal toxicity value. Since this draft dermal slope factor has not been adopted by USEPA nor is it a given that it will be adopted by USEPA, it is incumbent upon the DEQ not to base these proposed criteria on toxicity values that may never become part of the benzo(a)pyrene IRIS file. The DEQ should not base the proposed revisions to the Part 201 criteria on draft toxicity values. *10-18-2016*: DEQ continues to propose using draft toxicity values available from the USEPA's IRIS program that are in various stages of review. Typically, regulatory agencies, including USEPA Region 5, rely on final IRIS toxicity values. Use of USEPA draft toxicity values introduces unnecessary uncertainties into the development of the Part 201 criteria. DEQ does not distinguish between draft and final toxicity values in Table 1. The proposed regulation does not indicate the process that will be used if and/or when draft toxicity values are finalized. This lack of transparency should be corrected. In addition, it is recommended that draft toxicity values not be used in the development of the Part 201 criteria as these toxicity values may never be finalized or may be revised prior to finalization. DEQ is therefore setting the program up to be potentially obsolete even before it is adopted.		
50	(7) Table 1 Tiered Toxicity Values Decision Framework	MMA	The CSA recommended, and the DEQ agreed, to use a tiered approach, or a "decision framework" to select between various available toxicological data based on the nature of the specific development and review process employed by the sources. Simply put, the DEQ has not followed this tier process and has instead created some other hierarchy of their own making that is subjective, opaque, does not represent the best available science, and is inconsistent with the approaches employed by both	The DEQ implemented the CSA recommended tiered toxicity value decision framework for selection of chemical-specific toxicity data used in calculating the generic cleanup criteria. The framework requires the user to address whether the toxicity value identified from the reference source(s) of a given tier represents "the best available value" for that hazardous substance. The only way that this requirement can be achieved and	

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			USEPA and our surrounding states. In the CSA recommendation, the tiers were established to include what is generally recognized as the source with the best available scientific and peer review process at the top, with sources in descending tier ranked by the relative strengths of their processes for deriving toxicity values, cancer classifications and other determinations (e.g., where sufficient data were not available to calculate a value). IRIS occupies the top tier because its determinations are based on the highest level of scientific assessment, peer review and a rigorous public review and comment process. This process, which is robust and time consuming, is widely recognized as the standard of practice and was expected to be used preferentially by the DEQ in the rules. In the CSA hierarchy, IRIS determinations are followed in a tier occupied by those of PPRTV and ATSDR (Agency for Toxic Substances and Disease Registry), and then lower tiers contain lesser recognized sources such as those by other states and databases. USEPA has used a similar system for decades that has IRIS in the top tier, followed by PPRTV, and our surrounding states simply have adopted USEPA's hierarchy. However, the DEQ has deviated significantly from the CSA approach and those of USEPA and our neighboring states. Instead, for more than 70 chemicals in the proposed rules, the DEQ has rejected a final IRIS value or determination in favor of those derived from lower-tier toxicity assessments. The proposed toxicity table in Rule 50 is now a checkerboard of data taken from a multitude of sources other than the recognized leading source, IRIS. While the DEQ has deviated from the tier approach it embraced just last year, it has not provided a clear scientific and objective rationale for the deviation to the public. The CSA Guiding Principles state that "Any decisions to use the data from certain studies and not others … needs to rely on sound science and be transparent enough for an independent reviewer to readily determine how final values were developed." However, the proposed identification of chemicals as	the best available value identified for a hazardous substance is through cross-evaluation of the toxicity values identified from all tiers for that substance. As the commenter noted, there are instances in which the DEQ identified that a higher tier reference source did not yield the best available toxicity value for a hazardous substance. The DEQ has transparently identified in the published chemical update worksheets the underlying decisions that went into selection of all toxicity values. This was further discussed with the Phase II Stakeholder Process. The regulated community was asked to identify their priority chemicals and toxicity values that were of greatest concern to them. Fourteen hazardous substances were identified and recommendations were made as to which toxicity value they believed to be most appropriate. Their priority hazardous substances are: cis- and trans-1,2-DCE (RfCs); ethylbenzene (oral CSF and IURF); 1,1,2,2-tetrachloroethane (IURF); 1,2,4-trichlorobenzene (oral CSF); 2,4,5-trichlorophenol (RfD); hexachlorobenzene (RfD); hexachloroethane (IURF); 2-methoxyethanol (RfC); cadmium (RfD); chromium VI (oral CSF); nickel (RfD); and vanadium (RfD). The comment for 2-methoxyethanol was related to an error in the units of the RfC. The RfC was originally presented as 7.0E-4 $\mu g/m^3$. During review of the worksheet, it was discovered that the uncertainty factor was inappropriate and was reduced. The corrected RfC is 1.1E+0 $\mu g/m^3$. The comment for trans-1,2-dichloroethylene was a recommendation to not derive a RfC because IRIS does not present one. The RfC derived by ATSDR was maintained however, the additional uncertainty factor applied by the DEQ was reduced to a total UF of 3,000. The revised RfC is 2.6E+2	

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			human carcinogens, and the subsequent selection of toxicity values, lacks the transparency recommended by this Guiding Principle and in CSA Recommendation 1.12, and as such, limits the public's ability to understand MDEQ's rationale and to assess whether a proposed classification/value is appropriate. This is especially of concern when a proposed classification or toxicity value differs from that in IRIS and there is inadequate explanation for why a lower-tier classification or value represents better science than Tier 1. For this reason, it is not possible to determine to what degree CSA Recommendations 1.8 and 1.10 were followed. (Note: a clear example includes ethylbenzene, where the DEQ ignored the IRIS toxicity value and cancer classification, and instead used ATSDR and a state of California determination for cancer). Recommended Action: Final IRIS values, cancer classifications and other determinations should be used where they are available for a specific chemical. MMA has included a substitute for Rule 50 Table 1 Toxicological Values, utilizing the tier approach recommended by the CSA to preferentially use final IRIS determinations, as part of its formal written comments. (Appendices #1 and #2.) Regarding lower tier values on the table, MDEQ should provide, for each toxicity value proposed from a lower tier, a more transparent explanation (like an IRIS or PPRTV assessment summary document), including providing notice with opportunities for technical peer review of how MDEQ's independent evaluation concluded that such lower toxicity values are more appropriate. The DEQ must also consider the assessment method used by the source to ensure that the proposed lower tier values or determinations were derived from a robust scientific process with significant input from independent experts. MMA encourages the DEQ to reach out to other stakeholders, including MMA members and experienced practitioners, to participate in an engagement process in this task. Revisions to Table 1, and explanation have been provided.	µg/m^3; the original RfC was 8.0E+01. The comments for the remaining 12 hazardous substances were considered. The toxicity values originally recommended by the department were maintained because it is the department's professional opinion that they represent the best available science.	

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		CHAMBER	Final IRIS values and determinations are based on the highest level of scientific assessment, peer review and rigorous public review and comment process. USEPA and other Region 5 states rely on final IRIS values as the preferred toxicity data source in developing published generic criteria or screening values. These represent the best science/regulatory consensus, the standard of practice, and the preferred source in the tier system agreed to by the DEQ and CSA. Revise Toxicity Data Table. Use Final IRIS values and determination, including toxicity values, classifications and conclusions that insufficient data are available to derive a value.		
		WEC	*10-17-2016*: The CSA work group members made significant efforts towards identifying an appropriate methodology for calculating hazardous substance concentration criteria. That approach included deference to USEPA IRIS standards. In many cases, DEQ has ignored the IRIS standards for subjective reasons and, instead, adopted assumptions from scientific resources that do not have the same level of peer acceptance. Accordingly, the criteria for many hazardous substances appear to follow a rather subjective analysis by DEQ which does not conform to the agreed upon scientific principles. The agreed upon tiered evaluation process should be followed.		
50	(7)	MMA	Proposed revisions to toxicity values provided.	The DEQ implemented the CSA recommended tiered toxicity value decision framework for selection of chemical-specific toxicity data used in calculating the generic cleanup criteria. The framework requires the user to address whether the toxicity value identified from the reference source(s) of a given tier represents "the best available value" for that hazardous substance. The only way that this requirement can be achieved and the best available value identified for a hazardous substance is through cross-evaluation of the toxicity values identified from all tiers for that substance. As the commenter noted, there are instances in which the DEQ identified that a higher	

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				tier reference source did not yield the best available toxicity value for a hazardous substance. The DEQ has transparently identified in the published chemical update worksheets the underlying decisions that went into selection of all toxicity values.	
50	(7) Table 3	DOW	9-13-2016: DEQ's derivation of soil clean-up values for protection of migration to groundwater and GSlp pathways is inappropriate for TCDD and related compounds Currently, Michigan Part 201 does not include soil screening levels for TCDD for either the pathway of migration to groundwater or the GSlp pathway. TCDD was excluded from the original 201 criteria because it was correctly identified as "not likely to leach" ("NLL"), and this designation is supported by the literature. In the 2016 revisions to Part 201, DEQ derived new values for soil, stating an inappropriate need to protect both migration to groundwater (240 ppt) and the groundwater-surface water interface (GSlp) (80 ppt). This derivation is based on using USEPA's Soil Screening Level (SSL) Guidance formulas for partitioning from organic carbon content of soil and dilution in groundwater. In calculating these values DEQ used a modelled Koc instead of the more appropriate mean measured value of $2.45x10^7$. Using the appropriate measured value3 TCDD would be accurately characterized as a very hydrophobic compound that partitions into the organic content of soil and bioaccumulates within organisms. This is a very well-known characteristic of TCDD. In addition, DEQ's proposed approach incorrectly assumes that all congeners have the same physical chemistry as TCDD, when in fact, the other 16 dioxin / furan congeners have a higher degree of chlorination, and, as such, are even less mobile in the environment because as the number of chlorines increases, the solubility decreases, the volatility decreases, and the hydrophobicity increases. The migration potential is exaggerated not only due to the	The DEQ selected chemical-physical data for 2,3,7,8-TCDD consistent with CSA recommendation 1.1. The goal of this and other CSA recommendations was to increase transparency, consistency, and predictability in the chemical-physical data selection process for all Part 201 hazardous substances. Deviation from the CSA's data selection strategy for an individual hazardous substance would set precedent for all Part 201 hazardous substances and all chemical-physical parameters, thereby invalidating the goals of the CSA recommendations. The DEQ's Koc and Henry's law constant values for 2,3,7,8-TCDD are identical to those used by USEPA and USEPA Region 5 states. The DEQ publishes Part 201 cleanup criteria for 2,3,7,8-TCDD. For other congeners, the DEQ provides information in Footnote (O) for the application of toxicity equivalent factors consistent with USEPA methodology. MCL 324.20120b allows for the development of site-specific cleanup criteria. The DEQ no longer supports the use of "not likely to volatilize" or "not likely to leach" as non-numeric criteria. The DEQ's experience is that the "not likely to volatilize" identifier, which is currently based on the hazardous substance's Henry's law constant, is not adequately predictive of whether a hazardous substance may or may not be identified in soil vapor, indoor air, or ambient air. Volatilization-based cleanup criteria are therefore calculated	

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			use of the incorrect Koc, but also because DEQ reliance on the same physical/chemical properties of TCDD to model the environmental fate of the other 16 dioxin congeners. This also adds to the overestimation of the migration potential and results in extremely unrealistic conservative screening levels for the pathways of migration to groundwater and GSlp. Thus, DEQ's approach to derivation of criteria for these pathways is not supported by competent evidence. Recommended Action: For these reasons, the groundwater and GSlp pathways are not relevant for TCDD and associated dioxins and furans, which are very hydrophobic. Therefore the prior designation of NLL 'not likely to leach' is appropriate and should not be changed. *10-18-2016: Comments resubmitted with additional* - There is no new scientific information that forms the basis for making a change. In calculating these values DEQ used a modelled Koc instead of the more appropriate mean measured value of 2.45x107 liters per kilogram (L/kg) identified in the National Institutes of Health Hazardous Substances Data Bank (NIH HSDB) file4 The CSA emphasized the importance of using measured values over estimated values (see especially recommendation 1.8). Using the appropriate measured value, T CDD should continue to be characterized as "not likely to leach" as has been historically done by DEQ. The DEQ value for the Koc for TCDD of 2.491x105 L/kg is two orders of magnitude less than (more leachable than) and is inconsistent with the mean measured value cited in the NIH HSDB file of 2.4Sx107 L/kg. Recently, it has become apparent that linear relationships between Log Koc and Log Kow do not accurately predict Koc for compounds with a wide range of Kows, with "superhydrophobic" compounds (Log Kow > 6) presenting a particular challenge (UK Department of the Environment 1999,Baker et al 2000,Dueriet al 2008). In 2010,Chen et al. published a linear regression relationship derived specifically for dioxins and furans that showed a highly significant correlation (R=0.9521and p < 0.05) between log Kow and measured Log Koc for these compounds. This	where data are available to do so as described in the rules. The "not likely to leach" identifier in the current rules was generally based on inconsistent professional judgment that would not fulfill the DEQ's obligation to be transparent, consistent, and predictable. Soil leachate tests are a more appropriate indicator of whether or not a hazardous substance will leach from site soils. The DEQ determined that where the required data was available to calculate these groundwater protective criteria that the DEQ would do so for all hazardous substances. As part of the Phase II Stakeholder Process additional information for this comment was submitted to the DEQ for consideration. The DEQ determined that to better ensure harmonization with USEPA and other Region 5 states the DEQ should retain the DEQ proposed values. *Koc:* Experimentally derived Koc values for TCDD vary widely in the literature. The California Department of Toxic Substances Control (DTSC) identified a range of experimental Koc values from 5.75E+4 L/kg to 2.45E+7 L/kg available in the literature, nearly three orders of magnitude variability (DTSC, 1994). The Commenter's recommended Koc value for TCDD, 2.45E+7 L/kg, represents the extreme maximum of the experimental Koc value range reported in the scientific literature. Further, this Koc value was derived from soil samples contaminated "by oil spraying and industrial waste leakage". This suggests that the partition coefficients determined in this study may be specific to the unique contaminant mixtures present in the soils evaluated in this study and therefore unsuitable for application in the development of generic cleanup criteria for TCDD. The DEQ proposed an estimated Koc value of	

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			equation is: Log Koc = 4.078 + (0.4897 x Log Kow) Substituting the TCDD Log Kow of 6.8 (which is identified in both the DEQ Chemical Update Worksheet for TCDD and in the NIH HSDB file) in this new regression equation, this relationship predicts a Log Koc of 7.41or a Koc of 2.56x10 7 L/kg, which is very similar to the NIH HSDB mean measured value of 2.45x107 L/kg. Thus, both the mean measured value and the recently published, PCDD/F-specific linear regression equation that accounts for the highly hydrophobic nature of TCDD would lead to a Koc of 2.45x107 L/kg or higher. This underscores the fact that TCDD should be considered not likely to leach.	2.491E+5 L/kg derived using the USEPA's EPI Suite application, which is consistent with the USPEA RSLs and Region 5 states. This estimate is based on the scientifically accepted predictive relationship between a hazardous substance's octanol-water partition coefficient (Kow) and its Koc value. The California DTSC reports a range of experimentally-determined Log Kow values from 6.1 to 7.0, which is less than one order of magnitude variability as compared to the reported three orders of magnitude Koc value variability (DTSC, 1994). While the DEQ's proposed Koc value for TCDD represents an estimated value, the stronger consensus of experimental TCDD Kow values used to predict the Koc value warrants greater consideration in lieu of the highly variable experimental Koc values available. <u>*HLC*</u>: The Commenter has recommended that the DEQ adopt an HLC value of 3E-6 atm-m^3/mol for TCDD, which was derived using the scientifically accepted method for estimating HLC values based on the substance's vapor pressure and water solubility values. The Commenter's recommended HLC was derived using the same vapor pressure and water solubility values for TCDD that are presented in the USEPA Regional Screening Level (RSL) chemical-specific parameters table. This is the same methodology used by USEPA to develop the TCDD HLC presented in both the RSL table and the EPI Suite application (via the embedded PhysProp database). The USEPA, however, presents an HLC value of 5.0E-5 atm-m^3/mol for TCDD in both the RSL table and in EPI Suite. When contacted regarding this inconsistency, the USEPA indicated that the TCDD HLC presented in the RSL table was calculated using different vapor pressure and water solubility values (which were not identified) than	
		DOW	*9-13-2016*: DEQs derivation of soil clean-up levels to protect against migration to air is inappropriate for TCDD and related compounds Currently, Michigan Part 201 criteria do not include soil screening levels for TCDD for the pathway of migration to ambient air. TCDD was accurately excluded from the original 201 criteria because it was correctly identified as "not likely to volatilize" (NLV), and this designation is supported by the very low vapor pressure, low water solubility, and high hydrophobicity of TCDD and partitioning into organic matter.[4] In the 2016 revisions to Part 201, new values for both "infinite" (580 ppt to be applied where the vertical extent is not characterized) and "finite" sources (69,000 ppt for a 2 to 5 meter source thickness) are proposed. These proposed values appear to be predicated on an incorrectly calculated Henry's Law constant (HCL) of 5 x 10^{-5} atm-m^3/mol (correct calculation discussed below). This value is higher than the previous DEQ value of 9.2x10^{-6} atm-m^3/mol, and incorrectly designates TCDD as "volatile". The Henry's Law constant for TCDD is estimated as the ratio of the vapor pressure to the water solubility, however, the resulting constant appears to be inconsistent with the vapor pressure (1.5 x 10^{-9} g mm Hg) and the water solubility at 25C (2.0 x 10^{-4} mg/L) provided		

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			in the Superfund Chemical Data Matrix (SCDM) calculations based on the cited vapor pressure and water solubility result in an HLC of $3x10^{-6}$ atm m^3/mol, rather than $5x10^{-5}$ atm m^3/mol, which is consistent with the NIH's Toxnet evaluation of the HLC for TCDD $3x10^{-6}$ atm m^3/mol[5]. Not only has DEQ applied an incorrect Henry's Law constant to TCDD, DEQ has inferred that the same Henry's Law constant would apply for all 17 dioxin / furan congeners. Physical chemistry parameters change with the degree of chlorination with higher chlorinated congeners expected to have lower volatility which is reflected in lower vapor pressures and higher hydrophobicity (a greater likelihood to remain bound in the organic carbon fraction in soil). DEQ's approach will overestimate the volatility of the congeners and therefore result in unrealistic exposure estimates. For the 16 other dioxin I furan congeners, which would be expected to have lower volatility and higher hydrophobicity than TCDD, the soil to ambient air pathway should also be considered NLV. Recommended Action: DEQ should correct the Henry's law constant to be consistent with the NIH Toxnet value of $3x10^{-6}$ atm m3/mol. With this corrected value, TCDD is below the DEQ threshold of 10^{-5} atm m^3/mol for classification as "volatile". Thus, TCDD and other dioxins and furans should retain the designation of NLV for the migration from soil to air pathways. *10-18-2016: Comments resubmitted*	those presented in the same RSL table as the HLC and that they continue to support this HLC value. The USEPA HLC value for TCDD is adopted by reference by other USEPA Region 5 states that defer to the USEPA RSL values for their respective state environmental cleanup programs. To ensure harmonization with the USEPA and Region 5 states, the DEQ will maintain the HLC value of 5.0E-5 atm-m^3/mol for the purpose of deriving generic cleanup criteria. Soil vapor data can be used to evaluate the volatility of TCDD (and other dioxin-like chemicals) on a site-specific basis.	
		CHAMBER	TCDD is a very hydrophobic compound, has a very low vapor pressure, and partitions into the organic content of soil and bioaccumulate into organisms. The key parameter in both of the soil screening levels is the organic carbon-water partitioning coefficient, Koc. DEQ has selected an estimated Koc value, rather than a published peer reviewed value, that does not represent the physical chemistry of TCDD. The Henry's Law constant that underlies the calculations from soil to air is incorrectly calculated. The Henry's Law		

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			constant for volatilization of TCDD from soil overestimates vapor concentrations because the model assumes partitioning between water and air rather than organic matter (where TCDD would likely be bound in soil) and air. As TCDD is very hydrophobic, it will partition into air from water, but the air/water equilibrium is an incorrect conceptual model for volatilization from soil for this particular compound. DEQ's approach incorrectly assumes that all congeners have the same physical chemistry as TCDD, when, in fact, the other 16 congeners have a higher degree of chlorination, and, as such, are less mobile in the environment because, as the number of chlorines increases, the solubility decreases, the volatility decreases, and the hydrophobicity increases. Delete proposed soil criteria for dioxin that are based on dioxin leaching or volatilization (residential drinking water protection, groundwater surface water interface protection, infinite and finite source volatile soil inhalation). Replace proposed criteria with Not Likely to Leach (NL) and Not Likely to Volatilize (NV), respectively.		
50	(7) Table 3	DOW	*9-13-2016*: DEQs 201 requirement that polybrominated biphenyls (PBBs) and coplanar PCBs must also be included in TEQ estimates with polychlorinated dibenzo-p-dioxins and furans (dioxins / furans) is not supported by the scientific literature or public policy. The draft DEQ regulations specify that PBBs, coplanar PCBs, and dioxins / furans "shall be evaluated as a single hazardous substance and environmental concentration expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin based upon the relative potency and concentration of the dioxin-like chemicals present at the facility." The draft revision goes on to state that "All classes of hazardous substances that have documented dioxin-like activity and have toxicity equivalent factors or other relative potency factors recognized by the United States environmental protection agency shall be evaluated as a single hazardous substance and environmental concentrations calculated on the basis	The proposed rules do not include polybrominated biphenyls (PBBs) in the Rule 34(1)(a), Rule 49(1)(O), or do they include reference to TEFs or TEQ estimates (e.g., footnote (O)) in Rule 50, Tables 1 & 3. Dow may be confusing PBBs with polybrominated dibenzo-p-dioxins and dibenzofurans (PBDDs/Fs). The inclusion of the polybrominated dibenzo-p-dioxins and dibenzofurans (PBDDs/Fs) in the April 27, 2016 proposed rules was continued as they were included in the 2002 and 2013 rules. Although these hazardous substances have demonstrated similar aryl hydrocarbon receptor mediate dioxin-like toxicity and order of magnitude relative potency (van den Berg et al, 2013), the DEQ concurs that there currently are not toxic equivalency factors (TEFs) for the PBDDs/Fs that are	

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			of the relative potencies and chemical-specific concentrations present at the facility". First, PBBs do not have toxicity values or toxicity equivalency factors (TEFs) accepted by USEPA and as such should not be included in any analysis on this basis. Combining chemical classes that have very different toxicity and physical chemistry is not supported by the underlying science or public policy. Widely varying properties such as vapor pressure and Koc for the dioxin / furan congeners and coplanar PCBs make reliance on the TCDD physical properties as a single surrogate for all congeners inaccurate. In addition, including coplanar PCB toxicity with dioxin / furan toxicity in a single TEQ double-counts PCBs present in Aroclors, which are also regulated in 201. Moreover, combining these chemical classes does not allow for identification of different sources and thus is not appropriate for generic criteria. Further, the proposed rule is vague and overly broad and, as such, is in excess of statutory authority. For example, the rule does not provide any guidance to determine what "dioxin-like" compounds might be or how those are determined, other than administrative fiat, and applying relative potency factors that are merely "recognized" by USEPA is inappropriate and is not a workable or reliable standard. Recommended Action: TEQ concentrations should be calculated for dioxins / furans alone and for coplanar PCBs alone. In this way, sources, transport and fate, and potential toxicity can be more accurately and efficiently considered. TEQ concentrations for PBBs should not be calculated due to a lack of USEPA approved TEFs. No other "dioxin-like" hazardous substances that do not have TEFS and are not accepted by the scientific community should be included. *10-18-2016: Comments resubmitted with additional* - Under the Statute, Part 201 Criteria Should Only Apply to Chemicals That Are in Fact Site-Related: As currently written, the proposed language regarding treating PBDD/Fs, coplanar PCBs, and PCDD/Fs as a single hazardous substance is vague and confusing. A critical first	recommended by the USEPA (USEPA, 2010) or the World Health Organization (WHO). The DEQ will remove these from Rule 34(1)(a), Rule 49(1)(O) and will delete footnote (O) from the 2,3,7,8-tetrabrominated dibenzo-p-dioxin listing in the tables in Rules 46 and 50. PBDDs/Fs will need to be assessed on a site-specific basis subject to MCL 324.20120b when identified in environmental media. The intent of the proposed language is to identify that 2,3,7,8-tetrachlorodibenzo-p-dioxin and other hazardous substances identified by the USEPA to have dioxin-like toxicity (dioxin-like chemicals or DLCs) with recommended TEFs are to be assessed as a single hazardous substance by the total toxic equivalent concentration (TEQ). The DEQ does not concur with the recommendation to assess the dioxin-like polychlorinated biphenyls (dl-PCBs) separately from polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs). The TEF approach proposed for the PCDDs, PCDFs, and dl-PCBs proposed in these rules has wide acceptance across the globe, the National Academy of the Sciences supports the approach, and the USEPA recommends the approach and the TEFs. The dioxin-like toxicity of coplanar PCBs and additivity with the PCDDs and PCDFs has been well documented, recognized in the scientific community since the early 1990s (Ahlborg et al, 1994; Barnes et al, 1991), and widely accepted with the publication of the 1998 WHO consensus TEFs (van den Berg et al , 1998). The support for the additivity including PCBs was reevaluated in 2005 (van den Berg et al, 2006; Walker et al, 2005). Separate evaluations of these hazardous substances is not consistent with best available science would not adequately protect public health when mixtures of these contaminants are present at a site. The	

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			step in the site assessment process is to identify those specific chemicals that are truly site-related. Owners or operators should only be required to combine those dioxin-like chemicals that are in fact determined to be site-related. PCDD/Fs, PBDD/Fs, and PCBs arise from different chemistries and Industrial operations. In addition, there is a background level of these compounds that is unrelated to any specific industrial operation. Combining coplanar PCBs or PBDD/Fs with PCDD/Fs before a determination that all groups of compounds are site- related may obscure site evaluation and source identification and, thus, is not appropriate for generic criteria. Moreover, the aggregation of multiple chemical classes that typically have different sources abrogates the statutory liability scheme in Part 201. The language in the Part 201 statute provides: • That an owner or operator is only liable "if the owner or operator is responsible for an activity causing a release or threat of release." MCL 324.20126(1). • A "release" includes spilling, discharging, etc." of a hazardous substance into the environment." • Under section 14 of Part 201,the owner or operator's affirmative Investigation and cleanup obligations apply only to "a release for which the owner or operator is liable under section 20126." MCL 324.20114(1). • Liability is not joint and several if a party shows that there is a reasonable basis for apportioning harm. MCL 324.20129(1);accord Burlington N. & Sante Fe Ry. Co. v. United States, 556 U.S. 599 (2009). • In section 20a of Part 201:"the department shall not require response activity in addition to that which is subject to and complies with applicable federal regulations and policies that implement the Toxic Substances Control Act,15 USC 2601to 2692 [TSCA}." The proposed rules are contrary to this liability scheme, negate the divisibility and apportionment defenses available to owners and operators, and fail to recognize and respect the legal jurisdiction of TSCA at many sites. The proposed rules use of a general toxicity equivalency	DEQ does expect there will be some sites where only PCDDs and PCDFs are present, some sites where only dl-PCBs are present, and some sites where PCDDs, PCDFs, and dl-PCBs are present from releases at that site. A site-specific evaluation for these conditions is appropriate. The Part 201 program and criteria have addressed mixtures of chemicals since the beginning of the program (e.g., xylenes, methylphenols, PCBs as aroclors, PBBs, toxaphene). The hazardous substance definition in statute allows the DEQ to demonstrate that any "substance" poses an unacceptable risk to public health, safety, or welfare, or the environment. The term "substance" is used in statute, not "a single chemical." The interpretation that "substance" can be inclusive of more than one chemical is supported by case law where the singular includes the plural and vice versa. DEQ has historically regulated hazardous substances comprised of more than one chemical (e.g., petroleum and hazardous waste), such that this is not a novel concept being newly applied. The requirement to sum the individual concentrations and comparison of that sum to the criterion for TCDD maintains the statutory cancer risk level at 1:100,000. The DEQ concurs that the different PCDDs, PCDFs, and dl-PCBs have different chemical and physical properties that may affect their relative partitioning from one environmental media to another, such as soil to groundwater or soil to air. These differences do not preclude the use of the global consensus TEF approach to assess the total toxic equivalence (TEQ) of these chemical mixtures. The proposed rules allow for direct measurement for leaching to groundwater (Rule 22(1)(b) and (5)) and volatilization to indoor air (Rule 27(2)(d)(iv)) exposure pathways that are not dependent on	

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			factor for dioxins, furans, PBDD/Fs and PCBs fundamentally and improperly amends the statutory liability scheme and is in excess of the DEQ's statutory authority. Under Part 201, owners and operators are only liable to address sources from their own facilities. Lumping multiple chemical classes into one value forces owners and operators that are "liable" for a "release" of one of those classes to, in effect, be "liable" for them all, which is counter to the 201 standard.The proposed rule also requires an owner and operator to take into consideration and address PCBs that are legally governed under TSCA/ improperly extending the reach of Part 201beyond that expressly contemplated by the legislature and allowed by law. Because the proposed rules change the statutory liability scheme, the rules could invite further liability litigation at dioxin and PCB sites across the state, which would impede cleanups, including cleanups at complex PCB sites that have already been the subject of costly and protracted disputes and litigation. An exemption that preserves a party's ability to apportion harm in lieu of applying the prescribed, generic toxicity equivalency factor in the proposed rules could help mitigate this issue. Variability in Physical Chemistry of Congeners Increases Uncertainty in the Aggregated Approach: Widely varying physical chemistry properties such as vapor pressure and Koc for the PCDD/Fs, PBDD/Fs, and coplanar PCBs make reliance on the TCDD physical properties as a single surrogate for all congeners highly uncertain. For example HSDB and ATSDR identify more than 3 orders of magnitude variation in water solubility, and, while all vapor pressures are quite low, these also vary by more than 3 orders of magnitude among dioxins/furans and coplanar PCB congeners. Given this and variability in additional parameters, the transport and fate characteristics of the congeners can vary substantially (NIH HSDB, ATSDR 1998). The World Health Organization (WHO) committee, which developed the TEFs and continue to review them, recognized this concern of assigning a single	these chemical or physical properties. Using the leach test option under Rule 22(1)(b) and (5) to evaluate potential impacts from soil to groundwater or groundwater venting to surface water will directly measure the leachability of the individual dioxin-like chemicals (DLCs). This option will provide a better assessment of the leachability and toxicity of the mixture of DLCs and the soil type than modeled partitioning based on physical and chemical properties. Similarly, measuring soil vapor, considered the best available information under Rule 27(2)(d)(iv), is also a more direct assessment of potential inhalation risk from soil and groundwater contamination than modeled partitioning between these media. As Dow should understand, PCDDs, PCDFs, and dl-PCBs can migrate to and have be found in groundwater, especially when there are other contaminants present at concentrations that enhance this partitioning. Similar enhanced partitioning may also occur for volatilization. USEPA and many other states require cumulative risks to be evaluated, including multiple chemicals and multiple exposure pathways. To account for cumulative risk from multiple chemicals, USEPA and other states add the ratio of the exposure point concentration to the cleanup level from all chemicals or a subset of chemicals with a specific target organ, adverse effect(s), or mode of action are added together. Once that is completed, the risks from multiple exposure pathways for the sites are also added together to determine a hazard index or cumulative cancer risk for the site. The approach identified in the DEQ's proposed rules is equal or less stringent than that used by USEPA and other states.	

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			chemical/physical parameter value to represent the transport and fate characteristics of "complex environmental matrices" widely varying congeners in soil or groundwater and, as a result, the WHO TEF Expert Panel actually recommended that TEFS **not** be applied to abiotic matrices such as soil (van den Berget al. 2006).The USEPA External Peer Review Panel reiterated the importance of considering the variability related to transport and fate of the congeners in their report titled "External Peer Review of Recommended Toxicity Equivalency Factors (TEFs) for Human Health Risk Assessments of Dioxin and Dioxin-Like Compounds (Versar 2009)". USEPA and Other Region 5 States Do Not Provide Screening Levels for Combined "Dioxin-Like" Congeners: The draft DEQ 201requirement to consider aggregated dioxin-like congeners in criteria is not consistent with USEPA or other Region 5 states. USEPA's Regional Screening Level table provides separate screening levels for dioxins (intended for PCDD/Fs), for PCB Aroclors, and for individual coplanar PCB congeners (USEPA 2016). Having separate screening levels facilitates assessments when only certain classes of compounds or congeners are determined to be site-related or in cases where analytical methods dictate comparisons to specific classes such as to PCB Aroclors. Similar to USEPA, other Region 5 states provide soil screening levels for individual classes of compounds. Wisconsin Department of Natural Resources (WDNR 2014) soil residual contaminant levels do not require the addition of PCBs with PCDD/Fs. Ohio EPA Applicable Regulatory Standards consider PCBs and PCDD/Fs separately (OEPA 2014). The Indiana Department of Environmental Management (IDEM 2016) provides separate cleanup levels for PCDD/Fs, for dioxin-like PCBs, and for PCB Aroclors. Similarly, no wording regarding a requirement to determine a combined cleanup level was identified in a search of Illinois Environmental Protection Agency's Tiered Approach to Corrective Action Objectives (ILEPA 2015). PBDD/Fs do not have toxicity values or TEFs accepted by		

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			USEPA and as such should not be included in any analysis on this basis: The language proposed by DEQ states that PBDD/Fs, coplanar PCBs, and PCDD/Fs should be evaluated as a single substance but then goes to make it clear that "All classes of hazardous substances that have documented dioxin-like activity and have TEFs or other relative potency factors recognized by the USEPA shall be evaluated as a single hazardous substance....." These statements are in fact contradictory. Although interim TEFs for PBDD/Fs have been proposed by van den Berget al. (2013), these values are based on a far less robust relative toxicity database and have not been adopted by USEPA. Van den Berget al. (2013) acknowledge that in vivo toxicity studies with PBDD/Fs are very limited and that the mammalian relative effect potency (REP) database as a whole is very limited. Given that the 2005 WHO PCDD/F TEF Expert Panel (van den Berget al.,2006) concluded that in vivo REPs should serve as the primary basis of TEFs, it is critical that the in vitro and in vivo REPs for the PBDD/Fs be examined separately to determine the extent of overlap within the in vitro and in vivo REPs for the PBDO/Fs, as well as to examine the extent of overlap with the PCDD/F REP distributions presented in Haws et al. (2006). Before TEFs for PBDD/Fs are adopted in the US, a process similar to that applied for the adoption of TEFs for the PCDD/Fs should be applied. That is, USEPA needs to review the body of literature supporting the interim PBDD/F TEFs, and then their findings and recommendations need to be subject to public comment and to Science Advisory Board (SAB) peer review. Finally, the PBDD/F mammalian REP database used by van den Berget al. (2013) has yet to undergo rigorous evaluation as was done by Haws et al. (2006) for the mammalian PCDD/F database. Given all of the errors identified in the PCDD/F mammalian REP database as described in Haws et al. (2006),it is critical that the PBDD/F mammalian REP database be subject to a similar rigorous assessment prior to relying on such to establish formal consensus-based TEFs for the PBDD/Fs. The importance of such The TEFs for the PCDD/Fs have		

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			substantial uncertainty associated with them as acknowledged by WHO, USEPA, and others and, as such, requiring that PBDD/Fs be included, which are even more uncertain, results in an assessment that is so uncertain as to be unreliable: TEFs are not rigorously derived toxicity values but rather were developed solely as a risk assessment tool to aid in decision-making. Both WHO (van den Berget at., 1998 and 2006) and USEPA (USEPA,1987,1989, and 2010) have acknowledged the uncertainty inherent in the TEFs and, as a result, have clearly stated that the TEFs represent an interim approach. The uncertainty reflected in the TEFs is demonstrated by the fact that the REP values for any given congener range across multiple orders of magnitude. This substantial variability in the REP values for the same congener is entirely lost as a result of WHO presenting the TEFs as a single point estimate values. As described by Haws et al. (2006) and reiterated by WHO (van den Berget al.,2006),the substantial variability in REPs for the same congener reflects different dosing regimens, study types, endpoints, species, dose-response modelling approaches, and other issues with the underlying dose response data (e.g., nonparallel dose-response curves, differences in maximal responses between the test and reference congener, incomplete dose-response data). Similarly, the USEPA External Peer Review Panel identified many of the same limitations of the TEFs in their report titled "External Peer Review of Recommended Toxicity Equivalency Factors (TEFs)for Human Health Risk Assessments of Dioxin and Dioxin-Like Compounds (Versar 2009). Recommended Action: Separate screening levels should be provided for PCDD/Fs, coplanar PCBs, and Aroclors as done by USEPA to facilitate assessments in cases where some classes may be determined to not be site-related or where dictated by analytical methods employed. Further, PBDD/Fs should not be included at this time as USEPA has not yet formally adopted TEFs for these classes of congeners and there is substantial uncertainty in the interim values proposed by van den Berg et al. (2013).		

Abbreviations:

AAC = Acceptable air concentrations
AAV = Acceptable air values
BEA = Baseline Environmental Assessment
CSA = Criteria Stakeholders Advisory Group
CSF = Cancer Slope Factor
DEQ = Department of Environmental Quality / Department
DQO = Data Quality Objectives
FESL = Flammability and Explosivity Screening Level
HBV = Health-Based Value
IRIS = Integrated Risk Information System
JCAR = Joint Committee on Administrative Rules
LSB = Legislative Services Bureau
Rfc = Reference concentration
Rfd = Reference dose
RPF = Relative Potency Factor
RRD = Remediation and Redevelopment Division
RSL =USEPA Regional Screening Level
SSG = USEPA Soil Screening Guidance
TAG = CSA Technical Advisory Group
TDL = Target Detection Limit
TEF = Toxicity Equivalent Factor
TSD = Technical Support Document
USEPA = United States Environmental Protection Agency
USEPA RAGS = USEPA Risk Assessment Guidance for Superfund
VISL = USEPA Vapor Intrusion Screening Level Calculator
VOCs = Volatile Organic Compounds