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Ms. Eurika Durr, Clerk of the Board
Environmental Appeals Board
U.S. Environmental Protection Agency
1201 Constitution Avenue, NW
WJC East Building, Room 3334
Washington, DC 20004

Via Electronic Mail Filing

RE: Petition for Review / Response to EPA Revised Response to Comments on Draft Class II Permit in Clare County, Michigan, Issued to Muskegon Development Company (Permit No. MI-035-2R-0034), Holcomb 1-22 Well

Dear Ms. Durr:

Enclosed, please find Proof of Service and Petition for Review / Petitioner Response to Permittee and EPA Revised Responses to Select Comments from Petition No. 18-05 regarding the above referenced matter.

Please do not hesitate to contact me with any questions and concerns you should have.

Sincerely,

Emerson Joseph Addison III
emerson.addison@gmail.com

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL APPEALS BOARD

IN THE MATTER OF:

APPEAL NO UIC 18-05
PERMIT NO. MI-035-2R-0034-UIC

MUSKEGON HOLCOMB CLASS II WELL PERMIT

PERMIT NO. MI-035-2R-0034

Petition for Review and Petitioner Response
to EPA Revised Response to Comments on
Draft Class II Permit in Clare County, Michigan
Issued to Muskegon Development Company (Permit No. MI-035-2R-0034), Holcomb 1-22 Well

CERTIFICATE OF SERVICE

25 October, 2019

I hereby certify that copies of the foregoing Petition for Review / Petitioner Response to EPA Revised Response to Comments on Draft Class II Permit in Clare County, Michigan, Issued to Muskegon Development Company (Permit No. MI-035-2R-0034), Holcomb 1-22 Well, were served by Electronic Mail (email) the following persons, on the day of 25 October, 2019:

By electronic filing to:

- * Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
1200 Pennsylvania Avenue, NW
Mail Code 1103M
Washington, DC 20460-0001

By electronic mail to:

- * Muskegon Development Company
c/o: Gina A. Boozer, Esq.
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DATED: October 25, 2019

Sincerely,

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TABLE OF CONTENTS

TABLE OF CONTENTS.....5

TABLE OF AUTHORITIES.....6

STATEMENT OF COMPLIANCE WITH WORD LIMITATION.....7

I. INTRODUCTION..... 8

II. RESPONSE TO EPA RESPONSES TO COMMENT #208 - 10

 A) Comment #20..... 8-9

 B) Response to EPA Response to Comment #20.....9-10

III. RESPONSE TO EPA RESPONSE TO COMMENT #24.....10-12

 A) Comment #2410-11

 B) Response to EPA Response to Comment #2411-12

IV. RESPONSE TO EPA RESPONSE TO COMMENT #2512-14

 A) Comment #2512-13

 B) Response to EPA Response to Comment #2513-14

V. RESPONSE TO EPA RESPONSE TO COMMENT #2614-15

 A) Comment #2614

 B) Response to EPA Response to Comment #2614-15

VI. CONCLUSION15-16

TABLE OF AUTHORITIES

Ingraffea, Anthony, 2013, Fluid Migration Mechanisms Due to Faulty Well Design and/or Construction: An Overview of Recent Experiences in the Pennsylvania Marcellus Play, Physicians, Scientists, and Engineers for Healthy Energy 10 – 16

[this document has already been added to the Amended Administrative Record as document #93]

STATEMENT OF COMPLIANCE WITH WORD LIMITATION

This brief complies with the 14,000-word limitation found at 40 C.F.R. § 124.19 (d)(3).
See 40 C.F.R. § 124.19 (d)(1)(iv).

I. Introduction:

This Petition for Review / Reply Brief is in Response to the Remanded Response to Petitions filed against Muskegon Development Class II Injection PERMIT NO. MI-035-2R-0034-UIC, APPEAL NO UIC 18-05.

In the original Response to Petitions, the EPA failed to respond to several comments and explain how its Environmental Justice guidelines factored into the decision. Although the EPA maintains this was an oversight, upon reviewing the original comments for the omitted responses, I believe that the EPA intentionally declined to respond to these comments.

Comment #20 demonstrates considerable demographic and socioeconomic knowledge of the community, as well as technical knowledge of private well construction, maintenance, and cost. The original lack of response to this comment makes perfect sense from the perspective of the EPA: The EPA knows this is a poor community that relies on well water and the people here cannot afford the extra testing. The EPA also knows the people living here can't afford lawyers to properly challenge this case. The EPA also knows that the vast majority of the people in this community lack the legal knowledge (and time) to mount an effective challenge. However, the person who wrote Comment #20 clearly knows a few things about the community and about wells, and would therefore be more difficult to respond to.

Comments #24 and #25 were also technical in nature, citing scientific studies and peer-reviewed papers, studies and reviews to which the EPA is unable to provide a reasonable response. And Comment #26 directly addresses concerns about well water safety and also demonstrates a certain level of technical knowledge regarding the issues concerning injection wells and water safety.

Again, these comments are technical in nature, and therefore would be more difficult to address. As such, the EPA has predictably regurgitated its own bureaucratic guidelines, but only after being forced to respond to these comments.

Sadly, relying on canned responses and citing technical specifications and government regulations is merely a way to avoid the real meat of the issue: This project, though profitable for a small group of people, is also dangerous to the community.

It is true that the EPA claims it has guidelines and regulations to protect this community, but as I will demonstrate, these rules are wildly insufficient, ambiguous, and nearly impossible to enforce. In addition to these flaws, the EPA guidelines are also based on questionable science.

II. RESPONSE TO EPA RESPONSE TO COMMENT #20:

A. Comment #20: Low income population of the well site area should be factored into permit decision:

“My hope is that EPA staff will understand the human condition that surrounds this well site and give due consideration to those concerns if any of the other conditions of approval are in question. If you

look at the demographics of Michigan, you will note that Lake County and Clare County are the most impoverished area within our state. The northern half of Clare County is the most impoverished area within our county. The last numbers I saw the median income in that area was under \$20,000 per household. The Dodge City area is likely the most impoverished area in northern Clare County and it is located 2 miles west of the Holcomb 1-22 well site. As a full time realtor in Clare, Gladwin and Isabella County for over 25 years, I have seen this poverty first hand. Last year (per the Clare/Gladwin MLS) there were 239 home sales in the Harrison Area. 105 of those sales were under \$50,000. Most of these sales are in residential areas served by private well and septic systems.”

“Most of the wells we see in that area are 1 or 1.5-inch diameter hand-driven wells that were put in prior to the health department permit requirements and they remain in use today because of the cost of upgrading and the homeowner’s inability to fund improvements. While I understand that contamination from this project is unlikely, the unlimited use of excessive and unlimited quantities of water from the water table is a concern.”

B. Response to EPA Response to Comment #20:

The EPA states that it took environmental justice into consideration, even stating that it identified that 56% of the local population is low income. It goes on to list several other factors it considered, most of which involve pollution levels in the community. Basically, the EPA is arguing that it is OK to risk poisoning the community a little bit, just not too much. The argument then shifts to how sick Muskegon Development should be allowed to make the community and what are the acceptable levels of risk to drinking water and to human health.

The EPA then claims permit conditions already protect the community and any water upon which low-income people rely. After citing more bureaucratic regulations and technical specifications, the EPA returns to the subject of environmental justice.

“EPA’s EJ analysis considered both the expressed financial straits of the affected community as well as the potential for adverse effect to the community’s underground drinking water supplies. EPA assessed the likelihood of the Muskegon well causing an impact to the full population as extremely low.”
(Revised RTC on draft, page 15)

The part about “causing an impact to the full population” certainly stands out. This is a rather ambiguous phrase. Does it mean that causing impact to part of the community, say one or two families, is acceptable? If so, why is this risk acceptable? Or does it mean that, if something happens, it will impact the entire community, so they are simply calculating the odds for a major problem and trying to decide what kind of odds they should get before rolling the dice for the entire community?

The EPA then lists basic construction safeguards.

“The proposed well is for injection of fresh water (ground water), the well is designed with multiple barriers (multiple steel well casings, cement between casings, injection through steel tubing, annulus fluid to monitor and contain any future leaks from the tubing), and the geology of the well site contains multiple formations of impermeable rock to prevent upward migration of any fluid leaks. See RTC Responses #10, 12 (AR 18), and Permit at Part II.A, Part II.B.1.d, Part III.B (AR 7).” (Revised RTC on draft, page 15)

Sadly, every single safety measure used in the construction and operation of the well (multiple steel well casings, cement between casings, injection through steel tubing, annulus fluid to monitor and contain any future leaks from the tubing) brings questionable levels of protection. Some, such as the use of multiple casings to prevent fluid migration, could even be counterproductive.

According to a paper by Anthony Ingraffea, "Fluid Migration Mechanisms Due to Faulty Well Design and/or Construction: An Overview and Recent Experiences in the Pennsylvania Marcellus Play," which has already been entered into the case record and which will be discussed in more detail in my response to the response to Comment #24, the phenomenon of gas, or additional fluid, migration upwards along a wellbore is not very well understood. In the introduction on the very first page of his paper he notes that ***“Additional layers of casing and attendant cement interfaces, present in the defective wells in question, do not eliminate these phenomenon; they may, in fact, increase its likelihood.”***

The data used in Ingraffea’s report was gathered from many different kinds of wells, not just fracking wells. These wells were located in many different states under many different geological conditions. And this data, as well as data from numerous other studies on the effects of oil and gas wells, clearly indicates that these wells often leak, and that the causes of these leaks are not well understood.

In other words, there simply isn’t enough information for the EPA to make a safe decision, and there is significant reason to believe there is a significant risk to the community. These wells eventually leak. Given enough time, it is inevitable.

Although the EPA argues that this paper is not applicable, I personally spoke to Anthony R. Ingraffea, Professor Emeritus and Dwight C. Baum Professorship in Engineering at Cornell University. He assured me that his paper does apply to the Muskegon Development well, as well construction, maintenance, operation, and design methods apply to all wells used throughout the industry.

But there is another big problem with the EPA response: The EPA failed to address the entirety of this comment.

Comment #20 clearly states “the unlimited use of excessive and unlimited quantities of water from the water table is a concern.” Unfortunately, the EPA has shied away from responding this concern.

Because the science indicates these wells are dangerous, prone to leaks, and that the causes for these leaks are not well understood, and because the EPA issued inadequate responses to Comment #20, and entirely failed to address the issue of water withdrawal affecting the community, this permit should be denied.

III. RESPONSE TO EPA RESPONSE TO COMMENT #24:

A. Comment #24: Well casing failures

“A full survey of the area needs be conducted to locate orphan wells and make sure that they are adequately plugged and if they are in fact leaking from well casing failure or other failure.”

“I urge EPA to reject the permit well because of the known rates of well-casing failures. Because all well casings of injection wells (and frack wells) eventually fail--some right away, some in a few years, and all eventually--this guarantees that the toxic waste in the injection well will eventually endanger drinking water and aquifers.”

“I put the following scientific study by Anthony Ingraffea, Ph.D., P.E., into the record: "Fluid Migration Mechanisms Due to Faulty Well Design and/or Construction: An Overview and Recent Experiences in the Pennsylvania Marcellus Play," January 2013. Physicians, Scientists & Engineers for Healthy Energy. [This study has been added by EPA as Document #93 to the Amended Administrative Record.]”

B. Response to EPA Response to Comment #24:

Once again, the EPA response is predictable and inadequate. First, the EPA attempts to refute the study by claiming that it only concerns well construction in the Pennsylvania Marcellus Shale region, an area with heavy fracking (and the water problems that go along with it), and therefore that this study doesn't apply to Clare County, Michigan.

I refute this claim. Although the primary area of the study is heavily fracked, the wells in the study were not all frack wells, nor were definitive causes of all the well failures identified. Moreover, this study included data from many types of wells in many different areas with many different geological settings and locations not part of the Marcellus Shale.

Moreover, the study emphasizes failures stemming from well construction. These failures are certainly not unique to fracking wells or to Pennsylvania Marcellus Shale, nor the wells included in the study (this study uses data from thousands and thousands and thousands of wells).

Moreover, there is a general lack of studies about injection wells – either fracked or not. Nor have there been many studies of injection wells in areas with comparable geography to Clare County.

THIS STUDY IS ABOUT WELL FAILURE RATES – NOT THE GEOLOGY OF THE AREA IN WHICH THE FAILURE OCCURRED, NOR THE TYPE OF WELL THAT FAILED.

As such, this study is applicable. Hell, Clare County has an oil and gas history that goes back to the 1930s, a time in which well construction was not the “science” it is today, a time when well locations often weren't even charted correctly (thus raising doubts that we even know where all the old wells are – meaning some of them might be “lost”), a time when old wells were often literally plugged with garbage such as old boots and rusty wrenches (seriously – I spoke to representatives from the Michigan Department of Environmental Quality about this).

The EPA also attempts to dismiss the study by citing differences in geology of these areas.

On page 20 of its response to Comment #24, the EPA even argues that “A properly-constructed UIC well with multiple concentric steel well casings with cement between casings, with a well packer and annulus fluid provide a system with multiple, redundant barriers to prevent any leak from reaching underground sources of drinking water.”

In light of the Ingraffea paper, this response is laughable, as the SECOND PARAGRAPH OF THE FIRST PAGE of the Ingraffea paper, which discusses “a schematic depiction of the phenomenon of gas, or additional fluid, migration upwards along a wellbore” literally refutes this claim.

Ingraffea discusses these failures and presents several possible fluid pathways, including “the simplest case of bypass by disbonding along the surface casing.”

Ingraffea then continues to state that ***“Additional layers of casing and attendant cement interfaces, present in the defective wells in question, do not eliminate these phenomenon; they may, in fact, increase its likelihood.”***

On page 4 of his paper, Ingraffea states, **“It should be noted that, even with ongoing technological and chemistry improvements in cement and in cementing, loss of wellbore integrity is still common.** For example, during 2011, Cabot drilled 68 new Marcellus wells in Pennsylvania, and was cited by PA DEP seven times for “Failure to report defective, insufficient, or improperly cemented casing w/in 24 hrs or submit plan to correct w/in 30 days”. Chesapeake Appalachia drilled 279 wells and was cited 24 times for the same violation.”

So, in addition to failures being common, oil and gas corporations have a poor track record for well integrity and for self-reporting. Indeed, the fact that this study also points to serious flaws in the self-reporting of oil and gas companies is yet another reason to reject this permit.

Ingraffea also critiques industry arguments minimizing observed methane concentrations in residential wells near oil and gas fields. Continuing his critique, on page 5 he cites several other studies, arguing “if and when methane does occur at high levels in water wells near gas drilling, it is likely due to some aspects of gas drilling, fracing and/or production operations themselves. This is consistent with both the Osborn, et al. (2011) study and the EPA Pavilion (2011) preliminary report. ***Exact migration mechanisms are not yet completely clear in each case, but the potential well failure mechanisms described in the previous section are often implicated.***”

Adding to these concerns, on page 4 Ingraffea even argues that ***“The science on contamination of drinking water from shale gas drilling, fracing, and production, is recent, ongoing, and incomplete.”***

Ingraffea’s paper covers a variety of wells in a variety of settings – not just fracking well in Pennsylvania. Therefore, this study is applicable. Moreover, since the Ingraffea paper casts doubt over EPA claims of safety, even arguing that some of the required safeguards in well construction might even be counterproductive and increase the likelihood of leaks, this permit should be denied.

IV. RESPONSE TO EPA RESPONSE TO COMMENT #25

A. Comment #25: Structural failures inside injection wells are common

“A ProPublica review of well records, case histories, and government summaries of more than 220,000 well inspections from October 2007 to October 2010 found that structural failures inside injection wells

are routine. From late 2007 to late 2010, one well integrity violation was issued for every six deep injection wells examined — more than 17,000 violations nationally. More than 7,000 wells showed signs that their walls were leaking. Records also showed wells are frequently operated in violation of safety regulations and under conditions that greatly increase the risk of fluid leakage and the threat of water contamination. ProPublica's analysis showed that, when an injection well fails, it is most often because of holes or cracks in the well structure itself. Once wastewater is underground, there are few ways to track how far it goes, how quickly, or where it winds up, raising concerns that it may migrate upward back to the surface. The hard data that does exist comes from well inspections conducted by federal and state regulators, who can issue citations to operators for injecting illegally, for not maintaining wells, or for operating wells at unsafe pressures, yet the EPA has acknowledged that it has done very little with the data it collects.”

B. Response to EPA response to Comment #25:

The EPA response to Comment #25 was, once again, short, predictable, and inadequate. The EPA simply explained the regulations pertaining to well construction and operation and stated that “The “statistics” that commenters mentioned do not reflect EPA’s experience in Michigan. In a review of all active Class II injection wells in Michigan over the past five years, the failure rate has been no higher than 5% in any given year.”

Basically, what the EPA is saying is that there is “only” a 1 in 20 chance EVERY YEAR that this well will experience some kind of a failure (which begs the question: How long will this well be operational?). Of course, if that happens, the community must depend on Muskegon Development to notice the failure, properly report the failure, AND properly respond to and correct the failure.

I once again point to the Ingraffea paper, where on page 6, Ingraffea clearly states, regarding the reporting process for violations and cement failures, that “more wells have failed cement jobs than have been reported through the violations.” He elaborates on his findings, explaining that, after doing a more complete search for violations, he found that:

“The inspection reports indicate that many failed wells were not issued violations. Rather, they received “Violation Pending” comments; or comments indicating that “squeezing”, a cement repair procedure which would only be done if a well was leaking outside its production casing, had been done or was to be done; or comments that repairs were underway for a perforated casing; or comments that gas was detected at the wellhead at or above the LEL (lower explosive limit).” (Ingraffea, page 8)

Thus, Ingraffea argues that failure rates are widely under-reported. And this is assuming that all the violations were reported. In other words, *IF* the monitoring process can be trusted, there is still a very high rate of failure.

One must ask just how reliable are the figures of well failures for Michigan? Well, according to the EPA:

“The “statistics” that commenters mentioned do not reflect EPA’s experience in Michigan. In a review of all active Class II injection wells in Michigan over the past five years, the failure rate has been no higher than 5% in any given year.” (Revised RTC on draft, page 20)

To begin, it would be helpful if some citation for this alleged “review of all active Class II injection wells in Michigan over the past five years” were provided. But no citation is provided. This lack of citation is cause to reject this argument for one simple reason: How is one to verify this claim?

Because no citation to this study is provided, the rest of the argument, involving the type of leaks and frequency of occurrence, must therefore also be tossed out. Indeed, without citation, this is impossible to verify. And given the alarming number of oversights and errors committed by the EPA in this case – so many that a partial remand was issued for the permit – it is difficult to believe the EPA is acting in a fair and impartial manner, which is yet another reason this permit should be denied.

After giving an inadequate explanation of well construction safeguards, the EPA explains that “If monitoring indicates a leak in the annulus or if the well should fail a mechanical integrity demonstration, then the permit requires the well to be shut down immediately and the failure reported to EPA within 24 hours. This is what EPA considers a well “failure.”

There are at least two problems with this.

First, the range of what the EPA considers to be “well failures” appears to be very narrow. Certainly there are many other problems that can occur which would endanger this community. Are these problems considered? Why such a narrow definition of well failure?

A second problem is, again, the issue of adequate monitoring and reporting. As Ingraffea stated, “The inspection reports indicate that many failed wells were not issued violations.” So, when the EPA claims that its experience in Michigan is a 1 in 20 failure rate per year, are they including all failures, or just the ones that received official violations? But again, without actually seeing these statistics, it is not possible to know. For this reason, as well as many others, this permit should be denied.

V. RESPONSE TO EPA RESPONSE TO COMMENT #26

A. Comment #26: Please protect the water supply

“You have a difficult job to do. I would like to add to the comments not in favor of extending this well's output by forcing fresh water or brine to disperse its remaining reserves into the existing oilfield. The cost seems too high for the area residents. They are concerned about their drinking water. Please protect the water first and foremost. “Only when the last tree has died & the last river has been poisoned & the last fish has been caught will we realize that we cannot eat money.” Please choose wisely.”

B. Response to EPA response to Comment #26:

Once again, the EPA attempts to hide behind an explanation of the regulations and a brief description of the reporting process. This is a flawed argument.

For starters, this argument assumes that the regulations are adequate, the monitoring will be done correctly and in good faith, and the monitoring will be honestly reported. But there is another, very significant, problem with this argument. The EPA attempts to assuage doubts by listing its monitoring,

inspection, and review record from 2017:

“In federal fiscal year 2017, EPA inspected 518 wells, reviewed 13,560 monitoring reports, witnessed 226 mechanical integrity tests, reviewed reports from 32 well mechanical integrity or geologic reservoir tests, and issued four information collection orders.” (Revised RTC on draft, page 22)

Unfortunately for the EPA, these numbers only add doubt to its ability to monitor and regulate these wells. Consider that there are nearly one million active oil and gas wells in the United States. Moreover, since 2010, more than 130,000 new wells have been drilled. Indeed, on page 8 of the Ingraffea study, Ingraffea argues that “This apparently low failure rate should be seen in the context of a full buildout in the Pennsylvania Marcellus of at least 100,000 wells, and in the entire Marcellus, including New York, of twice that number.” He continues to argue that “one could expect at least 10,000 new wells with compromised structural integrity.”

So that’s over 300,000 wells in just two states. In light of how many wells there are, the EPA’s inspection of 518 wells and review of 13,560 monitoring reports seems painfully inadequate. If 518 out of approximately 900,000 wells were inspected, that is an inspection rate of .0057555555%. Worse, only 226 mechanical integrity tests were performed, which is .0025111111% of wells. Even worse, the EPA only “reviewed reports from 32 well mechanical integrity or geologic reservoir tests” (.0003555555% of wells). These figures are so small by comparison to the whole, they are completely insignificant and virtually worthless. And given that such a shockingly low percentage of these wells were actually reviewed or monitored in any way by the EPA, it is equally alarming that the EPA issued only four information collections orders.

However, there is yet another problem with introducing this data: The EPA merely gives a brief summary. It is not possible to challenge the EPA assessment of this data unless all the inspections, monitoring reports, integrity tests, and reviewed reports are included. Unfortunately, these documents have not been provided, nor have they been entered into the record. Because the EPA has made a thorough review and challenge to its argument impossible, this permit must be denied.

But one must also wonder if the insignificant oversight performed by the EPA is caused by a lack of budget or a lack of interest. Either way, how can any community trust the EPA to protect them?

Again, the alarmingly low oversight statistics are ample reason to deny this permit, as is the lack of documentation to support EPA claims.

VI. Conclusion

I have no doubt that the EPA will attempt to dismiss my arguments. In particular, the EPA will most likely, once again, argue that the Report by Anthony R. Ingraffea, Professor Emeritus and Dwight C. Baum Professorship in Engineering at Cornell University, does not apply to this case.

I would like the EAB to know that I personally spoke to Professor Emeritus Anthony R. Ingraffea on Oct. 25, 2019. We discussed exactly this question. Dr. Ingraffea assured me that yes, it does apply. He told me that the construction, operation, and maintenance of these wells is

done according to industry standards and applies to wells throughout the industry. He told me that even if the well was constructed correctly, it can still experience a failure and start leaking. He told me that the science is not settled and that there is risk to this community from this well and from every other well in the area.

Clearly, the EPA interpretation of his paper is incorrect. Indeed, as I have already argued, Professor Emeritus Ingraffea's paper includes data from thousands and thousands of wells, many of which are not located in the Pennsylvania Marcellus Shale and are not used for fracking.

So everything in Professor Emeritus Ingraffea's report – which is part of the official record for this case – does indeed apply.

If you do not believe me, here is **Professor Emeritus Ingraffea's cell phone number: 607-351-0043**. Dr. Ingraffea will assure you that I am correct and that we did, indeed, speak about this matter, and that yes, there is risk.

For this reason, and for many others, including the failure by the EPA to properly address the substance of Comments #20, #24, #25, and #26, this permit must be denied. The responses given by the EPA were inadequate and often relied on incomplete science, incomplete data, questionable figures, and statistics which were not properly cited or even entered into the record for this case.

The Muskegon Development project presents a significant risk to the community. Most members of this community lack the money to perform the additional testing that will now be required on their own wells. The risks of injection wells and causes for failure are poorly understood and the science is ongoing. Moreover, the abundance of comments and high turnout at the public participation meetings clearly shows that the vast majority of the community is against this project.

For these reasons, please deny this permit.

Sincerely,

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