Interim Report

to the 87th Texas Legislature

House Interim Study Committee on Aggregate Production Operations

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HOUSE INTERIM STUDY COMMITTEE ON AGGREGATE PRODUCTION OPERATIONS TEXAS HOUSE OF REPRESENTATIVES INTERIM REPORT 2020

A REPORT TO THE
HOUSE OF REPRESENTATIVES
87TH TEXAS LEGISLATURE

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Committee On
Aggregate Production Operations

January 8, 2021

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P.O. Box 2910
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The Honorable Dennis Bonnen
Speaker, Texas House of Representatives
Members of the Texas House of Representatives
Texas State Capitol, Rm. 2W.13
Austin, Texas 78701

Dear Mr. Speaker and Fellow Members:

The Committee on Aggregate Production Operations of the Eighty-sixth Legislature hereby submits its interim report including recommendations and drafted legislation for consideration by the Eighty-seventh Legislature.

Respectfully submitted,

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Rep. Armando Martinez

Rep. Alma Allen

Rep. J.M. Lozano

Rep. Andrew Murr

Rep. Jared Patterson

Rep. Erin Zwiener

Mr. Greg Hale

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AGGREGATE PRODUCTION OPERATIONS

Sand, gravel, and crushed stone. the main types of natural aggregate. are essential resources for use in construction. Today, aggregate production accounts for about half of the nonfuel- mining volume in the United States.

In the future, the rebuilding of deteriorated roads, highways, bridges, airports, seaports, waste disposal and treatment facilities, water and sewer systems, and private and public buildings will require enormous quantities of aggregate to be mined.

-Aggregate & the Environment, 2004

Aggregate consists of grains or fragments of rock that are removed from their natural state in the earth and used in the production of a variety of infrastructure, construction, and industrial purposes either in their raw state or processed into smaller pieces. [1] When used for construction, these products are often combined with a binding medium to make concrete, mortar, or asphalt. They can also form the base for unpaved road, railroad tracks, or in municipal water systems as part of a filtration system.

In their review of Aggregate Production in the United States, the United States Geological Survey (USGS) found that aggregate production in 2019 reached 1.5 billion tons of product worth $18.4 Billion. [2] Texas aggregate production in 2019 reached 282 million metric tons of material worth $3.2 Billion, representing a 30% increase in production since 2005, when the Texas Legislature set in place the standard permit regulating the amount of particulate matter introduced into the air by the rock crushing equipment used by Aggregate Production Operations (APOs).

The growth of the APO industry in Texas has been largely fueled by the rapid economic growth of the state overall. The Texas State Demographer's reports show a 15% rate of growth from 2000-2019, and projects that growth to accelerate, with Texas growing from 29.7 Million people in 2019 to 54.4 Million in 2050, a 55% rate of growth, and almost quadrupling the 2000-2019 rate of expansion. [3]

However, that growth is not happening evenly across the entire state. From 2018 to 2019 Texas grew by an estimated 365,582 people. 74% of that growth, roughly 271,833 people, came from the ten highest growth counties in the state, located in urban areas and expanding into the surrounding suburban and rural areas as well.

As this growth expanded, turning once suburban areas more urban and rural areas more suburban, the demand for locally sourced aggregate to fill the infrastructure, housing, and commercial needs of the populace brought in new quarries and expanded existing operations extensively. This was

[1] (Langer, Drew and Sachs 2004, 7)
[2] (Willett 2020)
[3] (Potter 2020)

due to the high "place value" of aggregate. [4]

The market for aggregate is one of high volume and low margin. The low ratio of weight to market value means that the cost of transporting aggregate long distances can have a significant impact on the price of the material to the end user, making deposits far less economical the farther removed they are from their delivery point. [5] Place value plays an especially large role for concrete batch plants, as a wet batch of concrete must be poured within 90 minutes of being loading. [6]

Over the last decade the expansive rate of population growth, increased demand for aggregate materials for construction, and the difficulty transporting aggregate products, has resulted in conflicts between local governments, individuals, and APOs. The overarching view from the Representatives and Senators of the 86th Legislature was that something needed to be done to limit the negative impact of APOs on individual health and local government infrastructure.

The regulation of APOs requires a delicate balancing act. APO products are important to the continued economic development of Texas. Significant disruptions to the market for construction materials could potentially risk slower economic growth, should prices for raw construction materials increase sharply. However, two considerations are relevant:

1. Texans whose homes and communities are encroached upon by an ever-increasing APO industry should be properly protected from those who would endanger their health and lower their quality of life by cutting corners and operating outside of industry best practices to lower production costs.

2. The APO industry should assess their demand/installed capacity ratio, particularly in areas where growth and demand for APO products are high. Even though most APOs are permitted for a 24/7, 365 days/year operation, it is believed that this ratio is significantly less than 1.0. If this is confirmed, recommendations in this report will likely have little to no disruptions in APO product availability to sustain current growth.

The 86th Legislature brought forward a number of bills designed to resolve these conflicts.

The first and most basic idea was that increasing the distance between APOs and residential/ commercial areas, schools, or houses of worships. For the 8% of Concrete Batch Plants (CBPs) which use the "enhanced controls" permit [7] in the Texas Health & Safety code Sec 382.05198, their facilities cannot be built within 440 yards of a single or multifamily residence, school or place of worship. The other 92% of CBPs who obtain a standard permit though Sec 382.05198 are exempt from this requirement. Currently in the Health and Safety code a central baghouse must be at least 440 yards from a single or multifamily residence, school, or place of worship. [8]

There were a variety of bills that sought to address changes to the distance setbacks. The first was

[4] (Langer, Drew and Sachs 2004, 8)
[5] *ibid*
[6] (American Society for Testing and Standards 2003, 7)
[7] Tex. Health & Safety Code Ann. § 382.05198
[8] Tex. Health & Safety Code Ann. § 382.065

to extend the distance from 440 yards to 880 yards. SB 208 by Campbell[9], HB 3817 by Kacal, [10] and HB 4247 by Wilson [11] all would have increased the setback distance for aggregate, and the committee substitute for HB 1280 did the same for concrete batch plants.

In addition to the basic distance increase there were a few other bills that presented variations on the same idea. HB 4247 by Wilson would have determined the distance for setbacks from residential areas from the property line of the property used for the aggregate production instead of measuring from the central baghouse or rock crushing equipment. A lack of detail in permit application maps often makes it impossible to determine the location of the baghouse. HB 798 (86R) by Rep. Walle was written in part to address this problem.

HB 4247 by Wilson sought to add hospitals to the list of facilities that should be considered for the distance setback and SB 417 by Miles [12] added public parks and outdoor recreation facilities. HB 3033 by Zwiener [13] would have given Hays county the ability to increase the setback for those buildings to one mile from an aggregate facility. Going the other direction, HB 4063 by Martinez would have allowed for concrete crushing facilities in certain smaller counties to have an exception for the 440-yard limit if they only operated for 90 days and only between 8am and 6pm. [14]

Another set of bills addressed the process for requesting a public hearing as part of the TCEQ air quality permit application process for APO equipment. Currently, only individuals residing withing 440 yards of a concrete plant may request a TCEQ hearing. [15] HB 1280 by Allen [16] would have changed that to include individuals with a fiduciary responsibility from a representative of a school, place of worship, licensed day-care center, hospital, or medical facility. [17] This would give parity to the individuals and listed organizations that live within the 440 yards of a proposed concrete plant.

Next, legislators sought to address the nuisance impact from sound and light on individuals. SB 417 by Miles would have removed the requirement for lighting the emission silo, which would cut down on light pollution at night near residential areas. Similar to that bill, HB 2939 by Zwiener would have limited an aggregate facility operating within half a mile of a residence to the hours between 7am and 9pm.

Air quality and the impact on health is the reason that the main permit issued by TCEQ is an "air quality" permit. To limit dust creation there were two bills filed. The first was HB 4422 by Wilson which would have required internal roads be paved to reduce the creation of dust. [18] The second was HB 4409 also by Wilson which would have created a real-time air quality monitoring system

[9] Tex. S.B. 208, 86th Leg., R.S. (2019)
[10] Tex. H.B. 3817, 86th Leg., R.S. (2019)
[11] Tex. H.B. 4247, 86th Leg., R.S. (2019)
[12] Tex. S.B. 417, 86th Leg., R.S. (2019)
[13] Tex. H.B. 3033, 86th Leg., R.S. (2019)
[14] Tex. H.B. 4063, 86th Leg., R.S. (2019)
[15] Tex. Health & Safety Code Ann. § 382.058
[16] Identical bills include Tex. H.B. 999, 86th Leg., R.S. (2019), Tex. H.B. 1310, 86th Leg., (2109), & Tex. S.B. 1247, 86th Leg., (2019.
[17] Also note that this was a recommendation from the TCEQ to the 86th Leg. (Texas Commission on Environmental Quality 2018, 71-72)
[18] Tex. H.B. 4422, 86th Leg., R.S. (2019)

maintained by the owner of the facility. [19]

Continuing, there was increased concern regarding the impact of aggregate and concrete facilities on road and transportation infrastructure. West Texas and other areas with increased oil and gas traffic have seen the detrimental impact of increased heavy commercial traffic on roads that were not designed to handle the weight and the volume that is created. HB 3034 by Zwiener would have prevented aggregate facilities from tying into roads unless all those roads had established load limits. [20] HB 924 by Zedler would have allowed county commissioners court to require a surety bond from concrete plants for any damage to highways or roads directly impacted by the increased commercial traffic.[21]

Looking at how land and communities can regulate aggregate facilities when they are finished, a variety of bills sought to add a reclamation process. HB 2710 by Murr, would have authorized cities to require a reclamation bond for aggregate facilities in their extraterritorial jurisdiction. [22] HB 509 by Wilson, [23] HB 3798 [24] and HB 2871 [25] by Biedermann both would have added a requirement for a reclamation to the permit process for all aggregate production operations. This would require a bond to be held to cover returning the land used for quarrying to a state that could be used for something else afterwards.

In addition to the more general options, there were two bills filed that had specific references to areas designated as ecologically sensitive areas. HB 1671 by Huberty [26], would have added the south fork of the San Jacinto river, and HB 2942 [27] by Guillen would have added the area for sand mining above the Carrizo Aquifer.

Lastly, the legislators looked at amending the permit processes. On the concrete side, SB 417 by Miles [28] and the house companion HB 798 by Walle [29] would have increased the information required on the standard permit to include a distance scale, north arrow, all property lines, emission points, and if the permit requires a setback, how those setbacks will be met. HB 1309 by Dutton [30], would have added Ready-Mixed Concrete to the list of facilities that TCEQ is authorized to inspect and permit under federal EPA guidelines for new, renewal and expansion permits. The requirements to be increased included regulatory analysis and more rigorous air quality monitoring data.

HB 509 by Wilson, HB 3798 and HB 2871 by Biedermann all sought to move APO permits from the TCEQ standard permit to a general permit with the Texas Railroad Commission, adding

[19] Tex. H.B. 4409, 86th Leg., R.S. (2019)
[20] Tex. H.B. 3034, 86th Leg., R.S. (2019)
[21] Tex. H.B. 924, 86th Leg., R.S. (2019)
[22] Tex. H.B. 2710, 86th Leg., R.S. (2019)
[23] Tex. H.B. 509, 86th Leg., R.S. (2019)
[24] Tex. H.B. 3798, 86th Leg., R.S. (2019)
[25] Tex. H.B. 2871, 86th Leg., R.S. (2019)
[26] Tex. H.B. 1671, 86th Leg., R.S. (2019)
[27] Tex. H.B. 2942, 86th Leg., R.S. (2019)
[28] Tex. S.B. 417, 86th Leg., R.S. (2019)
[29] Tex. H.B. 798, 86th Leg., R.S. (2019)
[30] The intent of this bill was to restore the contested case hearing process to the 8% of CBPs that were applying for the "enhanced controls" version of the permit described by Tex. Health & Safety Code Ann. § 382.05198.

additional considerations as well. Standard Permits, like the ones used for TCEQ's Air Quality Permit, are effective at establishing compliance with narrowly focused topic areas but are not sufficient to stand as the sole requirement for industrial hard mineral extraction operations. This would also allow for the creation of a contested case hearing. As was mentioned earlier, those bills also included requirements for reclamation procedures.

As a result of the complexity of balancing proper regulations for APOs with the economic realities of maintaining the level of economic growth that benefits all Texans, Speaker Dennis Bonnen issued a proclamation creating the House Interim Committee on Aggregate Production Operations (Committee), tasking the Committee with reviewing the issues involved and making recommendations to the 87th Texas Legislature as follows:

1. In conducting the review, investigate APO-related issues, such as:
    1. (1) general enforcement of regulations;
    2. (2) nuisance issues relating to dust, noise, and light;
    3. (3) transportation safety and transportation integrity;
    4. (4) air quality;
    5. (5) blasting enforcement;
    6. (6) reclamation efforts;
    7. (7) distance of facilities from adjoining property lines;
    8. (8) disruption of groundwater;
    9. (9) the impact of municipal ordinances; and
2. (b) Monitor the implementation of **HB 907,** relating to the regulation of APOs by the Texas Commission on Environmental Quality.

The Committee has reviewed the issues according to Speaker Bonnen's proclamation and presents the following report and recommendations.

Aggregate Production Operation Related Issues

1. Noise Pollution

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

The main sources of noise from APOs comes from the machinery used to move earth, rock crushing equipment, truck traffic, and blasting. [31] The source of the sound, the topology, climate conditions, and the rhythmic nature of the sound all contribute to how much the same overall volume of noise impacts those living in proximity to an APO.

The level of disruption caused also varies based on how accustomed those around the APO are to higher levels of background noise. Urban or industrial areas, for instance, produce a large amount of background noise that could mask the noise from an APO, while the same noise level in a rural or residential area would be jarring and disrupt the quality of life for those living in proximity to the APO.

For those working within the APO, the Mining Health and Safety Administration (MSHA) has instituted a set of rules for maintaining safe noise exposure levels.

"Noise is one of the most pervasive health hazards in mining. The National Institute for Occupational Safety and Health (NIOSH) has identified occupational noise-induced hearing loss as one of the ten leading work-related diseases and injuries. MSHA estimated that 13% of the mining population of the United States (about 37,000) would develop material hearing impairment during their working lifetime under the previous noise standards.

Prolonged exposure to hazardous sound levels over a period of years can cause permanent, irreversible damage to hearing. Hearing loss may occur rapidly under prolonged exposure to high sound levels, or gradually when levels are lower and exposures less frequent. An individual may not notice hearing impairment until after substantial hearing loss occurs. In addition to adversely affecting the quality of life, hearing impairment can jeopardize the safety and productivity of affected miners as well as those around them." [32]

[31] (Langer, Drew and Sachs 2004, 40)
[32] (Mine Safety and Health Administration 2000, 1-2)

Backup Beepers

Individual noises, ones that can be clearly identified above other ambient noise, stick out and cause additional disruption.[33]

In order to allow audible safety signals to be heard, the Occupational Safety and Health Administration (OSHA) requires that *"all bidirectional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn has to be maintained in operative condition"*. [34]

MSHA has comparable regulations for horns, backup alarms and automatic warning devices, outlined primarily in 30 CFR 56.14132 (Horns and backup alarms) and 57.14132 (Horns and backup alarms for surface equipment). [35]

This requirement, while essential for safety, complicates the process of reducing noise pollution by generating multiple unique sounds that are designed to be heard against the background noise of a mining operation.

In order to mitigate this adverse impact on those living near a mining or other industrial site, both OSHA and MSHA allow approved alternatives to back-up beepers. Allowance for alternatives is summarized as follows:

OSHA …." appreciates concern about unintended, adverse consequences to those living near construction sites from the use of the common ("beeper") type of alarm. We reiterate that the standard does provide flexibility to construction employers, both in terms of using other technology that is effective and in using observers/signal persons". [36] Alternatives include:

- "Duck Quack" or white-noise alarm. This alarm produces a directional hissing noise. The alarm volume adjusts automatically to the background noise, so as to not be any louder than necessary.
- "Smart Strobe" technology, which automatically increases in brightness during the day and decreases at night
- Rear-mount day/night camera system with in-cab monitoring
- "Smart Alarm" radar/doppler motion sensing system in the rear of a truck that warns both the driver and employees working within the vicinity of the vehicle whenever the truck is in reverse

[33] (Langer, Drew and Sachs 2004, 40)
[34] 29 CFR 1926.602(a)(9)
[35] 30 CFR 56.14132 (Horns and backup alarms) and 30 CFR 57.14132 (Horns and backup alarms for surface equipment)
[36] 29 CFR 1926.601(b)(4)

Structural Noise Mitigation

Limiting the noise from an APO is not only a matter of muffling the noise from earthmoving equipment and backup beepers, it is also a matter of the structural design of the APO and the permanent equipment that processes and conveys the rock. [37]

The selection of materials is key in the reduction of noise. Chute liners and screens made of rubber or urethane can dampen the sound of the rock hitting the sides of the conveyors as they move rock around the facility. Acoustical enclosures can also help reduce the noise from stationary equipment, these can take the forms of the walls of the quarry itself, the berms, landscaping, natural vegetation, or even the rock stockpiles themselves.

Additionally, properly positioning the access roads, adding in acceleration and deceleration lanes, and routing truck traffic through acoustical enclosures can all help mitigate the noise from trucking traffic as the trucks move through the facility.

Current Regulatory Schema

While noise complaints are lodged with the Texas Commission on Environmental Quality (TCEQ) about APO activity, neither TCEQ nor any other state agency has current statutory authority to hold APOs accountable to any measurable standards on the level of noise that permeates beyond the APO's property line. [38]

For the safety of those within the mining facility, MSHA defines an "Acceptable Exposure Level" (AEL) as 8 hours of time-weighted average (TWA_8) sound level of 85dBA. This integrates all sound levels between 85dBA and at least 135dBA [39], which would cause the same average hearing damage as running a blender for 8 hours. [40] It also defines the "Permissible Exposure Level" (PEL) as a TWA_8 of 90dBA, integrating all sound levels between 90dBA and 140 dBA. MSHA requires that all mining facilities "use all feasible engineering and administrative controls to reduce the miner's noise exposure to the PEL." [41]

While workers at a mining facility often wear dual hearing protection, the use of in-ear and over-ear hearing protection, "Section 62.130 of the rule requires all mine operators to use all feasible engineering and administrative noise controls to reduce miners' noise exposures within the PEL without adjustment for the use of hearing protectors." [42]

[37] (Langer, Drew and Sachs 2004, 41)
[38] Texas Commission on Environmental Quality, Submission to House Interim Committee on Aggregate Production Operations, September 23, 2020 (Texas Commission on Environmental Quality 2020)
[39] (Mine Safety and Health Administration 2000, 2)
[40] (iac acoustics 2020)
[41] (Mine Safety and Health Administration 2000, 3)
[42] *ibid*

MSHA requires that monitoring take place on site in the form of either sound level meters (SLM), [43] or with a personal noise dosimeter, [44] which is worn on the person of a worker and monitors their individual noise exposure. [45]

Texas municipalities have set their own limits on the noise in residential and industrial areas. Houston sets a 65 dB residential limit for daytime and 58 dB limit for nighttime, with a nonresidential limit of 68 dB. [46] San Antonio sets a residential limit of 63 dB, a business limit of 70 dB, and an industrial limit of 72 dB. [47] Dallas sets a residential limit of 56 dB with all other areas ranging from 63-70 dB. [48]

Recommendations

APOs should monitor the noise exposure at their property line, keeping the noise level at their property line below 65 dB if the property line is within 880 yards of a residential area, school, or house of worship, and 70 dB if not.

While MSHA's regulations work to protect those working within an APO, the specifics of their regulations leave holes that could put the public at risk of hearing damage and cause disturbances to the peace of a nearby neighborhood. Acoustic enclosures that block workers from noise exposure within the facility would fit within MSHA standards but could do little to nothing to block the sound from impacting a nearby residential or commercial area.

[43] comprised of a microphone, amplifier, frequency response networks, and some kind of indicating meter and measure the sound level in a specific location
[44] comprised of a microphone, and a microprocessor-controlled monitor
[45] (Mine Safety and Health Administration 2000, 8)
[46] Hous., Tex., Code of Ordinances ch. 30, § 30-5 (2011)
[47] San Antonio, Tex., Code of Ordinances ch. 21, art. III, div 1, § 21-52
[48] Dallas, Tex., Code of Ordinances vol III, ch. 51A, §51-6.102

2. Light Pollution

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

"Outdoor light pollution is the alteration of light levels in the outdoor environment (from those present naturally) due to man-made sources of light." [49] When that change to the natural environment is wanted, such as to provide illumination in front of a moving car, it can produce a generally beneficial result. However, when that change to the natural environment spreads beyond the place where it is intended, it can produce negative consequences, even for something as simple as light.

Light is made up of particles called photons. When a light source, like a light bulb, emits light, it is producing photons that bounce off of objects, including molecules in the air. While all light travels at the same speed, the amount of energy the photon has determines how quickly it vibrates back and forth while it is traveling. The distance it travels between vibrations is known as it's wavelength, the more energy the light has, the shorter its wavelength. [50]

When a photon hits the receptors in the back of a human eye, the eye absorbs that light and sends a signal to the brain. The brain assembles all those signals into an image. The eye interprets the color of the light based on its wavelength. Longer wavelengths (lower energy) are interpreted as red light, while short wavelengths (higher energy) those around 500nm, are seen as blue light, with the other colors falling in a spectrum between the two ends.

What we see as white light is actually just a mix of lights from across the short to long spectrum. As the beam of white light spreads out, it separates out into all of the colors that make it up. When this happens in an organized way, like in a prism or from traveling though rain drops, you can see the rainbow effect as all the visible colors of light are separated out at once.

When light scatters, it separates out, illuminating a wider area, but the beam won't travel as far. Think about a beam of light like a gallon of water, if you put the water in a neat orderly line, like in a garden hose, you could spray the water out in a straight line and make it go much farther than

[49] (Hollan 2008, 3) This definition uses the broader, and more technical definition of "pollution", which does not differentiate tolerable changes to the environment from those that have harmful effects. Using this definition allows the discussion to become about the level of light pollution in an environment that is acceptable, rather than about when the term "pollution" should be applied.

[50] (Brainard, G.C., et al. 2001)

if you dumped it onto the ground. It's the same amount of water, but the way it disperses determines what gets wet.

Blue light, with more energy, scatters more than red light (lower energy), so when a beam of white light scatters the blue light acts like water being dumped out of a bucket, scattering all around the area it hit, while red light acts like water coming out of a hose, scattering less and traveling further. This is why the daytime sky is blue. [51] As the white light from the sun hits the atmosphere it scatters out, and we see more of it than the shades of red. In the evening, when we stop getting new light, the blue scatters out and the redder shades have stuck around, since they didn't scatter as much.

Since it makes up the daytime sky, our eyes use blue light to tell the brain if it's day or night. The bluer the light the eye detects, the more the pupil contracts, reducing the overall amount of light able to enter the eye. [52] At night, even a small amount of blue light can make it much harder to see. It can also disrupt sleep patterns in humans and animals, as even a small amount of it can suppress production of the hormone melatonin, which regulates sleep-wake cycles. [53]

Human eyes are adapted to pick up shorter wavelengths of light more easily in dark conditions. In a relatively dark area, like a suburban neighborhood or rural area, eyes can become dark adapted more so than they would in an urban area, increasing their sensitivity to the blue light that comes out of white light sources. As a result, "the brightness of the sky glow produced by artificial lighting can appear 3–5 times brighter for blue-rich light sources as compared to HPS lamps and up to 15 times as bright as compared to Low Pressure Solium Lights (LPS)" [54]

In practical terms, this means that a person living next to an APO that uses lights that produce blue light will experience a lot more light pollution at night than if the APO were using orange lights like Hight Pressure Sodium lamps (HPS). [55]

As stated by the International Dark-Sky Association (IDA), it is "important to recognize that all white light sources are not the same: some radiate much more energy than others in the blue portions of the spectrum. Concurrent with the developments in human vision research, there is growing evidence for adverse impacts associated with wavelengths shorter than about 500 nm." [56] Studies have shown that light from a white LED scatters 1.2 to 2 times as much as light emitted by a High-Pressure Sodium (HPS) lamp.

"Though the impact of blue-rich light decreases with distance more rapidly than that of yellow-rich sources, this decreased impact arises from the scattering of short-wavelength light out of the light beam in the areas nearer to the cities. In other words, the decreased impact at greater distances is at the expense of increased impacts nearby. For clear atmospheres, less light is scattered overall,

[51] (International Dark-Sky Association 2010, 5)
[52] (International Dark-Sky Association 2010, 9)
[53] (Brainard, G.C., et al. 2001, 21)
[54] (International Dark-Sky Association 2010, 14)
[55] (International Dark-Sky Association 2010, 6)
[56] (International Dark-Sky Association 2010, 1)

but the impacts are spread over a larger area; for hazier atmospheres more light is scattered, so the overall impacts to sky glow are larger and more strongly concentrated near the light sources." [57]

APOs tend to have a higher level of dust production than other industries, as will be discussed in the Air Quality section of this report. That level of dust increases the level of scattering of blue light in areas nearby, so any blue light used by an APO will scatter out of the beam of white light rapidly, produce less illumination on its intended target, and instead produce a brighter, and more disruptive, nighttime skyglow for those living nearby an APO facility.

Current Regulatory Schema

While most APOs will perform the majority of their operations during the day, when there isn't much need for man-made lighting, the maintenance and repair of equipment that must be done regularly has to wait until the hours in which the production machinery is not in operation. [58] For all work done under dark conditions, MSHA requires that "Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and work areas." [59]

This is a broad and lenient standard designed to give APOs the flexibility to adjust to their specific needs. [60] However, it does not cover how an APO should deal with the light pollution that spills over beyond their facility and can cause disruption to sleep patterns of those living nearby and decrease the visibility of the night sky in areas where tourism relies on the ability for visitors to see stars at night.

Ensuring that worker safety procedures are compliant with MSHA safety requirements, while also selecting technology that prevents as much spillover of light pollution as possible, should be the night-time illumination goal for APOs.

There are no current statewide requirements regulation APO lighting. However, current law provides some regional lighting restrictions based on specific needs that could be instructive.

Subchapter B of the Texas Local Government Code chapter 240 provides that on the request of a United States military installation, base, or camp commanding officer, the commissioners court of a county, any part of which is located immediately adjacent to the installation, base, or camp, may adopt orders regulating the installation and use of outdoor lighting within five miles of the installation, base, or camp in any unincorporated territory of the county. [61]

Comal County Commissioners Order No. 367 dated 01/07/16, amended Order No. 199 (Camp Bullis Dark Sky Zone" Order No. 3671) [62] for regulation of outdoor lighting in the unincorporated

[57] *ibid*
[58] (O'Dell 2020)
[59] 30 CFR 56.1700
[60] (O'Dell 2020)
[61] Tex. Loc. Gov't Code Ann. § 240.032
[62] Comal County, Tex. Commissioners Order No. 367 (01/07/16)

areas of Comal County, Texas within 3 miles of the Camp Bullis boundary. This ordinance requires "all regulated outdoor lighting shall be installed …as to minimize or eliminate glare and light trespass….". ……. shall be International Dark Sky Association (IDA) approved products….".

The 86th legislature HB 4158[63] by Representative Zwiener, under Subchapter B, Chapter 351, Tax Code, amended by adding Section 351.10692, outlines a Dark Sky provision for Hays and Blanco County. This legislation recognizes the importance of dark skies to visitors and residents of the Hill Country and allows communities to use hotel occupancy tax funds to incentivize updating outdoor lighting. [64]

House Bill 2857[65], approved in 2011, instructed seven counties around the McDonald Observatory in West Texas to adopt outdoor lighting ordinances. The Act took effect beginning on January 1, 2012, now Texas Local Government Code §§229.051-229.054. [66]

A number of Texas cities including Wimberley, Dripping Springs, Horseshoe Bay, Blanco, Johnson City, Mason, San Angelo, and West Lake Hills have passed Dark Sky ordinances. Several have achieved certification and are known as dark sky communities. [67]

Additionally, while not a regulatory agency, the IDA, in association with the Illuminating Engineering Society (IES) has produced a set of guidelines to minimize the negative effects of light pollution. They indicate that lights should only be on when needed, only light the area needed, be no brighter than necessary, minimize blue light emissions, and be fully shielded (pointing downward).

Recommendations

APOs should be held to IDA and IES standards for outdoor industrial lighting

IDA and IES standards have specific parameters for outdoor lighting of industrial areas designed to both fit within OSHA and MSHA's standard for safety when operating an industrial facility and minimize light pollution into the surrounding areas. The legislature should require that an APO, when applying for any standard permit for equipment, indicate that all outdoor lighting at their facility is compliant with IEA standards. Legislation should also assign a fine to be assessed if, in an investigation following a complaint, TCEQ determines that outdoor lighting within the facility is not within IES standards.

[63] Tex. H.B. 4158, 86th Leg., R.S. (2019)
[64] Subchapter B, Chapter 351, Tax Code, amended by adding Section 351.10692
[65] Tex. H.B. 2857, 82nd Leg., R.S. (2011)
[66] Texas Local Government Code § 229.051-229.054
[67] (Hill Country Alliance 2020)

3. Transportation of Aggregate Material

Committee Action

The committee received written testimony from the Texas Department of Transportation (TxDOT), the Texas A&M Transportation Institute (TTI), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public on the question of how the transportation of aggregate products impacts those living in surrounding areas. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

Rapid growth in Texas requires increasingly larger amounts of APO products: aggregate, sand, asphalt and concrete. A large number of heavy trucks and rail cars are needed to move the APO products to the user, resulting in an increase in heavy truck traffic in areas around APOs. [68]

Truck traffic has doubled in some areas, and in many locations this heavy truck traffic is forced to use load-limited rural and farm-to-market roads for ingress and egress to the APO operations, causing rapid deterioration of our road infrastructure and a non-sustainable situation.

One truck carries 10 cubic yards of product, meaning that a facility operating at the maximum rate of 300 yd^3/hr or 6,000 yd/day will be visited by 30 trucks an hour or 600 trucks a day. This rapidly deteriorates limited capacity area roads because maintenance and repair work are short-lived. In some urban areas like Houston, Commercial Vehicles (CMVs) use load-limited roads in residential areas and unincorporated areas of the county.

Safety

In 2019 CMVs were involved in 7% of all accidents (59,295) but were involved in 18% of all fatal crashes (655), and 9% of serious injury crashes (1,124). [69] Texas Department of Public Safety (DPS) employs 484 State troopers capable of performing roadside inspections of CMVs, with 144 civilian inspectors certified to inspect at roadside and border facilities, and 78 civilian investigators performing audits of commercial motor carriers.

With an ever-increasing population, and a limited budget for enforcement on commercial vehicle safety, it is essential that Texas take every step possible to preserve the safety of our roads, especially in the places drivers gain access to and egress from state highways.

[68] It is worth noting that air pollution emissions from vehicles, including PM emissions, are not accounted for in APO permits. On-site diesel vehicles can contribute significantly to local PM. Heavy diesel trucks can contribute 0.2 grams of both PM2.5 and PM10 each per mile driven. Idling trucks can potentially be worse. https://tinyurl.com/nepisdieselemissions

[69] (Rundell 2020)

When any residential, commercial, governmental, or industrial facility wishes to build an access route onto their property from a roadway on the state highway system, they must first submit a plan to the Texas Department of Transportation (TxDOT), outlining what their business will be, and what kind of traffic they expect will be coming and going from their location. TxDOT then conducts a traffic impact analysis to determine what kinds of ingress and egress methods will be needed. [70] Once TxDOT has determined what will be needed, the applicant makes a donation to TxDOT covering the cost of the on-system improvements.

For an APO the majority of the traffic will be from CMVs arriving empty and transporting the aggregate out of the facility. If an APO has a standard driveway that requiring a 90-degree turn, that requires the CMV to come nearly to a complete stop as it enters the facility and allows little chance to enter onto the highway at a safe speed for merging back into traffic.

However, when an APO has a deceleration lane, the CMVs have a long runway where they can exit the highway at full speed and slow down by the time they enter the facility. Likewise, when an APO has an acceleration lane, the CMVs can get up to highway speed before merging into traffic. Acceleration lanes can also come with the advantage of placing bumps in the road designed to help shake off the excess dust from the aggregate and prevent it from clouding the vision of the other drivers on the road.

Despite the massive safety benefits from acceleration and deceleration lanes, TxDOT's current formulas allow APOs to build the less expensive, but more dangerous 90-degree driveways. Often this can be designed into the layout of the APO facility by only purchasing enough road-accessible land which balloons outward once the property line is away from the road. This design only allows for a standard driveway, rather than acceleration and deceleration lanes.

Additionally, TXDoT often approves 90-degree driveways plans based on an APO's initial demand level. As has often been the case, the initial demand increases without any additional regulations. While TxDOT attempts to account for potential increases in traffic, if those projections change after the initial construction of the driveway, the only enforcement mechanism allowed to TxDOT under current law is condemnation though the use of eminent domain. [71]

It should also be noted that the dust and small rocks coming off of trucks causes windshield damage and obscures the vision of nearby drivers. The placement of roadway bumps leading up to acceleration lanes would help shake off the dust and smaller rocks from the trucks before they make their way onto the highway.

[70] (Lee 2020)
[71] Tex. Transp. Code § 203.031

Pavement Consumption

Overview

Texas's rapid growth and economic expansion has required a drastic increase in the number of commercial trucking vehicles needed to move goods and raw materials across the state.

Unlike cars and personal trucks, these higher weight capacity vehicles destroy the pavement's structural integrity. [72] The costs of repairing the damage and replacing the destroyed pavement have outpaced the revenue generated from taxes on diesel fuel and commercial truck registration fees.
There are two ways that we "consume" our pavement infrastructure.

1. Capacity – Passenger and Commercial vehicles take up the available room on road surface, requiring more roads to be built to handle the number of vehicles.

2. Integrity – Vehicles press down on the road surface, that pressure breaks down the integrity of the pavement. When a car or truck drives over a road, it pushes down on the surface with an average weight of 4,021 pounds spread out over four tires, for an average of 1,005 pounds/tire. [73]

When a commercial vehicle carries its maximum permitted weight of 80,000lbs, that weight is spread out over 18 tires for an average of 4,444lbs/tire. Over four times the direct downward pressure.

At these levels of pressure, the road surface begins to sustain damage not caused by lower pressures even over a long period of time. Think of an egg: you could tap the eggshell lightly with your fingernail and not actually crack the shell open, but with more pressure, the shell easily cracks. The physics of pavement operate in the same way. One commercial truck does, on average, 400 times the damage of a passenger car tire. [74] According to TXDoT, "If all commercial traffic were to cease, Texas pavement life would then be limited only by environmental and soil conditions." [75]

Current Funding Mechanisms

Texas primarily funds its roads through a gas tax of $0.15/gallon, [76] along with vehicle registration fees, vehicle sales tax, and a tax on vehicle rentals. This funding, which has remained unchanged since 1991, makes up the budget to maintain a level of both capacity and integrity sufficient to support the rapidly growing Texas economy. However, studies have shown that the level of damage to the integrity of our infrastructure by commercial vehicles far outpaces the funding they

[72] (Newcomb 2020)
[73] (Hakim 2004)
[74] (Newcomb 2020)
[75] (Lee 2020)
[76] Total gas tax of $0.20, split between Transportation (75%, $0.15) and Education (25%, $0.05)

provide, which diverts funds away from the capacity improvements also demanded by the growing economy.

In a 2012 study, the Center for Transportation Research (CTR) looked at this question through the lens of the extra damage done by trucks weighing in excess of 80,000 pounds. [77] They found the following:

Commercial Trucks with 5 axles (commonly referred to as 18-Wheelers) typically run with a fuel economy of 5 miles/gallon on average. At $0.15/gallon the math works out like this:

$$15\ ¢/\text{gallon} \div 5\ \text{miles/gallon} = 3¢/\text{mile}$$

CTR then looked at the rate at which commercial trucks consume the integrity of pavement. Though their work is too complex to display in this summary, the average rate of pavement consumption across Texas for an 80,000-pound, 5-axle vehicle was $0.26/mile, not including bridges and overpasses.

With this number we can find how far current funding mechanisms fall short:

$$\$0.26/\text{mile} - \$0.03/\text{mile} = \$0.23/\text{mile}$$

On average, Texas loses $0.23 for every mile driven by a fully loaded commercial vehicle. This loss is a combination of the funds diverted away from capacity improvements, and the degradation of out pavement integrity. Both of these amount to a subsidy being paid out by Texas to the industries that utilize the roads to transport their goods and raw materials.

CTR calculates that the total subsidy paid out for just the small fraction of trucks that run with special Oversize/Overweight Permits was $559,689,428 in 2011, even after they paid the additional permit fees associated with the larger weight classes.

The shortfall does not come from the fact that our gas taxes have not been raised since 1991; it comes from the fact that gas used does not correlate to damage done to the pavement integrity. In order to eliminate the subsidy, the funding mechanism must follow the cost assumed.

Recommendations:

Safety

Change TxDOT protocols to allow for an agreed upon change to a driveway should traffic conditions change.

For industrial facilities that vary greatly in their expected traffic levels, and facilities in high growth areas, TxDOT should be allowed to require not only a set of conditions for the initial driveway to be built, but a secondary design that the landowner or leaseholder would be required to construct at a later time, should their individual traffic flow, or the overall traffic flow, meet certain

[77] (Prozzi, et al. 2012)

conditions.

Require that new APOs have enough right of way purchased to construct acceleration or decelerations lanes.
An APO should not be able to dictate their own driveway construction through strategic land purchasing. Since there is a possibility that an APO would need to have acceleration and deceleration lanes, a new APO wishing to gain access to a state highway should have to purchase enough land to construct them prior to being able to submit an application to TxDOT.

Pavement Consumption

Commission a study to establish a Pricing Model for Pavement
Not only does this allow the resulting charge to be itemized and billed to the customer directly, it also tells TXDoT exactly how much damage was done to roads owned by each county, city, and other districts responsible for road construction and repair. TXDoT can then report to the Comptroller exactly how much of the Pavement Consumption Charge should go to each of those entities.

Potential Benefits

- As the number of electric and other alternative fuel vehicles increases, their lack of contributions to transportation funding will become more of an issue. By changing from reliance on a gas tax, we also rely less on gas as a means to fund infrastructure.
- Asking taxpayers to provide an average of $0.23/mile subsidy to commercial trucking opposes Texas' success. This is especially true of the portion of the subsidy that comes from taxpayers dealing with broken roads and the damage caused to their vehicles. Ending this subsidy will benefit all Texans and allow for the true price of commercial trucking to be calculated and applied appropriately.
- The need for special permits for oversized commercial vehicles comes from their additional destruction of pavement integrity while still only paying the same $0.15/gallon tax as other vehicles, without using that much more gas. If, instead of limited permits for overweight vehicles, we simply charged the properly adjusted pavement consumption rate per mile, their disproportional effect on the infrastructure could be mitigated or eliminated due to the additional revenue collected being used to repair the damage.
- Cities and counties in Texas have roads that they are responsible for maintaining. When the revenue from gas taxes does not compensate for the damage done by vehicles, that does not change the fact that the roads must be repaired. For cities and counties, that subsidy comes from their property tax revenues. If we want to provide property-tax relief, one way is to reduce the number of items for which cities and counties in Texas must rely upon property tax revenue.
- Many recent efforts to increase transportation funding have focused on individual industries that make up a large part of the commercial trucking in specific areas: Oil & Gas in West Texas, mining and concrete in Central Texas, and international shipping in Houston. Each of those solutions only tackles one subset of the problem at a time. The Pricing Model for Pavement, however, would not only provide a solution for the impacts

> of these specific industries, but for the cumulative impact of all commercial trucking in the state as well. By making the system one that holds everyone responsible for their consumption of our infrastructure—no matter how big or small—we avoid punishing one industry while subsidizing another.

A study commissioned by the legislature to determine the feasibility and potential method of implementation for such a program would go a long way to helping solve the problem of pavement consumption faced not only by those living near APOs, but for all Texans as well.

4. Air Quality

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public regarding APO's impact on air quality for those living in surrounding areas. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

According to TCEQ, *"In order to protect against high levels of potentially harmful particulates, the TCEQ follows air quality standards from the National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (EPA) as directed by the Federal Clean Air Act (FCAA). These standards apply to six outdoor air pollutants; ground-level ozone, lead, nitrogen dioxide, carbon monoxide, sulfur dioxide, and particulate matter (PM), which includes all dust and similar matter larger than 10 micrometers (PM_{10}) and 2.5 micrometers or less ($PM_{2.5}$)."* [78]

While "dust" is often a nuisance issue, it also carries the potential for causing health concerns as well, both to those working at the APO and to those living nearby. [79] The dust released by an APO typically consists of particles released from the blasting, excavation, transportation, aggregate processing and sizing of material, and stockpiling of exposed rock. As such, the chemical composition of the crushed rock could pose a health risk to those living near an APO if the rock being processed contains potentially harmful materials. Other APOs such as concrete batch plants may also release toxic metals from material used in their production, e.g., fly ash. [80] [81] [82] [83]

Health Effects

PM_{10} and $PM_{2.5}$ are invisible particles that are small enough to penetrate the delicate lining of the respiratory system following inhalation. The health effects of inhalable PM are well documented. Health risks are due to exposure over both the short term (hours, days) and long term (months, years). PM health impacts dwarf all other pollutants from a cost perspective. In Texas cities ozone health impacts range in the hundreds of millions of dollars, but PM health impacts range into the billions. This has been shown in one industry after another including, e.g., coal use. [84]

[78] (Texas Commission on Environmental Quality 2020)
[79] (Langer, Drew and Sachs 2004, 38)
[80] (American Coal Ash Association 2003)
[81] (U.S. Federal Highway Administration 2016)
[82] (Physicians for Social Responsibility 2010)
[83] (U.S. Environmental Protection Agency 2014)
[84] (Strasert, Teh and Cohan 2019)

Short-term exposure can result in coughing, shortness of breath, tightness in the chest and irritation of the eyes. Long-term exposure can result in reduced lung function, and respiratory diseases such as asthma, chronic obstructive pulmonary disease (COPD), diabetes, [85] emphysema, impairment of brain development, [86] low birth weight, [87] lung cancer, stroke, [88] aggravation of existing lung disease, and death. [89] OSHA, MSHA [90] [91] and other agencies responsible for worker health continue to reduce allowable exposure levels for labor; these same reduced exposure levels should be applied to the general population as well.

Long term exposure is also associated with increased risk of allergies, cardiovascular disease and autoimmune disease. PM exposure affects health adversely such that there is increased absence from school and work, increased visits to emergency room and doctors' offices, and hospitalization.

One of the most concerning elements are those rocks containing specific types of respirable crystalline silica in high concentrations. Silica can be noncarcinogenic when not in a crystalline form that can be inhaled by those working or living near a processing facility. [92] When high concentrations of crystalline silica are inhaled, usually due to overexposure, severe respiratory conditions like silicosis can develop.

Respirable crystalline silica can be at high or low concentration, it is the long term or short-term exposure that will create health problems. The amorphous form of silica is just as concerning as it is also damaging to the respiratory system as is any form of dust particle including silica fume, fly ash, [93] or metals also found in APO production.

In addition to silica, the possible presence of asbestiform minerals is of concern as well. Asbestos is only found in formations that also contain silica and is not found without silica present. According to Langer et. al., *"Only a few metamorphic rocks, even those containing silica and magnesium, contain asbestos mineral. Therefore, an unaltered sedimentary rock, such as high purity limestone, has neither the ingredients nor the geologic origin that promotes the creation of asbestos minerals. In areas where all the geologic conditions exist, an examination of the quarry reserves for the presence of asbestos is prudent."* [94]

A recent TCEQ study has shown that levels of silica from APO production in Texas are below NAAQS levels, that APO production in Texas do contribute to the levels of respirable silica,

[85] (He, et al. 2017)
[86] (Brockmeyer and D'Angiulli 2016)
[87] (Bell, et al. 2011)
[88] (Zhang, et al. 2018)
[89] (EPA New England n.d.)
[90] (Mine Safety and Health Administration n.d.)
[91] 29 CFR 1910.1053
[92] *ibid*
[93] (U.S. Federal Highway Administration 2017)
[93] (Physicians for Social Responsibility 2010)
[93] (U.S. Environmental Protection Agency 2014)
[94] (Langer, Drew and Sachs 2004, 40)

particles below 4 micrometers. [95] However, those studies were conducted with meters placed up to 1 mile from the APO facilities measures, more than 4 times the distance APOs are currently required to place between an incoming facility and residential areas, schools, hospitals, and houses of worship.

Nuisance Dust

In addition to the health effects of PM exposure, the larger particles of dust distributed into the air by APOs cause a number of effects detrimental to quality of life for those living around APO facilities. Dust covering roadways and blocking vision, covering homes and plants, and generally disrupting the aesthetics of the local air quality greatly restrict the desirability of the area for potential residents and suppresses tourism to areas whose natural beauty and clear skies is a main draw.

However, as visible dust particles are much larger than the particles of PM_{10} and $PM_{2.5}$, the techniques used to suppress PM_{10} and $PM_{2.5}$ to EPA permitted levels will also capture the larger particles and reduce them to acceptable levels, if used correctly. [96] In other words, holding APOs to the PM_{10} and $PM_{2.5}$ standards would also yield a significant reduction in nuisance dust. If water spray and surfactants are not applied properly, particles can escape undetected. In addition, nano particles are not necessarily captured by conventional dust mitigation systems.

Current Regulatory Schema

PM_{10} and $PM_{2.5}$ include commonly occurring air pollutants that can cause health, environmental, and property damage, including crystalline silica and asbestos. National Ambient Air Quality Standards (NAAQS) are nationally accepted standards for agreed-to concentrations of PM_{10} and $PM_{2.5}$ and are reviewed and revised every five years by the EPA. [97] However, the EPA last revised NAAQS in 2013, putting them at least two years behind their current revision deadline at the time or writing.

TCEQ operates a number of air monitoring stations designed to comply with federal ambient air monitoring rules for all six pollutants, not only PM_{10} and $PM_{2.5}$. The network is designed to monitor regional air quality and determine if it meets NAAQS standards. It is not intended to measure emissions from an individual source or determine if a particular industrial operation is in violation of its permitted emission levels. There are relatively few particulate monitors operating 24/7/365, and most are not properly located to collect APO particulates and mass background concentrations.

A person planning to construct a new facility or modify an existing facility that may emit air contaminants must obtain an air permit from the TCEQ for each piece of equipment requiring a permit before any work on the facility involving that equipment begins. TCEQ must deny the

[95] (Texas Commission on Environmental Quality 2020, 5)
[96] (O'Dell 2020)
[97] 42 USC s. 7409(d)(1)

permit for new construction or modification if the applicant fails to submit information demonstrating that it will satisfy all applicable permit conditions, including distance limitations[98]. If the application is administratively complete, however, TCEQ lacks the authority to deny the permit. [99] There are five options [100] available to a person seeking authorization for new construction or modification:

De Minimis Permit

A permit for new construction or modification is not required for facilities that either (1) are included on the "De Minimis Facilities or Sources" list maintained by TCEQ, or (2) meet certain emissions caps or other conditions established in state regulations [101]. There are no distance limitations for de minimis facilities. [102] [103]

Permit by Rule

A facility that does not meet the de minimis criteria but will not make a significant contribution of contaminants to the atmosphere may be eligible for a permit by rule (formerly known as a standard exemption)[104]. TCEQ regulations now authorize permits by rule for over 100 types of facilities via permits by rule[105]. Examples range from less complex domestic "comfort heating" facilities and food processing facilities, to more complex oil and gas handling and production facilities. To qualify for a permit by rule, a facility must satisfy both general conditions applicable to all facilities permitted by rule, and special conditions that apply to that particular type of facility. There are a number of special distance limitations applicable to facilities permitted by rule.

Standard Permit

Standard permits are an option for specific, well-characterized classes of facilities that are similar in terms of operations, processes, and emissions. [106] To be eligible for a standard permit, a facility must satisfy both general conditions and special conditions.[107] The special conditions often include distance limitations. Standard permits and related conditions for the following five classes of facilities are codified in state regulations:

certain oil and gas facilities, [108]

municipal solid waste facilities and landfill stations, [109]

[98] Tex. Health & Safety Code § 382.0515, 382.0518; 30 Tex. Admin. Code § 116.110

[99] Tex. Health & Safety Code § 382.0518(b)

[100] 30 Tex. Admin. Code § 116.110(a).

[101] Tex. Health & Safety Code § 382.05101; 30 Tex. Admin. Code § 116.119.

[102] A complete list of facilities that the TCEQ has deemed to be "de minimis" is available here: https://www.tceq.texas.gov/permitting/air/guidance/newsourcereview/list-of-de-minimis-facilities.html

[103] De Minimis permits have received criticism for a perceived tendency to understate the true background concentration levels for permit applications, causing defective modeling and potentially misstates the true levels of any pollutant.

[104] Tex. Health & Safety Code § 382.051(b)(4), 382.05196.

[105] 30 Tex. Admin. Code § 106.1 to 106.534.

[106] Tex. Health & Safety Code § 382.05195; 30 Tex. Admin. Code § 116.601

[107] 30 Tex. Admin. Code § 116.615

[108] 30 Tex. Admin. Code § 116.620.

[109] 30 Tex. Admin. Code §§ 330.981-330.995.

landfill mining facilities, [110]
concentrated animal feeding operations, [111]
composting facilities, [112]

TCEQ has also issued "non-rule" standard permits for additional classes of facilities, where the permits and applicable conditions are not codified in state regulations. [113] The "non-rule" standard permits that TCEQ has issued to date can be downloaded from TCEQ's website. Table 1 includes the distance limitations that apply to the five classes of facilities eligible for standard permits codified in state regulations. Distance limitations for some facilities are eligible for "non-rule" standard permits, namely, concrete batch plants, rock and concrete crushers, hot mix asphalt plants, and oil and gas handling facilities.

Flexible Permit

A flexible permit allows an owner or operator of multiple facilities located on one or more contiguous properties leeway to make physical and operational changes to the facilities without the need to seek a permit amendment or a new permit. [114] To be eligible for a flexible permit, the owner or operator must comply with a pollutant-specific emission cap for all facilities covered by the permit, or separate emission limitations for each individual facility covered by the permit. [115] Additionally, the owner or operator must comply with general conditions applicable to every flexible permit. [116] In considering whether to issue a flexible permit for facilities located within 3,000 feet of a school, TCEQ must consider possible adverse effects on individuals attending the school. [117] Additionally, there are specific distance limitations that apply to certain types of facilities covered by a flexible permit. [118]

New Source Review Permit

New Source Review (NSR) permits are required for the construction or modification of any facility that does not meet the requirements for a de minimis authorization, permit by rule, standard permit, or flexible permit. [119] [120] Unlike standard permits, which apply to a general class of similar facilities, NSR permits are case specific. As with the other permit types, a facility must satisfy both general and special conditions of the NSR permit. [121] NSR permits include a limited number of facility-specific distance limitations for the site.

[110] 30 Tex. Admin. Code § 330.607
[111] 30 Tex. Admin. Code § 321.43
[112] 30 Tex. Admin. Code § 332.8
[113] 30 Tex. Admin. Code § 116.601(a).
[114] 30 Tex. Admin. Code §§ 101.1(1), 116.710(a).
[115] 30 Tex. Admin. Code § 116.715(b).
[116] 30 Tex. Admin. Code § 116.715(c).
[117] 30 Tex. Admin. Code § 116.711(2)(A)(ii).
[118] 30 Tex. Admin. Code § 116.722.
[119] Tex. Health & Safety Code § 382.0518(a); 30 Tex. Admin. Code §§ 116.110, 116.111.
[120] Most flexible permits are for large petrochemical facilities and are intended to serve as NSR permits for the purposes of federal Clean Air Act compliance.
[121] 30 Tex. Admin. Code § 116.115

[122]

Recommendations:

Require on site monitoring of PM_{10} and $PM_{2.5}$

TCEQ's testimony and response to requests for information make it clear that they are in complete compliance and properly enforcing the letter of the NAAQS by effectively monitoring regional air quality.

However, testimony from those living near APOs who have been affected by the decline in air quality demonstrates that the current regulations and funding only allowing for regular regional air quality monitoring is insufficient to provide an effective system to hold accountable APOs whose PM output is beyond what would cause the air near their facility to exceed EPA standards.

At the current time, the TCEQ does not know what the actual, real-time particulate concentrations are in the air near APOs. This area includes schools, hospitals, churches, and homes that are in many cases located less than one-half mile away from APOs. [123]

For example, the TCEQ has data collected over the past 4-12 months from five air monitors deployed in populated areas downwind of APOs in New Braunfels, San Antonio, southern Bexar County, Atascosa County, and Jarrell. Based on that data, measured concentrations have been well below the federal air quality standards and are consistent with background PM levels.

However, while the TCEQ is committed to continuing its collection of PM data and will evaluate data in accordance with federal standards, the placement of these monitoring stations followed federal guidelines and only monitored regional air quality after there was a chance for dispersal, and not at the actual property line of any APO. With the rate at which PM_{10} and $PM_{2.5}$ precipitate out of the air, NAAQS's focus on regional air quality provides neither sufficient data for ensuring the air quality of those living adjacent to an APO, nor the means for holding individual APOs accountable for their output of PM_{10} and $PM_{2.5}$.

The 87th Texas Legislature should enact legislation to require that APOs place gravimetric or light scattering PM monitors on property lines as a prerequisite to the approval of an air quality permit for any piece of equipment requiring one. Additionally, APOs should purchase equipment approved by TCEQ and in a quantity determined by the size of the operation, and require that the

[122] The TCEQ states that the current monitoring program is regional and not designed to specifically measure particulates near APO facilities. However, the data from these monitors is used for modeling NSR permits This data is often taken from monitors located long distance from the New Source and does not provide accurate data for modeling to obtain the true background concentration data for those areas closer to the New Source than the monitor.
[123]A conflicting study has shown PM levels close to an APO as far exceeding NAAQS. (Collins, Chong and Armour 2018, Collins, Chong and Armour 2018)

data from those monitors be kept on hand in case of a complaint, [124]greatly simplifying the process of air quality investigations. For example, rather than having to spend weeks setting up their own equipment to check for a future violation from an APO, TCEQ staff can simply request a copy of the monitoring data and examine it to see if the air quality around the facility exceeded NAAQS on the day in question, saving both TCEQ and APOs a great deal of time and resource expenditure.

Residents deserve to breathe healthy air all of the time, and monitoring must be adequate to demonstrate that this standard is met.

Commission a study to determine the cumulative effect of multiple PM sources each outputting what would be compliant levels of PM_{10} and $PM_{2.5}$ were they the only source.

While the EPA standard is not the focus of this report, it is based on an acceptable total level of PM_{10} and $PM_{2.5}$. While individual APOs may be fully compliant with state permit requirements at their property line, it is possible that, when multiple APOs locate within 3 miles of one another, the cumulative effects of their PM_{10} and $PM_{2.5}$ output could place those who live nearby in a position of having their air quality diminished to unacceptable levels when those outputs converge.

Given the high "place value" of aggregate, and the need of CBPs to locate near construction projects, especially roads and TXDOT projects, when a valuable deposit of the necessary minerals is found in an area of high demand, the APO industry begins to converge on one small area, resulting in the possibility of their PM_{10} and $PM_{2.5}$ outputs merging. This merits more study, and the committee recommends that the 87th Texas Legislature commission such a study from the TCEQ.

TCEQ's Public Meeting process for Standard Permits on APO equipment should include members from other agencies whose areas of expertise are heavily impacted by APOs.

Public Meetings for TCEQ Standard Permits are currently restricted to the permit itself and the strict parameters of the air quality concerns in question. Those who come to the public meeting with related questions about water quality, light pollution, or other areas of concern related to the planned facility, are most often told that their questions are outside the scope of the meeting and cannot be answered.

While this is understandable on the part of the TCEQ employees holding the meeting, whose expertise is focused on the area of air quality, it leads to a great deal of frustration on the part of the public, and often makes the meetings less functional than they would be if the questions were given an answer. With so few opportunities for the public to voice concerns about issues related to an APO coming into their area, the forum created by a TCEQ Air Quality public meeting presents an ideal convergence of interested parties to allow state agencies and local governments to address questions and concerns in their areas of expertise.

[124] As concerns around cost have been discussed, a market analysis has shown that equipment monitoring PM_{10} and $PM_{2.5}$ can be obtained for a cost of approximately $850/month per monitor if rented, with web hosting and data uploads covered, or purchased for roughly $20,000 each with 1-3 monitors per facility based on size. **Invalid source specified.**

The committee recommends that legislation be proposed requiring certain state agencies to provide representatives to attend a combined Q&A session during a TCEQ public meeting for an Air Quality Permit related to APO equipment. The TCEQ meeting agenda should be expanded, but not limited, to include the following.

- TXDoT – Questions and concerns often arise concerning public safety, road deterioration and changes to local traffic.

- Texas Water Development Board (or local Groundwater Conservation District) – Questions about local water supply often come up around APOs arriving in the community.

- Any appropriate agency not listed who would be needed to answer a question posed in the written questions submitted in advance of the meeting, with at least a 7-day notice.

TCEQ should also be required to invite the following to take part in the Public Meetings

- County Commissioner's Court – Issues can arise involving the county's authority over various aspects of the process.

- Municipal Authority (if any) – Municipalities are able to create and enforce ordinances for APO facilities with their municipal boundaries and extraterritorial jurisdiction.

While these agencies and local governments may not have anything to do with the TCEQ permit's approval, it would be overly burdensome on the residents to arrange multiple meetings for them to be able to ask their questions directly, and overly burdensome on agencies to repeatedly answer questions on an individual basis.

By holding a broad agency Q&A during TCEQ's official public meeting on the permit, the committee believes many of the communication-related issues surrounding APOs could be addressed more effectively.

5. Blasting

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

Why is blasting needed?

Earth moving equipment generally cannot dig all of the natural bedrock in a typical aggregate mine. Explosives are used in construction, quarrying, and mining to fragment rock layers so that the mechanized equipment can move it. Blasting operations break up limestone ore so that the ore can be transported to the crushing and processing facilities.

Why does blasting impact surrounding areas?

Although proper design controls the adverse effects outside the blast area from the use of explosives, nearby landowners and residents can generally feel the effects of blasting operations. When explosives are detonated in rock, two things happen. First, a shock wave is produced, and second, gas pressure is formed. The shock wave creates micro fractures around the blast hole; limited to a few diameters of the blast hole, generally speaking thirty feet or less. As the gas expands into these fractures the rock is broken. In fact, the gas pressure is what physically fragments the rock. Each blast is designed to consume the energy produced by the explosives in the breaking of the rock. However, a small amount of energy will radiate away from the blast site.

The ground movement that nearby residents and property owners feel is from the shock wave, while the venting of the expanding gas and movement of the air caused by the displaced material will create a slight air overpressure. What you "feel" inside the house is a combination of both effects. Ground vibrations travel through the earth at several thousands of feet per-second, while the effects to the atmosphere move at approximately the speed of sound. How your house will respond depends on several factors that are related to the type of blasting operation, distance to your property, and the weather.

In summary:

- Ore blasting noise and its associated seismic forces on near-by properties can be large
- Unmanaged blasting amplifies blast overpressure and seismic energy transmission outside the boundaries of the APO property, shaking homes and buildings, rattling windows and potentially damaging foundations and structures.

What are the major blasting concerns of those living nearby?

Major concerns include:

- Excessive blast overpressure and seismic forces transmitted to nearby properties may damage structures and buildings, particularly structures more susceptible to blast damage (such as swimming pools, water holding structures, etc.)
- Routine and repeated noise
- Debris from blasting becoming shrapnel
- Lack of advanced notification of blasting schedules, and upcoming and/or planned blasts
- Effects on domestic animals and livestock

Current Regulatory Schema

The Texas Railroad Commission only regulates blasting at surface coal mines. [125] [Refer to TRRC requirements for blasting noted in the footnotes]. Currently, there are no statewide regulations for APO blasting operations.

Ore blasting and use of explosives is regulated for the surface coal mining industry in Texas under the Natural Resources Code Title 4, Mines and Mining, Chapter 134.092, Texas Surface Coal Mining and Reclamation Act. This act includes, among other requirements: [126]

- advance notice (written and/or electronic) to local governments and residents who might be affected by the use of the explosives
- providing the proposed blasting schedule to each resident living within [a determined distance] of the proposed blasting site
- providing daily notice to residents in the area before blasting (blasting schedule and daily notices to be electronic)
- at the request of a resident or owner of a man-made structure within one-half mile of the permit area, conducting a pre-blasting survey and submitting the survey to the TCEQ with a copy to the resident or owner making the request
- use of explosives type and detonating equipment (using current BMP blasting technology) to minimize blast overpressure and seismic forces leaving the APO property by limiting the size, timing, and frequency of blasts according to the physical conditions of the site to prevent injury to persons, damage to public and private property outside the permit area, and prevent change in the course, channel, or availability of groundwater or surface water outside the permit area

[125] Refer to Texas Administrative Code (Last Updated: January 6, 2020), TITLE 16. ECONOMIC REGULATION PART 1. RAILROAD COMMISSION OF TEXAS, CHAPTER 12. COAL MINING REGULATIONS, SUBCHAPTER K. PERMANENT PROGRAM PERFORMANCE STANDARDS, DIVISION 2. PERMANENT PROGRAM PERFORMANCE STANDARDS, SURFACE MINING ACTIVITIES, RULE §12.357-62

[126] Natural Resources Code Title 4, Mines and Mining, Chapter 134.092, Texas Surface Coal Mining and Reclamation Act.

Best Management Practices (BMPs) for blasting are well-defined. References include the Bureau of Mines (USMB) reports, and recommendations from other research studies and current regulations in some states. For example, Kentucky's laws and regulations require that blasting on construction and quarries be limited to ground movement of 2.00 PPV and air overpressure be limited to 133 Decibels. [127]

Recommendations

Require that APOs comply with current regulations for ore blasting and use of explosives (regulated for the surface coal mining industry in Texas under the Natural Resources Code Title 4, Mines and Mining, Chapter 134.092, Texas Surface Coal Mining and Reclamation Act) [128]

Require use of established blasting BMPs, including computer-controlled blasting, or its current technology equivalent, to reduce blasting noise, blast overpressure and seismic energy transmitted to near-by properties.

Several APOs are using computer-controlled blasting technology to minimize seismic forces leaving their property and the system works well. The technology (or its equivalent) should be required in all APO mines.

[127] Adopted from Blasting Vibration, Kentucky Division of Mining Reclamation and Enforcement, Explosives and Blasting Branch

[128] Tex. Nat Res. Code Ann. § 134.092

6. Reclamation Efforts

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

An APO can cease operations for a number of possible reasons, including the following: the operating company declares bankruptcy, the mining site no longer contains a useful amount of the needed minerals, a decline in the demand for new construction, or any number of other reasons. When an operation ends, however, the land that is left behind will have been greatly changed from its original condition. [129]

While "we do not have the level of information and skill required to return ecosystems exactly to their original structure nor is the same amount of excavated material available to fill a pit and return it to the original ground contours", [130] the technology does exist to ensure that the land left behind is safe and reusable. Doing so requires that the land be free of hazardous materials and industrial equipment, that all retaining ponds (including fine tailing retention ponds) be filled in, that the walls of a pit have been sloped to avoid leaving a dangerous cliff, and that any exposed rock is secured so as to not be in danger of collapse or rockfall.

Current Regulatory Schema

Currently, APO reclamation requirements are in place only for the John Graves Scenic Riverway. The Applicable regulation is TITLE 30, ENVIRONMENTAL QUALITY, PART 1, TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, CHAPTER 311, WATERSHED PROTECTION, SUBCHAPTER H, REGULATION OF QUARRIES IN THE JOHN GRAVES SCENIC RIVERWAY, RULE §311.78, Restoration Plan. [131] Other APO operations are not subject to this set of regulations.

Recommendations

Require that APO stormwater permit applications for APO sites contain a reclamation plan to restore disturbed lands to a condition free of public hazards and safe for future use.

[129] (Langer, Drew and Sachs 2004, 47)
[130] *ibid*
[131] Source Note: The provisions of this §311.76 adopted effective August 3, 2006, 31 Tex Reg 6033

Require Operator to post a Surety Bond to cover all reclamation costs at any point during the life of the mining project in the event operator ceases operation and fails to reclaim disturbed lands.

Reclamation plans should address all potential future safety and environmental problems (fugitive dust from areas not revegetated, erosion control by revegetating baren areas, etc.) that will allow the permit area to serve useful post-operations land use.

7. Distance of Facilities from Adjoining Property Lines

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public on the question of how the distance between an APO and a residential area, church, school, or commercial area required by state or local governments impacts the lives of those living in surrounding areas. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

The Texas Clean Air Act (TCAA) [132] and related regulations identify facilities that are subject to distance limitations and buffer requirements, and what size buffers existing laws require. [133] Where distance limitations exist in the TCAA, they are imposed as a condition of a permit to construct a new facility or modify an existing facility [134] as explained in the Air Quality section of this report.

Distance limitations for APOs are found in a myriad of regulations and TCEQ rules relating to specific pieces of equipment which fall under certain air quality authorizations. However, there are no distance requirements for quarrying generally or the excavation activities at an APO.

The TCEQ sets distance limitations (setback from buildings in use as a single or multi-family residence, school, or place of worship) using 30 TAC Chapter 116. [135] Title 30 TAC 116.112 applies primarily to lead smelters and concrete crushing facilities, although additional TCEQ rules set spacing requirements for crushing facilities, concrete batch plants with enhanced controls and hot mix asphalt plants. Some of these rules are part of standard permit application requirements. No setback spacing requirements are in place for standard CBPs or rock crushers.

A person who owns or operates a facility or facilities that will emit air contaminants is required to obtain authorization from the Commission prior to the construction and operation of the facility or facilities. Permit conditions of general applicability must comply with rules adopted by the Commission. These rules do not apply to the excavation APO blasting zones, only for the equipment itself, such as rock rushers, conveyers, stockpiles, among others. Those rules are found in 30 TAC Chapter 116. [136]

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[132] Tex. Health & Safety Code, ch. 382

[133] The material provided herein presents the plain language of the law; it does not address the rationale underlying the buffer requirements or how the specific distance limitations were set.

[134] Facility" means "a discrete or identifiable structure, device, item, equipment, or enclosure that constitutes or contains a stationary source, including appurtenances other than emission control equipment. A mine, quarry, well test, or road is not considered to be a facility." Tex. Health & Safety Code § 382.003(6).

[135] TCEQ Regulation VI, Rule 116

[136] 30 TAC Chapter 116

30 TAC § 116.111(a)(2)(A)(ii) states: "For issuance of a permit for construction or modification of any facility within 3000 feet of an elementary, junior high/middle, or senior high school, the commission shall consider any possible adverse short-term or long-term side effects that an air contaminant or nuisance order from the facility may have on the individuals attending the school(s)." [137]

Section 116.112 addresses distance limitations, primarily for lead smelters and concrete crushing facilities. A concrete crushing facility must not be operated within 440 yards of any building in use as a single or multi-family residence, school, or place of worship at the time the application for the initial authorization for the operation of that facility at that location is filed with the Commission.

Current Regulatory Schema

Bulk Mineral Handling Facilities

The facility (including associated stationary equipment and stockpiles) shall be located at least 300 feet from any recreational area, school, residence, or other structure not occupied or used solely by the owner of the property upon which the facility is located. (Permit by Rule – Facility-Specific Requirement)

Concrete Batch Plants with Enhanced Controls

Concrete batch plants with enhanced controls in an area that is not subject to municipal zoning regulation are subject to several distance limitations and setbacks, including a 440-yard setback requirement ("buffer zone" between concrete batch plants and existing residences, schools, and churches) set out in Texas Clean Air Act TCAA § 382.05198(a). (In addition, TCAA § 382.065 pertains to certain locations for operating concrete crushing facilities, see relevant section below). [138] Specific requirements are:

Statutory Condition (not set by regulation):

"The following distance limitations must be met: (i) the suction shroud baghouse exhaust must be more than 100 feet from any property line; (ii) stationary equipment, stockpiles, and vehicles used at the plant, except for incidental traffic and vehicles as they enter and exit the site, must be located or operated more than 100 feet from any property line; and (iii) if the plant is located in an area that is not subject to municipal zoning regulation, the central baghouse must be located at least 440 yards from any building used as a single or multifamily residence, school, or place of worship at the time the standard permit registration is filed with the commission." "In lieu of meeting the distance requirements for roads and stockpiles, the following must be followed: (i) each road, parking lot, and other traffic area. (Standard Permit (Non-Rule) – Facility-Specific Requirement)

[137] TCEQ Regulation VI, Rule 116.111(a)(2)(A)(ii)
[138] Texas Clean Air Act TCAA § 382.05198(a) and TCAA § 382.065

Standard Concrete Batch Plant

Three types of CBPs are recognized: Permanent, Temporary, and Specialty.

Air Quality Standard Permits for Standard Concrete Batch Plants (standard CBPs) are governed under TCAA § 382.05195. [139] Distance requirements in TCAA § 382.05198 are not applicable to standard CBPs, [140] and TCEQ permits are issued for standard CBPs with no setback requirement, except for the following spacing/distance requirements:

Statutory Condition (not set by regulation):

The standard concrete batch plant shall be at least 550 feet from any crushing plant or hot mix asphalt plant. The owner or operator shall measure from the closest point on the concrete batch plant to the closest point on any other facility. If the owner or operator cannot meet this distance, then the owner or operator shall not operate the concrete batch plant at the same time as the rock crusher, concrete crusher, or hot mix asphalt plant."

For temporary concrete batch plants, "The owner or operator shall maintain the following minimum plant buffer distances from any property line, except for temporary concrete plants approved to operate in the right of way of a public works project: (i) The suction shroud baghouse exhaust shall be at least 100 feet from any property line. (ii) The owner or operator shall not locate or operate stationary equipment, stockpiles, or vehicles used for the operation of the concrete batch plant (except for incidental traffic and the entrance and exit to the site) within 50 feet from any property line." In lieu of meeting the buffer requirement, the owner can construct dust suppressing fencing and contain stockpiles within a bunker that meets certain design requirements.

The same general requirements apply for permanent concrete plants. For specialty concrete batch plants, "[t]he owner or operator shall not operate vehicles used for the operation of the concrete batch plant (except for incidental traffic and the entrance and exit to the site) within a minimum buffer distance of 25 feet from any property line." In lieu of meeting the buffer requirement an owner can construct dust suppressing fencing. (Standard Permit (Non-Rule) – Facility-Specific Requirement)

Permanent Rock and Concrete Crushers

Crushers authorized by the standard permit shall be located a minimum of 200 feet from the property line and at least 550 feet from any other rock crushing plant, concrete batch plant or hot mix asphalt plant and 440 yards from any building which was in use as a single or multi-family residence, school, or place of worship.

With certain exceptions, "a concrete crushing facility shall be operated at least 440 yards from any building which was in use as a single or multi-family residence, school, or place of worship at the time an application was filed. The measurement of distance shall be taken from the point on the concrete crushing facility that is nearest to the residence, school, or place of worship toward the

[139] TCAA § 382.05195
[140] TCAA § 382.05198

point on the building in use as a residence, school, or place of worship that is nearest the concrete crushing facility." This requirement does not apply to "a concrete crushing facility at a location for which the distance requirements . . . were satisfied at the time an application was filed with the commission, provided that the authorization was granted and maintained, regardless of whether a single or multi-family residence, school, or place of worship is subsequently built or put to use within 440 yards of the facility. (Standard Permit (Non-Rule) – Facility-Specific Requirement)

Statutory Condition (not set by regulation):

In addition, TCAA § 382.065 pertains to certain locations for operating concrete crushing facilities. [141] With certain exceptions, TCEQ is prohibited from issuing a permit for a concrete crushing facility "within 440 yards of a building in use as a single or multifamily residence, school, or place of worship at the time the application for a permit to operate the facility at a site near the residence, school, or place of worship is filed with the commission."

Sand and Gravel Processing

This section applies to any "sand and gravel production facility that obtains its mineral from deposits of sand and gravel consisting of natural disintegration of rock and stone. A sand and gravel processing facility is permitted by rule so long as, among other things, "the plant is located at least 1/4 mile (440 yards) from any recreational area or residence or other structure not occupied or used solely by the owner of the facility or the owner of the property upon which the facility is located. (Permit by Rule – Facility-Specific Requirement)

Hot Mix Asphalt Plants (HMAP)

General requirement for Asphalt Silos: A silo must be "located at least 300 feet from any recreational area, school, residence, or other structure not occupied or used solely by the owner of the property upon which the silo(s) is located.". (Permit by Rule – Facility-Specific Requirement). More specific rules apply to HMAPs, as outlined next.

TCEQ rules for a standard permit application specify that a hot mix asphalt plant, and all its associated facilities, shall be located a minimum distance to the property line. This minimum property line distance is determined by utilizing the following table. If no site-specific data is available, a 0.5 volatility factor (0.5) shall be used. In all cases, the holder of this standard permit shall determine the appropriate distance by rounding up to the highest distance that is provided in the table by production and volatility factor. There shall be no interpolation in determining the appropriate property line distance.[142] Only one of the nine distances provided in this table shall be used. For example, a plant producing 250 tph of asphalt mix and using a volatility factor of .35 shall use the distance of 300 ft. For a 300 tph plant using a volatility factor of, 0.42 this distance would be 425 feet.

[141] TCAA § 382.05198(a) and TCAA §382.065

[142] In laymen's terms, TCEQ staff are not able to determine the setback distance themselves, they may only apply the predetermined formulas.

Actual Production	Volatility factor of no more than 0.30	Volatility factor of no more than 0.42	Volatility factor of no more than 0.50
no more than 400 tph	450 ft	550 ft	650 ft
no more than 300 tph	300 ft	425 ft	500 ft
no more than 200 tph	200 ft	275 ft	375 ft

New Source Review Permit

New Source Review (NSR) Permits are required for the construction or modification of any facility that does not meet the requirements for a de minimis authorization, permit by rule, or standard permit. Unlike standard permits which apply to a general class of similar facilities, NSR permits are case-specific.

Statutory Condition (not set *by* regulation):

There is one general distance limitation that applies to all NSR permits: "In considering the issuance of a permit to construct or modify a facility within 3,000 feet of an elementary, junior high, or senior high school, the commission shall consider possible adverse short-term or long-term side effects of air contaminants or nuisance odors from the facility on the individuals attending the school facilities."[143]

Recommendations:

Revise requirements for standard permits for APO equipment to define setbacks by the distance from the property line of the APO rather than the specific piece of equipment.

Revise Permit by Rule and Standard Permit applications to require compliance with all requirements of the New Source Review Permit requirements

Revise Texas Administrative Code Chapter 65 to remove exemption for standard concrete batch plants (CBPs) from spacing stand-off requirements by revising and approving 2019 SB 208 to specifically state that all CBPs [144] will be held to a setback of 880 yards.

Revise setback rules for all APOs to treat platted subdivisions as residential areas.

[143] (Texas Commission on Environmental Quality 2020)
[144] Tex. S.B. 208, 86th Leg., R.S. (2019)

8. Disruption of Groundwater

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

Future Water Supply in the 16 Texas Water Development Board (TWDB) Regions in the state are short to meet future water demand. Even more concerning is that these shortages are growing with each 5 -year update of the Plan. Per the 2017 State Water Plan, the shortfall grows from 17% in 2020 to 37% in 2070, with groundwater supplies dropping throughout the period (24% drop from 2020 to 2070).

The TWDB's 2017 State Water Plan includes mining water demand consisting of water used in the exploration, development, and extraction of oil, gas, coal, aggregates, and other materials. Mining water demand is projected to decline slightly from 2020 to 2070 while remaining between 1 and 2 percent of total water use in all decades. Few of the APOs responded to the TWDB's surveys used to prepare the most recent State Water Plan, Because of this, the rapid growth of the industry and inclusion of results with other industries such as oil and gas, it is believed that this forecast does not completely account for the current and expected growth of the APOs. Projecting APO water needs using USGS data on 2015-16 APO production and population growth projections from the TWDB's Plan, the outlook for mining changes significantly- APO use grows 73%, resulting in the overall mining forecast to remain essentially flat at about 400,000 ac-ft/year.

APOs require significant volumes of water to produce their products. APO quarry mines require about 50 gal/ton of aggregate processed. Water is required for dust control on quarry roads and at product crushing/sizing/storage sites. Although sand mining operations may have access to surface water for these purposes, virtually all crushed stone and dimension stone operations utilize ground water for operational dust control. Some may use water delivered via a pipeline. Many APOs utilize a variety of water conservation and reuse as operational best practices; others do not.

Current Regulatory Schema

Depending on their age and county of operation, APO ground water supply wells may or may not be currently regulated by Ground Water Conservation Districts (GCDs). Also, several APOs operate in counties which do not have GCDs (e.g., Williamson and Travis Counties). Thus, current and historic APO water use data is not readily available to the public.

The proliferation of new APOs along the length of the Edwards Limestone outcrop and recharge

zones leads to a situation where new domestic developments will be competing with APOs for limited ground water resources. Where locally required[145], real estate developers must comply with the Groundwater Availability Rules specified in Chapter 230 of the Texas Administrative Code. [146] APOs must comply with GCD requirements, which may be more or less comprehensive than Chapter 230 rules. This could lead to inconsistent regulatory requirements and enforcement. It could also limit the GCDs' ability to adequately assess the cumulative regional impacts of future real estate and APO developments on the State's limited ground water resources. Because the locations of many APOs are temporary and not all surveyed entities responded to TWDB surveys, the extent of these cumulative impacts is difficult to quantify.

The TWDB contracted a study, Current and Projected Water Use in the Texas Mining and Oil and Gas Industry (BEG, 2011), to improve estimates of water use. In that report, the Bureau of Economic Geology (BEG) estimated recent (2008) mining water use and projected the use across the planning horizon (2010- 2060). The study projections used data collected from trade organizations, government agencies, and other industry representatives, and in some cases water use coefficients were utilized to extrapolate water use for counties with no known water use data.

In 2012, the TWDB conducted a separate, additional survey of APOs to assess current APO water use to compare to the BEG, 2011 results. In that survey effort, APOs that responded were generally non-transitory in nature and the operations with substantial water use continue to be surveyed annually. Because of an apparent increase in mining facilities across the state, in 2019 the TWDB obtained an updated list of permitted APO facilities from TCEQ and added approximately 900 additional mining entities to its survey distribution. The TWDB' s annual survey period is currently ongoing through March 1, 2020.

Recommendations

An in-depth assessment of APO water use should be completed by the Texas Water Development Board. This assessment should be done regionally to account for the varying APOs such as aggregate quarries and CBPs, include technically and operationally based assessments of water use, and be clearly delineated in the TWDB's Water Plans.

Study future water supply, especially for the rapidly growing areas of our state such as the Hill Country where water supplies are limited, and the Houston area where sedimentation is threatening the Lake Houston water supply for most of the highly populated region.
Ask: Where is the water coming from? And is it protected? Utilize the PGMA process described below.

Require that any APO operation utilizing groundwater outside the jurisdiction of a GCD use a TCEQ approved method of water recirculation to ensure an efficient use of groundwater resources.

[145] This is a permissive authority exercised by municipal or county platting authorities and should be couched as such. Tex. Loc. Gov't Code § 212.0101 & 232.0032.
[146] 30 Tex. Admin Code § 230 (2003)

9. Water Quality

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

Mining disturbs pre-existing landscapes until the area's topography is re-established and revegetated. Water coming into contact with lands disturbed by APOs must be captured and treated before being discharged to natural watercourses. The current APO regulation of surface water control facilities via Stormwater Pollution Prevention Plans (SWP3s) enforced by TCEQ is less rigorous than surface water control requirements required for coal and lignite mines by the Surface Mining Control and Reclamation Act of 1979 [147] enforced by the Texas Railroad Commission.

APOs are allowed to construct water control ponds and other facilities based on their preferred 'best management practice', often without rigorous engineering or regulatory inspection of those facilities. The Committee received anecdotal evidence from neighbors whose properties had been impacted by sediment-laden discharge from failed APO water control facilities. Similar issues were highlighted regarding Sedimentation and Flooding, as described in the following section. Per TCEQ, nearly half (42%) of APO non-registration related enforcement actions were due to noncompliance with water program rules and regulations.

From APO Program initiation on September 1, 2012 to present, APO registration-related violations accounted for approximately 32% of violations documented at APO sites. Of the other non-registration type violations at APO sites, 42% were violations for noncompliance with regulations under Water program rules and regulations, 17% for noncompliance with rules and regulations under Air programs, and 9% for noncompliance with rules and regulations under Waste programs.

In the TCEQ water programs, the majority of non-registration type violations at APO sites are related to noncompliance with stormwater permit requirements (water quality). There is also a significant number of violations documented at APO sites for unauthorized wastewater discharges and noncompliance with Public Drinking Water regulations.

The TCEQ analyzed inspections/investigations conducted by TCEQ regional field investigators at sites identified to be APOs. This data does not include investigations and violations that were self-reported by regulated entities (either under a self-audit, or as part of a reporting requirement).

[147] 30 U.S.C. ch. 25 § 1201 et seq.

Ground water pollution by APOs is a legitimate concern. Due to the karst geology of the Edwards Limestone and Edwards Aquifer Recharge Zone (EARZ), if a pollutant enters an Edwards formation aquifer, the impact on nearby water supplies can occur in a matter of days. The Committee heard testimony regarding diesel spills into the Edwards which traveled several miles in less than a week. The TCEQ requires APOs to file Water Pollution Abatement Plans for operations that could impact such aquifers, but these plans are based on pre-mining geologic feature surveys, and follow-up is sporadic. Subsequent blasting by APOs increases the probability of ground water pollution via karst features in the immediate vicinity of the quarries.

Current Regulatory Schema

TCEQ Administers: [148] [149] [150]

- Texas Stormwater Pollution Protection Plans
- Texas Pollutant Discharge Eliminations System
- Water Pollution Abatement Plans (Edwards Aquifer Recharge Zone)

Texas Railroad Commission (TRC) Administers:

- Surface Coal Mining and Reclamation Act of 1979 (SMCRA)
- Rules of the Surface Mining and Reclamation Division under Title 16, Part 1, Chapter 12 of the Texas Administrative Code [151]

Recommendations

Require that Texas APOs comply with the Hydrologic Balance provisions currently required for coal and uranium mines by the Texas Railroad Commission at Title 16, Part 1, Chapter 12, Rule 12.146 of the Texas Administrative Code. [152]

Surface Water Quality

The existing regulatory framework includes rules and regulatory processes to protect surface water quality in areas potentially impacted by APOs. However, based on testimony received by the Committee, these programs need to be improved to a higher level of protection from pollution.

- SWP3s for APOs should be modified to include, at a minimum, all regulatory requirements regarding surface water control for Coal and Lignite mines, per TRC rules. Particular attention needs to be given to APO water impoundment design and construction.
- SWP3 and TPDES inspections and enforcement by TCEQ should also follow the standards set by TRC for Coal and Lignite Mines.

[148] 40 CFR §122.26(b)(14)(i) - (xi).
[149] (Texas Commission on Environmental Quality 2018)
[150] (Texas Commission on Environmental Quality 2020)
[151] 16 Tex. Admin. Code § 12.1
[152] 16 Tex. Admin. Code § 12.146

Ground Water Quality

The current WPAP program is not sufficient to protect the EARZ from future ground water pollution incidents. This program needs to be updated and expanded to be more robust, with a larger number of ongoing inspections. The program needs to continually monitor for new karst features at or near active mining areas.[153]

As part of the APO permitting process, dye-trace studies are needed determine the ground water flow-paths prior to major quarries being approved, especially in areas close to major natural springs and water wells.

[153] Per TCEQ: this would necessitate additional FTE resources and funding.

10. Sedimentation and Flooding

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

During the previous two decades, demand for sand and gravel to support petroleum and other industries has increased significantly in Texas. In particular, demand for sand suitable for use in fracking operations has increased exponentially. As a result, numerous sand and gravel mining operations have begun operations across many of the State's largest river systems. TCEQ provided the Committee with data showing the rapidly increasing number of sand mines which have sought and obtained TCEQ operating permits. This makes it all the more important to study and regulate these such mines in flood-prone areas so as not to aggravate problems of flooding, erosion, and sedimentation.

For example, sand mining along the San Jacinto River is one of the contributors of excess sedimentation that aggravated flooding issues in Montgomery and Harris Counties during and after Hurricane Harvey. All but one sand mine are located partially or completely within the regulatory floodway, an area delineated by FEMA as having the highest potential for flooding (and erosion) along major waterways. Communities must regulate development (including sand mines and quarries) in these floodways to ensure there is no increase in upstream flood elevations.[154] The result of partitioning large areas of the floodway from rising floodwaters by levees and dikes can result in increased flooding of adjacent areas. Flood-induced breaches in levees can also add to the problems of flooding and sedimentation downstream.

Since the passage of Section 404 of the Clean Water Act Amendments of 1977, [155] some states have heavily restricted or banned in-stream mining, as have many countries. These restrictions are mainly based on the significant environmental problems associated with this type of mining. [156]

[154] (FEMA n.d.)
[155] (United States Environmental Protection Act n.d.)
[156] (Ladson and Judd 2014), (Koehnken, et al. 2020)

Current Regulatory Schema

State-wide Rules

There are relatively few statewide regulations controlling APO's in Texas. The main regulations are described below.

The registration and inspection of APO's is the responsibility of the TCEQ under HC 571 *(Texas Water Code, 2011)*, and has significantly reduced the level of unauthorized mining. It also requires, among other things, that all active sites be inspected once every two years for the first six years, and then every three years thereafter." [157]

The regulation of discharges from quarry operations is the responsibility of the TCEQ under the National Pollutant Discharge Elimination System (NPDES) program. The main regulations *(TPDES General Permit No. TXR050000*) are related to Stormwater Pollution Prevention Plan (SWP3) requirements, [158] e.g.

- Require the use of structural and/or non-structural controls to reduce soil erosion and sedimentation in areas of the facility with demonstrated or potential soil erosion and sedimentation.
- Require annual site evaluation and an overall assessment of the effectiveness of the current SWP3.
- Monitor, sample, examine, and inspect stormwater discharges within 72 hrs. of any breach resulting in unauthorized discharges; discharges must be reported to TCEQ within 24 hrs. if may endanger human health or safety, or the environment.

Unfortunately, breaches and unauthorized discharges are sometimes left unreported and unrepaired unless citizens file reports to the TCEQ. Even when violations have been documented by the TCEQ, fines have been minimal, averaging ~$800/violation from 2013-2017 (from TCEQ report to Texas legislature, in: Rehak, 2018). [159]

Mining of marl, sand, and gravel from navigable rivers in Texas is regulated by the Texas Parks and Wildlife Department (Texas Administrative Code, 2019), where in order to acquire a permit, applicants are required to, among other things[160], provide a sedimentation impact assessment including an evaluation of sediment budget, erosion rates of the river segment to be affected, and the effect on coastal and receiving waters, approved by the department". [161]

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[157] TCEQ under HC 571 (Texas Water Code, 2011

[158] Clean Water Act §402 & Tex. Water Code § 26

[159] (Rehak 2018) appears to calculate the dollars per "fine" by dividing the total amount of assessed penalties from FY2013-2017 and then dividing it by the number of Notices of Violation ($506,151/619 = ~$817). In the TCEQ table, the 619 is the Notices of Violation and may not be the exact number of violations. The orders included in the table with the administrative penalties assessed were developed in accordance with the Commission's Penalty Policy and corporates the required factors per the Texas Water Code.

[160] 31 Tex. Admin. Code, §69.105 (2019)

[161] *ibid*

However, in-river mining has continued along the West Fork of the San Jacinto River even though no permits have been granted by TPWD, and enforcement appears to be lax.[162] Thus, it is likely these regulations described above will have little or no effect.

Area-Specific Rules

1. There is, however, a major piece of state legislation enacted by Senate Bill 1354 during the 79th Texas Legislature (established by Water Code, Chapter 26, Subchapter M), which created the John Graves Scenic Riverway. [163] This law established a pilot program to enhance water quality protection by establishing specific regulations for quarries within the watershed. This program could serve as a template for statewide regulations. The specific requirements of the legislation (TCEQ, 2008) are as follows:
   - Quarries located in a designated water quality protection area more than one mile from a water body must obtain a general permit.
   - Quarries within one mile of a water body, or within the 100-year floodplain of a water body, must obtain an individual permit.
   - New quarry operations or the expansion of existing operations between 200 feet and 1,500 feet of a water body are prohibited, unless an applicant for an individual permit can demonstrate, and the TCEQ can substantiate, that certain specific requirements are satisfied. These include specific performance criteria established by the TCEQ; plans for control of erosion and protection of fish and wildlife habitat and public and private property; plans for reclamation of a quarry; and the use of best available technology.
   - Unless otherwise exempted by the legislation, new quarry operations or the expansion of existing operations are prohibited within 200 feet of a water body within a water quality protection area designated by the TCEQ.
   - Any permit issued under SB 1354, … shall satisfy effluent limits established by the TCEQ, meet requirements for financial assurance, and include a plan for restoration of receiving waters in the event of an unauthorized discharge."

2. As part of the Flood Control Insurance Act, *Texas Water Code, Section 16.315* delegated responsibility to local governmental units (typically counties), allowing them to adopt regulations designed to minimize flood losses. [164] Given that all the mines in the San Jacinto River Watershed are located either partially or entirely in the *regulated floodway*, industry-wide compliance with locally developed rules could result in significantly reduced flooding, and flood-related erosion/sedimentation. For example, the following is an excerpt from the Montgomery County Flood Plain Management Regulations (2014). [165]

   Section E. Floodways: *"Located within special flood hazard areas established in Article III, Section B, are areas designated as floodways. Since the floodway is an extremely*

[162] (see discussion in Rehak, 2020)
[163] Tex. Water Code § 26(m)
[164] Tex. Water Code § 16.315
[165] Montgomery County, Tex., Flood Plain Management Regulations (2014).

hazardous area due to the velocity of flood waters which carry debris, potential projectiles and erosion potential, the following provisions shall apply:

(1) Encroachments are prohibited, including but not limited to fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge. A development permit must be secured from the Flood Plain Administrator prior to the placement of fill or other encroachment in the floodway."

Recommendations

Best Management Practices (BMP's) for APO's, similar to those in many other states (e.g. Louisiana Department of Environmental Quality, 2007) [166] are needed.

Reliance on voluntary use of BMP's alone as a control measure will likely be ineffective, hence the need for legislative action. Any new legislation enacted to address the myriad issues regarding APOs needs to include provisions which apply specifically to *quarry operations occurring on or near specified riverways and their associated floodplains* because these operations differ significantly from APOs located along the Balcones Escarpment. Segments of riverways included under the new rules should be clearly listed in the legislation. Regulatory provisions similar to those listed above for the John Graves Scenic Riverway should be included in any new APO legislation related to quarries along specified riverways and their associated floodplains. Specific recommendations include:

New mining should be minimized or restricted in delineated floodplains, floodways (areas of most frequent flooding) and channel migration zones (areas most like to be eroded by lateral migration and river avulsion).

Mines should be "prohibited within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed encroachment would not result in any increase in flood levels.
A development permit must be secured from the Flood Plain Administrator prior to the placement of fill or other encroachment in the floodway…." (Montgomery County Flood Plain Management Regulations, 2014).

Stockpiles should be located outside the floodway, because of the high potential for erosion (and resultant sediment pollution) during frequent flooding.

Erosion control requirements should be implemented during construction, active mining, and post-mining phases to minimize damage to stream banks and riparian vegetation. Sand/gravel extraction in vegetated riparian areas should be avoided.

[166] (Louisiana Department of Environmental Quality 2000)

Undercut and incised vegetated banks should not be altered. Large woody debris in the riparian zone should be left undisturbed or replaced when moved and not be burnt. Only clear and grub acreage as needed for the immediate term.

A natural [vegetated] riparian buffer should be maintained along the margins of streams to both resist erosion and shade and cool the river.

A minimum buffer zone width should be maintained between pits and perennial and ephemeral streams, adjacent landowner's properties, and public water supply and domestic water wells.

Minimum widths and slopes for protective levees should be required to avoid breaches allowing water to enter or exit the pits.
If located in the 100-yr. (1%) floodplain, levees should be designed to withstand flooding and erosion from a 100-yr. (1%) flood. Levees should not restrict the stream flow during a major flood as that can cause increased flooding downstream.

Mining below the depth of the adjacent channel bottom (thalweg) should be restricted or prohibited in order to minimize potential for pit capture.

Appropriate state agencies should regularly conduct water-quality sampling (e.g. sediment/turbidity, hydrocarbons, chlorides, sulfates, TDS (total dissolved solids), pH, DO [dissolved oxygen], cyanobacteria, and other likely contaminants) both from surface sampling and aerial surveillance during the active mining phase and at regular intervals after mine abandonment.

11. Municipal Ordinances

Committee Action

The committee received written testimony from the Texas Commission on Environmental Quality (TCEQ), the Mine Safety and Health Administration (MSHA), the Texas Aggregate and Concrete Association (TACA), Texans for Responsible Aggregate Mining (TRAM), and members of the public. The committee also consulted published articles from scientific journals as well as publications from the United States Geological Survey (USGS) and American Geologic Institute.

Background

While not all states have "county zoning" per se, all other states have some mechanism to ensure that zoning, long-range planning controls are available to all jurisdiction types within their boundaries.

Population growth has already put immense stress on Hill Country counties. County roads are being inundated past capacity with cars from new subdivision tracts. No one has the authority to prevent a rock quarry or industrial facility from going in behind existing homes, reducing property values. The water supply is being threatened as increased impervious cover directs oily, contaminated runoff toward our groundwater.

Unlike counties in the rest of the country, counties in Texas generally do not have the authority to protect land values. Others do this by ensuring new development does not deplete or pollute the water supply, collecting impact fees from developers to cover the cost of infrastructure, designating impervious cover or density guidelines, protecting night skies or preserving scenic beauty by regulating billboards or cell towers. [167]

With a few notable exceptions, efforts to expand county land use powers in Texas have failed to advance since the most recent major revisions to the county provisions in the Texas Local Government Code passed in 2001. Despite the stalling of recent legislative efforts, many county officials continue to express their concerns about the effects of their limited ability to prevent some of the more negative effects of development and state the need for these limitations to be addressed through legislative action. The paper referenced below outlines the current state of county land use in Texas, focusing on the powers that counties currently have at their disposal. For each of these powers, where applicable, instances of counties innovating to maximize their granted powers in order to more effectively control land use are highlighted. [168]

[167] (Hill Country Alliance 2020)
[168] (Capitol Area Council of Governments 2009)

Current Regulatory Schema

City vs County Authority

Texas cities have comparatively strong powers in comparison with cities in most other states. Cities in Texas have the right to impose impact fees, which is far from uniform across the country. Similarly, Texas cities can review development outside of its city limits in areas called extra-territorial jurisdictions. This practice does not exist in the vast majority of states. Resultantly, city planning operations in Texas are frequently quite sophisticated, engaging in practices not allowable in many other states.

County Authority

Counties are given the right to review and regulate the subdivision of land. [169] Section 232 of the Texas Local Government Code details counties' subdivision authority. [170] The basis of this grant of powers is the requirement for counties to review plats except under certain conditions under which subdivisions are exempt from plat review. The types of subdivisions that are exempt are those that create a "daughter tract" for relatives within the third degree of the subdivider, lots over10 acres, lots with frontage on existing roads, those created for veterans under certain conditions and lands that are subdivided for agricultural uses.

Sections 232.003 [171] and 232.0032 [172] grant counties the ability to set and enforce specifications for the supply of water, the treatment of wastewater and the handling of stormwater runoff. Section 366 of the Health and Safety Code allows counties to regulate the design, location and construction of on-site sewage disposal systems. Section 232.0032 specifically grants counties the ability to require an engineer's certification that wells, or other subsurface sources of drinking water are adequate to serve the subdivision.

Counties with populations in excess of 1.4 million have the ability to regulate water wells in order to avoid some of the more negative possible sources of groundwater contamination. This ability is detailed in Section 240.042 of the Local Government Code. [173] Especially important in this power is the ability to regulate wells in a manner so that on-site sewage treatment systems do not contaminate water sources.

Buffer Requirements

The City of Houston and other cities have the right to impose Public Health & Safety requirements whereas many Counties lack this authority.

The City of Houston controls the siting of harmful uses by adopting buffer requirements. There are numerous examples of buffers or distance limitations in the Houston Municipal Code. Local

[169] (Capitol Area Council of Governments 2009)
[170] Tex. Loc. Gov't Code § 232
[171] Tex. Loc. Gov't Code § 232.003
[172] Tex. Loc. Gov't Code § 232.0032
[173] Tex. Loc. Gov't Code § 240.042

buffer requirements apply to oil and gas wells, [174] metal and automotive parts recycling lots, [175] slaughterhouses, [176] alcohol establishments, [177] sexually oriented businesses, [178] and hotels. [179] In each of these examples, the ordinance works by making the regulated use "unlawful" unless the buffer requirement is satisfied, thereby invoking the general penalty provision as an enforcement mechanism." [180]

Nuisance Abatement

"Nuisance abatement is another common strategy that local governments use to minimize environmental harms. The TCAA's savings clause expressly authorizes a municipality to enact an ordinance mandating the abatement of air pollution that causes a nuisance. [181] Municipalities also have general authority under Texas law to define and punish conduct that constitutes a nuisance. [182] Pursuant to these statutory grants of authority, Houston has adopted an ordinance that makes it "unlawful" for an owner or occupant of land to maintain a public nuisance on his or her property. [183] Public nuisances include "the escape of any gases, dusts, fumes, mists, and sprays to such an extent that the same, or any one of them, shall become, or be likely to become, hazardous to health or a source of discomfort to persons living or passing in the vicinity." [184]

Other specific authorities granted to Counties under state law are enumerated in the Municipal Ordinances Reference by Michael Spano, 10/24/20, under the section entitled 2018 GUIDE TO TEXAS LAWS FOR COUNTY OFFICIALS. [185]

Planning Commissions

Under Chapter 232, Subchapter B (Sections 232.021-232.043) of the Local Government Code, [186] counties with territories within 50 miles of the Mexican Border may establish a planning commission, something that is not explicitly granted to other counties in the Code. This subchapter also requires the counties to enact the TWDB model ordinance described above.

[174] Hous., Tex., Code of Ordinances § 31-57
[175] Hous., Tex., Code of Ordinances § 7-51, 8-16, 28-34.
[176] Hous., Tex., Code of Ordinances § 10-272
[177] Hous., Tex., Code of Ordinances § 3-2
[178] Hous., Tex., Code of Ordinances § 28-125
[179] Hous., Tex., Code of Ordinances § 28-202.
[180] Hous., Tex., Code of Ordinances §§ 31-5, 31-23
[181] Tex. Health & Safety Code § 382.113.
[182] Tex. Loc. Gov't Code § 217.042.
[183] Hous., Tex., Code of Ordinances § 10-451(c)-(d).
[184] Hous., Tex., Code of Ordinances § 10-451(b)(1).
[185] (Brooks 2018)
[186] Tex. Loc Gov't Code §232.021-232.043

Recommendations

Density rules: Where water resources are limited and fragile, counties must have the ability to establish density limits and averages. This would allow developers the flexibility to condense development or use a large lot plan depending on what is more feasible and appropriate.

Setbacks between incompatible land uses: To protect property values, counties would be able to provide some distance between existing neighborhoods or ranches and newly proposed industrial uses.

Grant authority to smaller counties consistent with authority given to counties with populations in excess of 1.4 million to regulate water wells in order to avoid some of the more negative possible sources of groundwater contamination.

12. Economic Impact

Background & Committee Action

During the 86th legislative session, the issue of potential economic consequences arising from proposed legislation was repeatedly mentioned by members of the APO Industry. Industries also expressed concern that a permit process would hinder those who already follow responsible practices above and beyond current regulations, both in legal costs and in delaying new facilities coming online.

In their written testimony to the committee (Appendix A), TACA stated that, *"Pushing facilities farther away from where the products are needed will add a tremendous amount of cost to these materials, which are critical not only for private development, but also for all types of infrastructure and construction, including the roads and highways system managed by TXDOT."*

In order to properly investigate these claims, the committee submitted several rounds of requests for information (RFIs) to industry groups and members of industry, including the National Sand, Stone, and Gravel Association, the National Ready-Mix Concrete Association, the Arizona Rock Product Organization, and TACA, hoping to receive information about how regulations on APOs in other states affected the price of concrete and their overall economies, or any data that would substantiate TACA's concerns.

Other than TACA, all requests were either refused or not responded to. TACA's testimony[187], as seen in Appendix A, consisted of 8 double spaced pages of text, two pages of appendices listing the permits required for operating an APO[188], provided no additional background or information as to the potential economic impact of previously proposed legislation, cited no sources, and contained no substantive data.

It was brought to the attention of the committee on December 18, 2020, that members of the industry felt that not enough debate or vetting had taken place for the recommendations contained in this report, claiming that the COIVD-19 restrictions preventing in-person meetings of committees prevented the proper debate necessary for vetting potential committee recommendations.

While these restrictions did prevent in-person meetings, the repeated efforts by the committee to reach out to members of the APO industry by phone, email, and in-person, followed by the lack of response, either by refusal or failure to send any response whatsoever, indicated to the committee a lack of willingness by the industry to engage in that vetting process.

Following the December 18, 2020 communication, the committee offered members of industry another opportunity to provide input and data, which would be considered and potentially

[187] Which was not received until after the 5:00pm 10/30/20 deadline for public testimony.
[188] Listed by type of APO, with the majority of the listed permits being repeated three times, once for each type of APO.

incorporated into the final version of the report. Again, as with all previous attempts throughout 2020, members of industry failed to provide any additional data or input, choosing instead to simply restate their claim that insufficient debate had taken place.

The committee has taken its responsibility to uphold a fair and unbiased process seriously and has given every opportunity for members of the APO industry to provide data and feedback regarding the potential economic consequences of previously proposed legislation and the recommendations proposed in this report.

Recommendations:

Should concerns about the potential economic consequences of direct regulations on the APO industry become substantiated by reputable data, the legislature should institute a Best Practices Compliance Incentive Program, requiring that a contractor looking to do business with the State of Texas or a Political Subdivision, demonstrate that all APOs with whom they are doing business have received from TCEQ a certification of compliance with a set of industry best practices.

Given the concerns of the industry on direct regulation, the committee found that, should the economic consequences of direct regulation be so dire as to merit taking none of the actions otherwise recommended in this report, the State of Texas should tackle the issue through the use of its buying power as a major customer of the APO industry, rather than its role as regulator. This would be accomplished through the use of a Best Practices Compliance Incentive Program (BCPIP).

A BCPIP would involve the creation of a board made up of industry principles, industry professionals, legislators, and members of the public to establish a set of Best Practices for APOs. APOs would then be able to apply to undergo inspection by TCEQ for compliance with the established Best Practices and become certified as a Best Practices Operator (BPO). Certification would not be required in order to operate an APO, only to distinguish an APO as a BPO.

Similar to TXDoT's certification program establishing the quality of rock produced by an APO, when a contractor or construction firm submits a bid to a state agency (ex. TXDoT), they would be required to submit the list of APOs with whom they contract to supply raw materials for any and all projects currently in progress or negotiation. If the list of suppliers contains any names of APOs not certified as BPOs, the bid will be returned for amendment until a new supplier is found or the APO in question obtains BPO status.

This process would allow for those in the APO industry who are following Best Practices to distinguish themselves, and prevents tax dollars from going to operators who do not take the safety and well-being of their surrounding community seriously, all without placing any one-size-fits all requirements on APOs who would do not wish to operate within the bounds of Best Practices.

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Appendix A

Texas Aggregates & Concrete Association

House Committee on Aggregate Production Operations, Interim Study
Clerk: Jeff Frazier Room: EXT E2.714

Invited Testimony from the Texas Aggregates & Concrete Association
Josh Leftwich, President

Texas is growing at an unprecedented rate. Its population grows by about 1,000 persons per day. That means there is great demand for the raw materials which are used to provide homes, infrastructure and structures for these new residents and businesses. Currently, to support new and existing infrastructure, Texas consumes per capita approximately 2 yards of concrete, 10 tons of aggregate and about 0.6 tons of cement.

The Texas Aggregates & Concrete Association (TACA) represents members who are the main resource for these necessary construction materials, representing 75% of the ready-mix, 80% of the aggregates and 100% of the cement producers in the state.

TACA industries are a major economic force in Texas:
The Texas Aggregates & Concrete Association is the leading state trade association for the aggregate, concrete, and cement production industries. The association represents a growing industry with more than $9 billion annually in direct economic impact. We literally build Texas. We produce the most stone, sand and gravel, ready mixed concrete and Portland cement of any other state in the United States. We are a local business. We are the hard workers who are raising families in the communities where we operate.

TACA members support job creation. We provide much-needed economic stimulus to local communities. More than 100,000 Texans are employed by the state's aggregate, concrete and cement industries, along with the supporting companies that supply equipment and services to these producers.

Texas' thriving and diverse commercial base also relies on TACA member companies. With an emphasis on capital-intensive industries aggregates, concrete and other related materials are used to provide the building blocks for start-up, ongoing operation and expansion projects, all of which further support the state's economic growth.

The industry enhances Texans' quality of life:

By sheer volume, no other raw materials play such an outsized role in our daily lives. Concrete and aggregates provide the basic raw materials essential to the construction of vital transportation routes, homes, hospitals and schools, as well as countless other projects, both public and private. They are integral to the overall prosperity of Texas.

Texans rely on concrete. For example:

- a residential home on average requires 100 yards;
- a mile of six-lane highway 15,000 yards; and
- a hospital 30,000 yards.

Safely and reliably, TACA member companies make this growth possible. By relying on resources within Texas and sourced locally, the cost of infrastructure development is reduced, and the availability of critical construction materials is ensured.

The industry is highly regulated:

More than 15 regulatory agencies oversee different aspects (Appendix A) of the aggregate, concrete, cement and other associated industries in Texas. Adding regulatory burdens by creating new programs with a different agency only serves to diminish the effectiveness of the already robust array of requirements in place through subjective requirements, confusing overlap, and additional government bureaucracy.

The TCEQ is the primary environmental regulatory agency that oversees the compliance of these facilities. It employs more than 2,500 professional staff, many of whom are strategically located in 16 different regions of Texas. TCEQ regulates Aggregate Production Operations (APOs). The TCEQ Air Permits Division issued NSR and Standard air permits to rock crushers located at APOs . The emission limits in the air quality permits are conservatively established in order to be protective of human health and the environment.

During the permit application process, the TCEQ Air Permits Division reviews the operational parameters of the facility (e.g., number of crushers, operating rates, and location to property lines) in order to

compare the crusher's predicted emission concentrations to appropriate state and federal air quality standards.

The specific, health-based modeling and impacts standards employed in evaluating the potential emissions include the National Ambient Air Quality Standards (NAAQS) and TCEQ standards contained in Title 30 of the Texas Administrative Code (30 TAC).

The TCEQ's technical staff conducts an "Air Quality Analysis." The TCEQ Executive Director's staff, often professional engineers with P.E. certifications and toxicologists with Masters level educations, review emissions rates and assess the potential for adverse short- or long-term health effects for the general public. Their reviews are inclusive of sensitive subgroups such as children, the elderly or those individuals with preexisting health conditions, animal life, crops and vegetation. Their review also assesses the potential for adverse health effects for persons living adjacent to the facility or visiting nearby properties. Furthermore – the following key points are critical to emphasize:

- There are no known adverse health effects associated with APOs operating in proximity to neighborhoods, schools or commercial developments. Common health concerns expressed about crushing operations relate to visible particulate matter (PM). PM is a complex mixture of particles emitted during the crushing process, which is often visible and if not properly controlled, can become a nuisance. In most cases, however, the actual particles emitted from rock crushing operations are too large to be inhaled and do not pose any health-related risks.

- The TCEQ's permitting process has been developed through extensive and rigorous data analysis, which incorporates modeling, sampling, monitoring and toxicological information gathered and synthesized to ensure that human health and the environment are protected. The standards established by this process incorporate highly conservative assumptions that go well above and beyond the levels that would be considered to have any potential adverse impacts to human health and the environment.

TACA members minimize their environmental impact. They operate sustainable businesses. They seek to protect the public and communities from injury or property damage. They institute many practices that mitigate noise, dust and other considered nuisances, at their own expense.

TCEQ has broad enforcement authority to administer significant

TCEQ can and does seek administrative, civil and criminal penalties for environmental violations. The agency has the authority in administrative cases to levy penalties of up to $25,000 per day, per violation. In some programs, civil judicial cases carry penalties of up to $25,000 per day, per violation. TCEQ is statutorily required to issue any rock crusher operating without an air quality permit fines of up to $10,000 per day. TCEQ's enforcement actions are published in multiple places, including in the Texas Register and on TCEQ's website.

Regulated industries must maintain comprehensive records and "self-report" environmental

Facilities must maintain all compliance records on-site and be prepared to make them available to TCEQ upon request to prove they comply with any applicable permit requirements. Emission events must be reported within 24 hours of discovery. An emission event is defined as any upset or unscheduled maintenance, startup or shutdown activity from a common cause that results in unauthorized emissions of air contaminants from one or more emission points. These recordkeeping and reporting requirements ensure TCEQ can adequately monitor, enforce and foster regulatory compliance.

Practically every regulated industry in Texas is subject to some form of formal TCEQ-mandated recordkeeping and reporting equipment. Facilities regulated under a permit-by-rule (PBR) must maintain records on-site and be prepared to make them available to TCEQ upon request to prove they comply with the specific requirements of the PBR. These records are subject to TCEQ inspection. Formal recordkeeping requirements for facilities subject to Minor Source New Source Review permits are set forth in 30 TAC § 116.115(b)(2)(E). In certain cases, these records must be maintained for two- or five-year periods. Specifically, the rock crushing Standard Air Permit requires that the facility maintain logs of its daily hours of operation, the material throughput per hour, its road work and dust suppression, and a stockpile dust suppression log. These records must be maintained for two years. See e.g., *The TCEQ Air Quality Standard Air Permit for Permanent Rock and Concrete Crushers*, Effective Date July 31, 2008, Section (1)(M)).

Compliance data are also required to be maintained and reported. Similar to emission events, discharges and spills at regulated facilities must be reported with 24-hours. See e.g., 30 TAC § 327.1. A discharge or spill is defined as an act or omission by which oil, hazardous substances, waste or other substances are

spilled, leaked, pumped, poured, emitted, entered or dumped onto or into waters in the State of Texas or by which those substances are deposited where, unless controlled or removed, they may drain, seep, run, or otherwise enter water in the State of Texas. See 30 TAC § 327.2(3).

The TCEQ's environmental permitting process and enforcement process ensures that water quality is protected. TACA actively supports and promotes sustainable operational practices and policies that reflect sensible environmental stewardship of Texas' natural resources

State agencies, such as TCEQ, the Railroad Commission of Texas (RRC) and others, have regulatory oversight to protect groundwater quality. The TCEQ establishes the level of water quality, and it regulates pollutants that may affect groundwater quality. Local government regulate the spacing and production of water walls. There are nearly 100 local groundwater conservation districts operating throughout Texas. The districts regulate how much, how often and for what purpose groundwater can be used.

Like many other industrial operations, Aggregate Production Operations (APOs) must have wastewater discharge permits to legally operate their facilities in Texas to ensure that surface water quality is maintained. The most common wastewater discharge permit for aggregate facilities is the TCEQ Multi-Sector General Permit – MSGP – for Industrial Facilities (aka, TXRO50000). APOs often fall under Sector J of the MSGP for "mineral mining and processing facilities," which includes SIC 1442 - 1446 for sand and gravel mining and SIC 1422-1429 for crushed and broken stone. The MSGP requires an "annual comprehensive site compliance evaluation;" contains numeric effluent criteria for pH, TSS, and nitrates, as applicable; and requires self-reporting using "discharge monitoring reports." TCEQ administers other water quality protection programs on a more regional-specific basis, such as the John Graves Scenic

Riverway Permitting Program (specific to Palo Pinto and Parker Counties) and the Edwards Aquifer Program (specific to Medina, Bexar, Comal, Kinney, Uvalde, Hays, Travis and Williamson Counties). APOs often recycle their water for an efficient and conservative use of this precious resource.

TCEQ regulates groundwater quality, but does not regulate the *amount* of groundwater APOs use; however, in many cases groundwater used at the Aggregate Production Operation (APO) is regulated by a local groundwater district.

Groundwater conservation districts are units of local government with the authority to regulate the spacing and production of water wells. These locally-controlled administrative agencies are the state's preferred method for groundwater management.

There are almost 100 groundwater conservation districts operating through Texas. See **Appendix B.**, *Groundwater Conservation Districts of Texas, Texas Water Development Board (Map).*

As noted, groundwater conservation districts regulate how much, how often and for what purpose groundwater may be used. These districts are responsible for ensuring adequate groundwater availability, even in drought conditions. In cases where APOs utilize groundwater, these operations often recycle their water using clarifiers, flocculants and series of settling ponds. APOs have no incentive to "pump wells dry." Rather, it is to their benefit to responsibly use water. In fact, APOs often recycle more water than other "industries," such as golf courses, amusement parks and overly-irrigated landscapes common to high-end commercial and residential developments.

When working within the community, whether in quarries, along river beds or close to populated communities, TACA members follow best practices to ensure that the environment is protected and that its operations are run safely and within – and many times – exceeding requirements by the many agencies that regulate them.

New or modified APOs using the state highway system must construct entrances and driveways to TxDOT standards.

Truck traffic from new or expanding APOs is regulated under TxDOT requirements, especially those concerning driveway access to state highways. If a new turn lane or acceleration/deceleration lane is required, the APO must adhere to a "donation agreement," making it responsible for construction of the road improvement according to TxDOT design requirements.

TCEQ does not have regulatory jurisdiction over truck traffic. TCEQ rules prohibit anyone from causing a traffic hazard. Specifically, 30 TAC § 101.5 states, "No person shall discharge from any source whatsoever such quantities of air contaminants, uncombined water or other materials which cause or have a tendency to cause a traffic hazard or an interference with normal road use."

Nevertheless, on this issue and any other, TACA and its members believe in fostering productive and healthy community relations through constructive channels of dialogue that develop solutions to mitigate issues related to the production and transportation of aggregates, concrete, cement and related commodities.

Industry

Texas's growing economy and expanding infrastructure needs place great demand for construction materials. To be clear, raw construction aggregates, sand and cement are needed in vast quantities to build Texas. Fortunately, the marketplaces where these materials are needed the most, like in DFW, Austin, San Antonio and Houston, often have vast natural deposits of readily minable material. To date, Texas aggregate production companies have safely operated in close proximity to customers and end-users. Creating additional buffer zones above and beyond TCEQ's existing requirements for homes, schools or places of worship would effectively create a zone where no facilities would be permitted to operate, ever. This is not a practical outcome. By requiring facilities to move farther away from the marketplace, significant transportation and delivery costs will be added to an already stressed economy. To be clear, the delivered price of sand and gravel doubles at roughly 23 miles, while that of crushed rock doubles at 45 miles. Texas will see an additional 5.1 million residents in the next 10 years, which will require the use of over 35-50 million additional tons of stone, sand and gravel year after year. Pushing facilities farther away from where the products are needed will add a tremendous amount of cost to these materials, which are critical not only for private development, but also for all types of infrastructure and construction, including the roads and highways system managed by TXDOT.

This will also add more strain on that infrastructure – with the additional traffic as the materials are brought into these marketplaces from farther away, with additional (and unnecessary) miles being placed by delivery vehicles on an already taxed infrastructure system.

Aggregates have been quarried next to or within city limits of many cities in the world throughout history. The same is true in Texas. There are dozens of aggregate production quarries that safely mine inside the city limits or ETJ's of major municipalities in Texas. The existing rules are already rigorous and with a protective permitting system that ensures that human health and the environment are preserved. What creating additional and unnecessary buffers does is severely limit the ability of much-needed material to be brought to the marketplace. It results in imposing a silent tax on citizens that critically diminishes the buying power of Texas to address infrastructure needs, while at the same time placing a higher burden on it. Many APOs have operated for decades inside the city limits or ETJ of Marble Falls, for example.

As a practical matter, the population of Texas is growing at a significant rate per year. The State of Texas currently consumes approximately 2.0 yards per capita of concrete, 11 tons per capita of aggregate and about 0.6 tons per capita of cement. Effectively as population grows, the demand for aggregate, concrete and cement grows right along with it. This also means that aggregate, concrete and cement production facilities are integral to the growth and success of Texas communities.

Growth and development cannot happen without using aggregate materials produced from APOs and concrete from concrete batch plants. These facilities create skilled labor jobs and contribute a significant amount of taxes to local municipal revenues. An average concrete batch plant can employ 10 to 30 individuals. APOs often employ significantly more people. Mined rock or "crushed stone" is sold to end-users for concrete production, asphalt production, residential or commercial construction or highway construction. Rock quarries have historically operated near residential developments, hospitals, schools and day care facilities because it is the development of these structures that create the demand for the rock. Many APOs operate within the corporate city limits or extraterritorial jurisdiction of cities. TCEQ's environmental permitting process is thorough to ensure these facilities can operate safely in their communities. Excluding the PM10 non-attainment area designated within the city limits of El Paso, Texas is complying statewide at all other federally approved monitoring stations for both the PM10 and PM 2.5 National Ambient Air Quality Standards. If there were particulate matter issues, the vast monitoring system of the state would identify the issue and TCEQ would be statutorily obligated to address it, as it has in El Paso.

TACA members are part of the community:

TACA member companies and employees support social responsibility within the communities in which they live and work. This is demonstrated through active volunteerism and civic involvement with a host of community organizations and non-profits. For instance, member companies played a key role in responding to Hurricane Harvey and continue to help the Houston area on its road to recovery.

TACA will continue to work with stakeholders as we have been doing, and will further discussions on our industry and how we can successfully operate within our communities and support the growth that Texas is experiencing.

Texas Aggregates & Concrete Association

Appendix

Required permits and registrations for Aggregate Production Operations

- MSHA Registration and bi-annual inspections
- TXDOT approval of site entrance/exit, including applicable construction improvements of adjacent roadway through donation agreement between permittee and TXDOT
- TCEQ Air Quality Permits – Permits by Rule, Standard Air Permits or New Source Review Permits
- TCEQ Water Quality Permits – Wastewater Discharge (Texas Pollution Discharge Elimination System – TPDES – Industrial Storm Water Multi-Sector General Permit), Stormwater Pollution Prevention Plan
- TCEQ fuel storage tank registrations, (PST registrations)
- TCEQ Edwards Aquifer Protection Plan (if applicable) – Registration for water pollution abatement plan (WPAP)
- Local Zoning development or other municipal ordinances as applicable
- In addition to all related environmental permits (e.g., air, water and waste) APOs must register with the TCEQ and be inspected to verify all appropriate permits have been obtained.
- TCEQ Public Water Supply Permitting
  TCEQ/County OSSF (septic) Regulations
- Local Groundwater Conservation District Permitting
- EPA Chemical Inventory Reporting
- EPA Spill Plan and Prevention Countermeasures
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Required permits and registrations for Concrete Batch Plants

- TXDOT approval of site entrance/exit, including applicable construction improvements of adjacent roadway through donation agreement between permittee and TXDOT
- TCEQ Air Quality Permits – Standard Air Permits or New Source Review Permits
- TCEQ Water Quality Permits – Wastewater Discharge (Texas Pollution Discharge Elimination System
- TPDES – Industrial Storm Water Multi-Sector General Permit), Stormwater Pollution Prevention Plan
- TCEQ fuel storage tank registrations, (PST registrations)
- Local Zoning development or other municipal ordinances as applicable
- TCEQ Public Water Supply Permitting
- TCEQ/County OSSF (septic) Regulations
- Local Groundwater Conservation District Permitting
- EPA Chemical Inventory Reporting
- EPA Spill Plan and Prevention Countermeasures
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Required permits and registrations for Cement Plants

- MSHA Registration and bi-annual inspections
- EPA Air Quality Permits, Registrations and Certifications – Title 40 Code of Federal Regulations Part 60, Supbarts A, F, Y, OOO (New Source Performance Standards – NSPS), Clean Air Act Title V, 40 CFR 63, Supbarts A (General Provisions) and LLL – National Emission Standard for Hazardous Air Pollution (NESHAP) Certification and Reporting, Commercial and Solid Waste Incinerator (CISWI) Certification and Reporting, if applicable
- TCEQ Air Quality Permits – Title V Permit, Major New Source Review Permit, National Emission Standard for Hazardous Air Pollutant (NESHAP) Certification, in some cases Permits by Rule, Standard Air Permits
- TCEQ Water Quality Permits – Wastewater Discharge (Texas Pollution Discharge Elimination System – TPDES – Industrial Storm Water Multi-Sector General Permit), Stormwater Pollution Prevention Plan
- TCEQ fuel storage tank registrations, (PST registrations)
- TCEQ Solid Waste Requirements – Notice of Registration and Recycling reporting
- TXDOT approval of site entrance/exit, including applicable construction improvements of adjacent roadway through donation agreement between permittee and TXDOT
- Local Zoning development or other municipal ordinances, as applicable
- TCEQ Public Water Supply Permitting
- TCEQ/County OSSF (septic) Regulations
- Local Groundwater Conservation District Permitting
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Groundwater Conse of Texas

Confirmed Groundwater Conservation Districts *

1. Bandera County River Authority & Groundwater District - 11/7/1989
2. Barton Springs/Edwards Aquifer CD - 8/13/1987
3. Bee GCD - 1/20/2001
4. Blanco-Pedernales GCD - 1/23/2001
5. Bluebonnet GCD - 11/5/2002
6. Brazoria County GCD - 11/8/2005
7. Brazos Valley GCD - 11/5/2002
8. Brewster County GCD - 11/6/2001
9. Brush Country GCD - 11/3/2009
10. Calhoun County GCD - 11/4/2014
11. Central Texas GCD - 9/24/2005
12. Clear Fork GCD - 11/5/2002
13. Clearwater UWCD - 8/21/1999
14. Coastal Bend GCD - 11/6/2001
15. Coastal Plains GCD - 11/6/2001
16. Coke County UWCD - 11/4/1986
17. Colorado County GCD - 11/6/2007
18. Comal Trinity GCD - 6/17/2015
19. Corpus Christi ASRCD - 6/17/2005
20. Cow Creek GCD - 11/5/2002
21. Crockett County GCD - 1/26/1991
22. Culberson County GCD -5/2/1998
23. Duval County GCD - 7/25/2009
24. Evergreen UWCD - 8/30/1965
25. Fayette County GCD - 11/6/2001
26. Garza County UWCD - 11/5/1996
27. Gateway GCD - 5/3/2003
28. Glasscock GCD - 8/22/1981
29. Goliad County GCD - 11/6/2001
30. Gonzales County UWCD - 11/2/1994
31. Guadalupe County GCD -11/14/1999
32. Hays Trinity GCD - 5/3/2003
33. Headwaters GCD - 11/5/1991
34. Hemphill County UWCD - 11/4/1997
35. Hickory UWCD No. 1 - 8/14/1982
36. High Plains UWCD No.1 - 9/29/1951
37. Hill Country UWCD - 8/8/1987
38. Hudspeth County UWCD No. 1 - 10/5/1957
39. Irion County WCD - 8/2/1985
40. Jeff Davis County UWCD - 11/2/1993
41. Kenedy County GCD - 11/2/2004

Confirmed Groundwater Conservation Districts (Cont.) *

42. Kimble County GCD - 5/3/2002
43. Kinney County GCD - 1/12/2002
44. Lipan-Kickapoo WCD -11/3/1987
45. Live Oak UWCD - 11/7/1989
46. Llano Estacado UWCD - 11/3/1998
47. Lone Star GCD - 11/6/2001
48. Lone Wolf GCD - 2/2/2002
49. Lost Pines GCD - 11/5/2002
50. Lower Trinity GCD - 11/7/2006
51. McMullen GCD - 11/6/2001
52. Medina County GCD - 8/26/1991
53. Menard County UWD - 8/14/1999
54. Mesa UWCD - 1/20/1990
55. Mesquite GCD - 11/4/1986
56. Mid-East Texas GCD - 11/5/2002
57. Middle Pecos GCD - 11/5/2002
58. Middle Trinity GCD - 5/4/2002
59. Neches & Trinity Valleys GCD - 11/6/2001
60. North Plains GCD -1/2/1955
61. North Texas GCD - 12/1/2009
62. Northern Trinity GCD - 5/15/2007
63. Panhandle GCD - 1/21/1956
64. Panola County GCD - 11/6/2007
65. Pecan Valley GCD - 11/6/2001
66. Permian Basin UWCD - 9/21/1985
67. Pineywoods GCD - 11/6/2001
68. Plateau UWC and Supply District - 3/4/1974
69. Plum Creek CD - 5/1/1993
70. Post Oak Savannah GCD - 11/5/2002
71. Prairielands GCD - 9/1/2009
72. Presidio County UWCD - 8/31/1999
73. Real-Edwards C and R District - 5/30/1959
74. Red River GCD - 9/1/2009
75. Red Sands GCD - 11/5/2002
76. Reeves County GCD - 11/3/2015
77. Refugio GCD - 11/6/2001
78. Rolling Plains GCD - 1/26/1999
79. Rusk County GCD - 6/5/2004
80. San Patricio County GCD - 5/12/2007
81. Sandy Land UWCD - 11/7/1989
82. Santa Rita UWCD - 8/19/1989
83. Saratoga UWCD - 11/7/1989
84. South Plains UWCD - 2/8/1992
85. Southeast Texas GCD - 11/2/2004
86. Southern Trinity GCD - 6/19/2009
87. Southwestern Travis County GCD - 11/5/2019
88. Starr County GCD - 1/6/2007
89. Sterling County UWCD - 11/3/1987
90. Sutton County UWCD - 4/5/1986
91. Terrell County GCD - 11/6/2012
92. Texana GCD - 11/6/2001
93. Trinity Glen Rose GCD - 11/5/2002
94. Upper Trinity GCD - 11/6/2007
95. Uvalde County UWCD -9/1/1993
96. Victoria County GCD - 8/5/2005
97. Wes-Tex GCD - 11/5/2002
98. Wintergarden GCD - 1/17/1998

Other Districts **

Edwards Aquifer Authority
Harris-Galveston Subsidence District
Fort Bend Subsidence District

County Boundaries

Confirmed districts are arranged in alphabetical order.

Dates indicate when district was established by law or election.

* Districts that have, in whole or part, authority as assigned by Chapter 36 of the Texas Water Code. Please refer questions pertaining to individual districts to the district themselves. (www.twdb.texas.gov/groundwater/conservation_districts/index.asp)

** The subsidence districts and the Edwards Aquifer Authority are not groundwater conservation districts as defined under Chapter 36 of the Texas Water Code, but have the ability to regulate groundwater production (Senate Bill 1537 from the 79th Legislative Session and House Bill 2729 from the 86th Legislative Session).

Groundwater Conservation District GIS Data created by the Texas Commission on Environmental Quality. For more information, please contact TCEQ at 512-239-1000 or wras@tceq.texas.gov.

DISCLAIMER. This
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The scale and location of

TEXAS WATER DEVELO
1700 North Congress A
13231 Austin, Texas
www.twdb.tex
512-463-7

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