



State of Oregon Department of Environmental Quality

2021 Regional Haze Div. 223 Fiscal Impact Statement

Fiscal and Economic Impact

The proposed rules codify the methodology by which DEQ screened and identified facilities that must install pollutant controls or reduce emissions of Round 2 regional haze pollutants. The proposed rules would also establish what action is required of those identified regulated sources through a number of compliance options. The proposed rules have four elements:

- DEQ completes an initial screening based on facility emissions and distance to Class 1 areas to determine what facilities will be regulated under the proposed rules;
- Regulated facilities are required to undertake an analysis to determine the feasibility and cost-effectiveness of pollutant controls; and
- Regulated facilities may choose a compliance path and request to enter into an agreement with DEQ that will achieve required emission reductions by a time certain; or
- DEQ issues orders to regulated facilities to install pollution control equipment by a time certain.

DEQ has already implemented the first two elements of the proposed rules under its existing authority (OAR 340-214-0110). DEQ doesn't expect that facilities incurred costs at the initial screening because the initial screening does not involve any input from facilities but is calculated based on information already in DEQ's possession. DEQ expects that regulated facilities did incur costs when they were required to analyze the feasibility of pollution controls and will incur costs when they either agree to a compliance path or DEQ orders them to take certain compliance actions.

Statement of Cost of Compliance

State agencies

No state agencies are regulated facilities under the proposed rules, so this rulemaking does not impose any mandatory requirements for state agencies and, accordingly, does not impose any direct compliance costs.

DEQ and possibly LRAPA staff will implement the proposed rules. The fiscal effects on DEQ and LRAPA include dedicating resources such as permit writers, inspectors, compliance and enforcement staff, and management oversight. DEQ does not expect any other state agency to be fiscally affected by the proposed rules.

Local governments

No local governments are regulated facilities under the proposed rules, so this rulemaking does not impose any mandatory requirements for local governments and, accordingly, does not

impose any direct compliance costs. DEQ does not expect local governments to be fiscally affected by the proposed rules.

Public

The rulemaking does not impose any mandatory requirements for the public at large and, accordingly, does not impose any direct compliance costs on the public. DEQ addresses the potential for the proposed rules to increase the cost of building materials in the Housing Cost section of this document.

DEQ expects the proposed rules to have indirect, broad and positive fiscal effects on the public, particularly people living or working near regulated facilities, through community health improvement and reduced health care costs. Pollution control equipment required through the proposed rules reduces the general public's exposure to Round 2 regional haze pollutants: NO_x, PM, and SO₂.

Short-term health effects of NO_x exposure include respiratory irritation, which can exacerbate existing respiratory diseases, like asthma. NO_x also leads to secondary formation of PM and ozone, each of which can lead to short-term respiratory impairment and long-term health effects, such as greater susceptibility to respiratory disease.¹ Adverse health effects of PM exposure include both respiratory and cardiovascular impairment and damage, up to premature death for vulnerable populations.² Exposure to SO₂ causes short-term respiratory impairment and may lead to long-term respiratory damage and, as with NO_x and PM exposure, most adversely affects older people, children, and those with respiratory diseases.³

DEQ is not aware of calculated public health costs saved from this rulemaking but refers to information available through the Oregon Health Authority that estimates the health burden costs from diseases exacerbated by air pollution (Table 1). According to OHA 2017 data and analysis, lower respiratory disease is the fifth leading cause of death for Oregonians.⁴ A comprehensive 2002 study assessed the contribution of pollution to disease and found that 10-30% of asthma is attributable to outdoor air pollution (including both industrial and non-industrial sources). In the early 2000s, the yearly fraction of asthma cases that could be attributed to environmental factors cost the US between \$0.7 and \$2.3 billion. These cost estimates account for direct medical costs and lost productivity due to asthma-related premature deaths.⁵

¹ Environmental Protection Agency. Basic information about NO₂. <https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects>, accessed 05/06/21.

² Ibid. Health and Environmental Effects of Particulate Matter. <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>, accessed on 05/06/21.

³ American Lung Association. Sulfur Dioxide. <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/sulfur-dioxide>, accessed on 05/06/21.

⁴ <https://www.oregon.gov/OHA/PH/ABOUT/Documents/indicators/leadingcausesofdeath.pdf>

⁵ Landrigan PJ, Schechter CB, Lipton JM, Fahs MC, Schwartz J. Environmental pollutants and disease in American children: estimates of morbidity, mortality, and costs for lead poisoning, asthma, cancer, and developmental disabilities. *Environ Health Perspect.* 2002 Jul;110(7):721-8.

Table 1 Public Health Costs from Diseases Exacerbated by Air Pollution			
Health Outcome	Description	Average Annual Cost of Each Case	Estimated Annual Medical Costs in Oregon^{6,7}
Asthma	Estimates for adults and children	\$2,740	\$411 million
Cardiovascular disease	Estimates for adults only - hypertension, stroke, coronary heart disease, congestive heart failure, other	\$2,220- \$16,760 (disease- specific)	\$3.6 billion ⁸

Large businesses - businesses with more than 50 employees

DEQ does not expect a fiscal impact for large businesses that are not regulated facilities. DEQ expects that large businesses that are regulated facilities will incur fiscal impacts from the proposed rules. The application of the initial screening in the proposed rules identified 32 large businesses as regulated facilities and DEQ required those facilities to conduct further analysis of their emissions and pollution controls. The proposed rules codify the requirement that those businesses conduct an analysis to identify emission control measures and to characterize four factors: cost, time to install, remaining useful life, and energy/non-air effects. DEQ expects regulated large businesses may use internal technical and professional resources or may contract with a consulting firm to fulfill the four factor analysis component of the proposed rules. DEQ estimates that a complex four factor analysis may require approximately 120 hours of professional time, at a rate of \$200/hr. In Table 2, DEQ provides a range of costs a large businesses may incur to complete a four factor analysis, either in-house or through a consultant. DEQ acknowledges that a facility may use both consultant and in-house resources to conduct a four factor analysis and therefore the costs in Table 2 may be additive.

Table 2 Cost of Completing Four Factor Analysis	
Consultant Fees	Facility Professional Resources
\$5,000 - \$25,000	\$5,000 - \$25,000

⁶ Calculated using the CDC Chronic Disease Cost Calculator – see footnote 7 – based on 2008 prevalence and cost statistics and 2010 census data. Estimates are limited to medical expenditures and do not include indirect costs such as missed days of work and school.

⁷ Estimated medical treatment costs of chronic diseases, Oregon 2010.

https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/CHRONICDISEASE/DATAREPORTS/Documents/datatables/CDCC_2010.pdf

⁸ This cost estimate integrates costs of all cardiovascular disease without double counting costs of treatments for comorbid cardiovascular conditions.

The proposed rules allow regulated facilities two compliance options. A regulated facility may enter into an agreement with DEQ to timely reduce emissions or install controls that DEQ determines are cost-effective. DEQ will issue orders to regulated facilities that do not enter into agreements with DEQ to install pollution controls by a time certain. The costs of control installation and maintenance depends on the number and size of emission units. Table 3 lists estimated cost ranges for pollution control equipment that reduces emissions of Round 2 regional haze pollutants. DEQ estimated Table 3 costs from information and vendor quotes that facilities submitted in the response to the agency's request that facilities provide this information under OAR 340-214-0110.⁹ DEQ drew costs for electrostatic precipitation and baghouses from the Cleaner Air Oregon rulemaking fiscal impact statement.¹⁰

A facility may decide that replacing an emission unit or emissions units is more feasible or cost effective than installing controls or otherwise reducing emissions from that unit or units. The proposed rules allow DEQ to enter into settlement agreements where facilities agree to replace emission units by a time certain as a means to reduce emissions. The cost of replacing an emission unit or units will depend on multiple factors specific to individual facilities and their operational needs, most significantly based on the type of facility and emissions unit or units being replaced. Due to such variability among facility and emission unit types, DEQ is unable to quantify the potential magnitude of such costs at this time. DEQ would expect a facility to find unit replacement costs competitive with other compliance options if that facility was already planning unit replacement for another reason, and that a facility would not choose this option if the costs of another compliance option described in this fiscal impact statement were less than the costs of replacement. No facilities will be required to replace emissions units; this is an option made available to facilities in the proposed rules and that facilities may voluntarily choose as a compliance option. Thus, DEQ would expect that this option would not be likely to result in greater costs than the costs of other compliance options, and if it were, then it would be due to a facility's voluntary choice to incur such costs, and not the least cost option under these proposed rules.

⁹ <https://www.oregon.gov/deq/aq/Pages/haze-ffa.aspx>

¹⁰ <https://www.oregon.gov/deq/Rulemaking%20Docs/cao-pn2notice.pdf>

**Table 3
Cost of Pollution Control Installation and Maintenance**

Pollution Control Device	Applicable to	Pollutant Controlled	Installation	Operations and Maintenance
Low NO _x Burner - LNB	combustion of natural gas	NO _x	\$10 - 45 thousand per MMBtu/hr of equipment capacity	\$1 - 5 thousand/year, per MMBtu/hr of equipment capacity
Selective Catalytic Reduction - SCR	combustion	NO _x	\$3 - 30 million	\$0.1 - 4 million/year
Selective Non-Catalytic Reduction - SNCR	combustion	NO _x	\$1 - 6 million	\$50 - 500 thousand/year
Electrostatic Precipitation - ESP	equipment that generates fine particulate matter	PM	\$0.3 - 8 million	\$0.1 - 8 million/year
Catalytic Ceramic Filters - CCF	glass furnaces	NO _x , PM ₁₀ , SO ₂	Approximately \$5,000 per ton of pollutant removed	
Ultra Low Sulfur Diesel Fuel - ULSD	equipment formerly using high-sulfur #6 Fuel Oil as backup	SO ₂	No additional cost. No additional changes to site.	
Baghouse	dust-generating equipment	PM ₁₀	\$0.3 - 20 million	\$0.1 - 7 million/year
Low Emission Combustion - LEC	reciprocating natural gas compressor engines	NO _x	\$2 - 5 million per engine	\$2 - 300k/year per engine

Under the proposed rules, regulated facilities may enter into stipulated agreements with DEQ or DEQ issues an order to the facility requiring the facility to reduce emissions or install controls by a time certain. To fulfill the agreements or comply with DEQ's orders, regulated facilities may incur fees for permit revisions. There may also be costs to some facilities for a notice to construct and, under certain conditions, a construction Air Contaminant Discharge permit. Table 4 lists the permitting costs that regulated facilities may incur. DEQ also included consulting costs in Table 4 based on a comment received in the FAC meeting.

Multiple FAC members also recommended that DEQ acknowledge the potential adverse environmental effects and cost that facilities may incur by installing certain pollution controls, such as Selective Catalytic Reduction and Selective Non-Catalytic Reduction. FAC members commented that these technologies require additional electricity use, result in greater greenhouse gas emissions, and may lead to ammonia emissions; ammonia is a hazardous air pollutant subject to regulation under Cleaner Air Oregon – DEQ's air quality permitting program for toxic air contaminants.

DEQ acknowledges that some, though not all, pollution controls for NO_x, PM and SO₂ will increase a facility’s energy use and energy costs. The proposed rules would codify the Four Factor Analysis process required by the Regional Haze Rule and used to identify reasonable and feasible controls. The fourth factor of this analysis is “energy and non-air effects.” The proposed rules allow for energy use, and associated costs, to be considered and balanced among other factors in identifying feasible and reasonable controls.

DEQ would expect energy use, additional greenhouse gas emissions and cost to vary depending on several facility-specific and control-specific characteristics. For example, some control devices may reduce greenhouse gas emissions by tuning a boiler to run more efficiently; some may increase greenhouse gas emissions if emissions require reheating to reach reaction temperature (e.g. SCR). Even if additional heat is required, in some cases, that could be supplied by waste heat, not requiring more energy use.

Regarding ammonia emissions from SCR and SNCR, some systems include ammonia monitoring and adjustment to minimize usage and “slip.” According to DEQ Cleaner Air Oregon technical staff, some sources may be required to monitor, report and potentially perform mass balance calculations for ammonia that had not been required before installing SCR or SNCR. DEQ would not expect ammonia slip to contribute significantly to the toxic air contaminant risk from a facility’s emissions as ammonia has low toxicity. DEQ concludes that potentially adverse environmental effects and costs that a facility may incur from operating SCR and SNCR, including additional energy use and permit compliance, would not necessarily eliminate these technologies as feasible and cost effective controls.

Table 4 Permitting Costs			
Notice to Construct	Construction ACDP*	Specific Activity Fees Existing Source Permit Revisions 340-220-0050(2)(a)	
\$720	\$14,400	Administrative	\$510
		Simple	\$2,041
		Moderate	\$15,306
		Complex	\$30,612
Consulting Fees		\$10,000 - \$30,000	

* If Construction ACDP fulfills Title V format, procedures and public notice requirements, DEQ may revise the Title V permit through an administrative amendment.

Small businesses – businesses with 50 or fewer employees

No small businesses are regulated facilities under the proposed rules, so this rulemaking does not impose any mandatory requirements for small businesses and, accordingly, does not impose any direct compliance costs.

Some small businesses may be indirectly affected by the proposed rules. DEQ anticipates that such small businesses will see a positive fiscal impact. DEQ does not currently know how many small businesses would be impacted by the proposed rules because DEQ does not have information about the extent to which different kinds of small businesses benefit from visitors to Class 1 areas. The types of small businesses that may be impacted by the proposed rules include those in the tourism, leisure and hospitality industry in areas of the state welcoming visitors to wilderness areas, the Columbia River Gorge National Scenic Area, and Crater Lake National Park. National Parks and wilderness areas attract tens to hundreds of thousands of visitors each year. According to the US Forest Service National Visitation Monitoring system, in 2016, more than 200,000 people visited the Mt. Hood Wilderness area and more than 3 million visited the Columbia Gorge National Scenic Area.¹¹ In 2019, approximately 27,000 people visited wilderness areas in the Wallowa Whitman National Forest,¹² the largest of which are Eagle Cap and Hells Canyon (in 2016 and 2019, respectively) and more than 700,000 visited Crater Lake National Park.¹³

In Oregon, the tourism industry is mainly composed of small businesses, according a recent report from the Oregon Employment Department, “Of Oregon’s 204,612 leisure and hospitality jobs in March 2020, 125,778 were in establishments with 10 to 49 workers.”¹⁴

According to the Oregon Employment Department, in 2019, approximately \$5 billion in wages were paid within the Leisure and Hospitality industry sector, employing more than 200,000 people in more than 14,000 businesses. Counties containing Class 1 wilderness areas and national parks, are among those deriving a relatively high percentage of employment income from travel and tourism, compared to all industry totals.¹⁵ Note in Figure 1 relatively high leisure and hospitality quotients in Hood, Deschutes, Klamath and Wallowa Counties.¹⁶

¹¹ US Forest Service, National Visitor Use Monitoring <https://apps.fs.usda.gov/nvum/results/A06022.aspx/FY2016>

¹² *Ibid.*

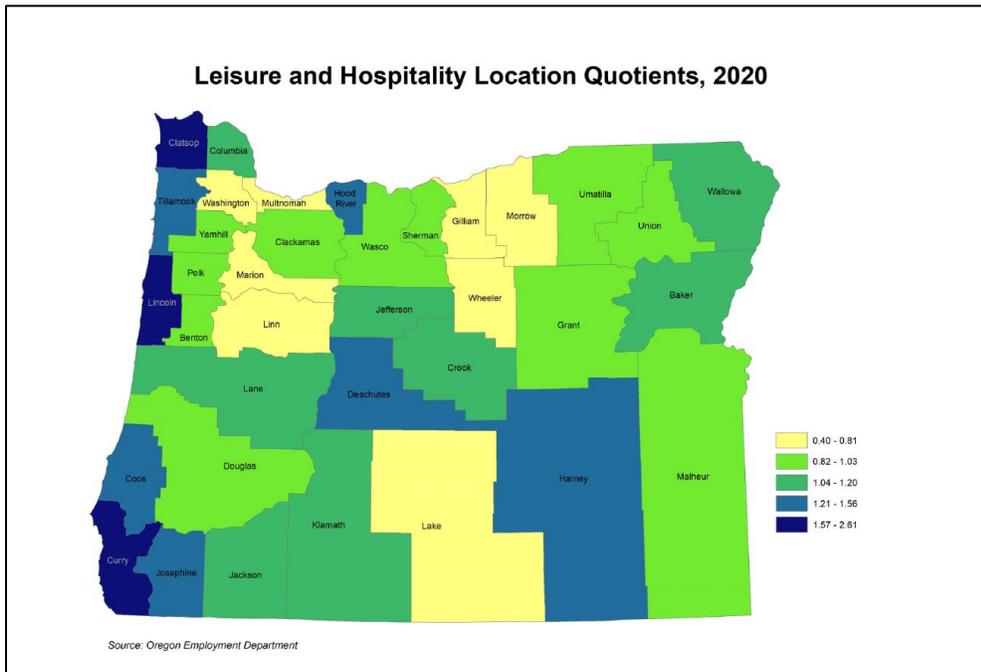
¹³ <https://www.nationalparked.com/crater-lake/visitation-statistics>, accessed on 05/06/21.

¹⁴ Oregon Employment Dept. (March 2021), <https://www.qualityinfo.org/-/oregon-s-leisure-and-hospitality-industry>

¹⁵ *Ibid.*

¹⁶ *Ibid.*

Figure 1: Leisure and hospitality quotients in Oregon counties. Source: Oregon Employment Department



a. Estimated number of small businesses and types of businesses and industries with small businesses subject to proposed rule.

None of the businesses regulated by the proposed rules are small businesses. DEQ confirmed this through a review of the US business database, Reference USA.com.

b. Projected reporting, recordkeeping and other administrative activities, including costs of professional services, required for small businesses to comply with the proposed rule.

None

c. Projected equipment, supplies, labor and increased administration required for small businesses to comply with the proposed rule.

None

d. Describe how DEQ involved small businesses in developing this proposed rule.

DEQ did not involve small businesses in developing the proposed rules because no small businesses are regulated by the proposed rules.

Documents relied on for fiscal and economic impact

Document title	Document location
US Business Database	ReferenceUSA.com
Oregon Employment Department. Oregon Leisure and Hospitality Industry (Tauer, G., 2021)	https://www.qualityinfo.org/-/oregon-s-leisure-and-hospitality-industry
Four Factor Analysis Documents	https://www.oregon.gov/deq/air/Pages/haze-ffa.aspx
DEQ Fiscal Impact Statement, Cleaner Air Oregon Rulemaking	https://www.oregon.gov/deq/Rulemaking%20Docs/cao-pn2notice.pdf
Oregon Health Authority. Estimated medical treatment costs of chronic diseases, Oregon 2010	https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/CHRONICDISEASE/DATAREPORTS/Documents/datatables/CDCC_2010.pdf
US Forest Service. National Visitor Use Monitoring System	https://apps.fs.usda.gov/nvum/results/A06022.aspx/FY2016
Environmental Protection Agency. Basic information about NO2.	https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects .
Environmental Protection Agency. Health and Environmental Effects of Particulate Matter.	https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm .
American Lung Association. Sulfur Dioxide.	https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/sulfur-dioxide .
Oregon Health Authority. Leading Causes of Death.	https://www.oregon.gov/OHA/PH/ABOUT/Documents/indicators/leadingcausesofdeath.pdf
Environmental pollutants and disease in American children: estimates of morbidity, mortality, and costs for lead poisoning, asthma, cancer, and developmental disabilities. Landrigan PJ, Schechter CB, Lipton JM, Fahs MC, Schwartz J.	J. Environ Health Perspect. 2002 July; 110(7):721-8.

Advisory committee fiscal review

DEQ appointed a fiscal advisory committee.

As ORS 183.333 requires, DEQ asked for the committee's recommendations on:

- Whether the proposed rules would have a fiscal impact;
- The extent of the impact; and
- Whether the proposed rules would have a significant adverse impact on small businesses; if so, then how DEQ can comply with ORS 183.540 reduce that impact.

The committee reviewed the draft fiscal and economic impact statement and its findings are stated in the approved minutes dated May 17, 2021. Committee members generally agreed that the proposed rules will have a fiscal impact on large businesses that are Title V facilities to be regulated by these proposed rules. Committee members had differing opinions on the extent of the fiscal impact and multiple committee members stated that the draft fiscal impact statement did not contain sufficient information for committee members to formulate an opinion on the extent of fiscal impact. Multiple committee members stated that they would not expect the proposed rules to have a significant adverse impact on small business because the proposed rules only regulate Title V permitted sources. Multiple committee members stated they were uncertain if the proposed rules would have a significant adverse impact on small business or that the draft FIS did not include sufficient information to answer the question.

Additional highlights of the committee deliberations and comments are:

- Multiple committee members stated that the information that DEQ provided – a summary table of potential control technology and its cost ranges – is insufficient without information that reveals which facilities will install which controls.
- Some members stated DEQ hasn't provided sufficient information for the committee to determine extent of fiscal impact. One member stated, in order-of-magnitude numbers, the fiscal impact of the proposed rules is tens to hundreds of millions of dollars.
- Multiple committee members stated there is uncertainty about the extent of the fiscal impact and for whom that may be adverse. Members stated there is uncertainty whether or not a business that is not regulated, such as a permitted industry that is not Title V, would sustain any fiscal impact.
- Multiple committee members stated that the fiscal impact statement only addresses costs of controls at facilities, but doesn't address cost to the state economy and business potentially indirectly affected by the proposed rules – a “ripple” or “trickle down” effect.
- Multiple committee members stated that the companies to be regulated under the proposed rules are located in rural areas. Members stated that the millions of dollars for pollution control would otherwise be put into the local economy through plant expansions and improvements, thereby indirectly supporting small businesses in the area. One member recommended that DEQ contract with an economics firm to analyze the effects of the proposed rules on rural economies.
- Multiple members stated that among fiscal impacts, DEQ should consider associated public health benefits of the proposed rules, such as fewer asthma attacks and less exacerbation of chronic obstructive pulmonary disease.
- Some committee members stated that the fiscal impacts sustained by regulated industry would be disproportionate to the facilities' impacts on regional haze, as measured by visibility.
- One committee member stated that large businesses cannot always pass additional cost along to customers, particularly in a commodity market. Even within a large business, each individual facility, such as a mill, has to make a contribution and money spent on pollution control at the facility cuts into profit. The costs from the proposed rules may or

may not cause the industry to shut down or sell an individual mill – those decisions would depend on the financial health of that mill.

- Multiple committee members encouraged fiscal impact assessment on a broader scope to encompass public health savings, watershed protection in national parks and wilderness, impacts on tourism, and health and economic benefit for people who live and work in the surrounding areas.
- One committee member stated that some pollution control measures, specifically SNCR and SCR, increase pollution in other media, require more electricity use, increase greenhouse gases from combustion, and add ammonia, a hazardous air pollutant. The committee member recommended that DEQ consider these greenhouse gas, electricity and hazardous air pollutants costs.
- One member stated that air quality and visibility has been studied extensively in the Columbia River Gorge National Scenic Area and large stationary sources as well as mobile sources are large contributors to haze.
- Multiple committee members stated that either there were no direct effects from the proposed rules on small businesses, since they were not regulated by the proposed rules, or that fiscal effects on small business were unclear. One committee member stated small business effects were indeterminate because DEQ had not provided a list of which facilities will be installing controls.
- One committee member stated that one way for DEQ to mitigate any potential effect on small business would be to compare Oregon’s regional haze screening procedures to those of surrounding states and comport with them.
- One committee member recommended that DEQ consider the benefits to small businesses that install and maintain pollution controls

DEQ allowed FAC members to submit additional information or written comments to DEQ by close of business on May 24, 2021. Three committee members submitted written comments.

Based on FAC deliberations and comments received, DEQ added the following information to the fiscal impact statement that was incorporated into the public notice:

- Acknowledged additive consultant and in-house costs for four factor analysis in Table 2.
- Added consultant fees to permitting costs in Table 4.
- Added a discussion to summarize potential environmental and energy costs of installing SNCR or SCR pollution controls.
- Attachment: Table A-1, Facilities regulated by the proposed rule based on the initial screening.
- Attachment: Table A-2, DEQ findings for facilities after initial screening.

Housing cost

As ORS 183.534 requires, DEQ evaluated whether the proposed rules would have an effect on the development cost of a 6,000-square-foot parcel and construction of a 1,200-square-foot

detached, single-family dwelling on that parcel. A memorandum¹⁷ pertaining to a study conducted by the University of Oregon to support Oregon Department of Land Conservation and Development rulemaking describes the major factors influencing the cost of residential housing construction. Cost components include land, material and labor and regulatory costs such as permits, compliance with zoning requirements and system development charges.

DEQ acknowledges the proposed rules have the potential to affect housing development costs because some of the large businesses regulated by the proposed rules are in the lumber products industry or otherwise produce building materials. DEQ would not expect any increase in regulatory compliance costs for the lumber industry, over current compliance costs, to be significant enough to affect the cost of building materials. DEQ does not expect the proposed rules to have any effect on the major cost components of residential construction such as cost of land, labor, or permitting or zoning regulations.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

¹⁷ University of Oregon, 2016. Cost Components of Housing. https://www.oregon.gov/lcd/UP/Documents/UO-Cost_Components.pdf accessed on 05/07/21.