

Alaska Oil and Gas Association



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October 24, 2017

Mr. John Larsen, Audit Master
Tax Division, Alaska Dept. of Revenue
550 West 5th Avenue, Suite 500
Anchorage, AK 99501

Re: Oil and Gas Properties Tax (AS 43.56) - Proposed Amendments to 15 AAC 56.100
Valuation of Production Property

Dear Mr. Larsen:

Enclosed for the record are comments of the Alaska Oil and Gas Association (“AOGA”) and its members regarding the proposed amendments to 15 AAC 56.100. For nearly half a century AOGA has been the trade association of the petroleum industry in Alaska, and our members actively continue to explore for, develop, produce, transport, and refine oil and gas in the state. In keeping with our practice regarding tax matters, all our members have had the opportunity to review and comment on these comments here as they were being developed, and they have been approved without dissent.

The Department of Revenue gave public notice of these proposed amendments on September 18, 2017, following its “Property Tax Workshop” held in Anchorage on July 11, 2017.

Please contact me if the Department has any questions or comments regarding these comments.

Very truly yours,

ALASKA OIL AND GAS ASSOCIATION

A handwritten signature in black ink that reads 'Kara Moriarty'.

Kara Moriarty
President/CEO

Cc: Commissioner Sheldon Fisher, Department of Administration
Attorney General Jahna Lindemuth

Alaska Oil and Gas Association



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COMMENTS OF THE
ALASKA OIL AND GAS ASSOCIATION (“AOGA”)
REGARDING PROPOSED AMENDMENTS TO 15 AAC 56.100
PERTAINING TO THE VALUATION UNDER AS 43.56 OF
PROPERTY USED OR COMMITTED FOR USE IN OIL AND GAS PRODUCTION

OCTOBER 24, 2017

The proposed amendments would REDUCE the State’s overall tax revenue. The proposed amendments would materially increase the assessed value of the “production property”^{1,*} they are applied to. Since the tax under AS 43.56 is a flat 20 mills, the result would similarly be a material increase in the property tax on that production property. Yet, despite this, the State stands to lose tax revenue overall because of two things.

First, roughly 90 percent of the production property in Alaska is located on the North Slope. The North Slope Borough’s property tax — currently 17.99 mills in 2017 — is a credit under AS 43.56.010(d) against the State’s 20- mill tax. This means $\frac{17.99}{20}$ or 90% of the increase in tax under the proposed amendments would go to the Borough and 10% to the State.

Second, the entire amount of the 20-mill tax on production property is a “lease expenditure”² under the Oil and Gas Production Tax in AS 43.55.011, which normally[†] is 35% of the “net” value of North Slope production after lease expenditures for that production.

Thus, for each dollar of additional property tax for North Slope production property that the proposed regulations would generate, the State would receive only a dime of that property tax while forgoing 35 cents in production tax under the Spring 2017 revenue forecast.³

* Endnotes like the adjacent one here (setting out the statutory definition of “production property”) provide primarily technical information or documentation, they are indicated by being numbered, and they appear at the end of this document in the “ENDNOTES” section. Footnotes supplement the substance of the text they appear with and are at the bottom of the page the text is on so one can see the supplement at the same time.

† Under AS 43.55.011(f) production tax for North Slope production is based on 4% of the “gross” value of taxable production if this is greater than the 35% tax on the “net” value for an entire calendar year. The 4% rate steps down by one percentage-point at a time if the West Coast spot price of North Slope oil averages \$25 a barrel or less for the year, becoming zero if that average is at or below \$15.

The “scaled-production” valuation methodology^{*} is not authorized under AS 43.56.060(d). AS 43.56.060(b) requires that “[t]he department shall[†]” assess property for the taxes levied under AS 43.56.010(a) *at its full and true value*” (emphasis added). AS 43.56.060(d) prescribes that this “full and true value” is to be determined for production property “on the basis of replacement cost less depreciation based on the economic life of proven reserves.”⁴

Slide 6 of Assessor Greeley’s slides at the Workshop shows the assessment of production property as having two “Phase[s]”. The first is the “Pre-Decline Phase (ramp up or plateau production)” when the cost of a production facility is depreciated on a straight-line basis at 1% per year. Phase 2 is the “Decline Phase” when the scaled-production methodology applies, and it begins when “current” production (i.e., production during the calendar year immediately before the year for which the assessment is being made) is “10% or more off peak or plateau production[.]”

During Phase 2, the assessed value of production property equals its replacement cost new, times a factor reflecting its “percent good” — which is “the inverse of depreciation[.]” *Greeley Slide 8 (“Updated 7-12-2017”)*. This “percent good” equals —

$$(\text{Reservoir Current Production} / \text{Reservoir Historic Peak Production}) \wedge \text{SF}$$

where “ \wedge ” indicates that the term following it is an exponent for the term preceding it, and “SF” is a number that, in Assessor Greeley’s slide, is chosen to be 0.69. *Id.*

The legal failing of this approach lies in the fact that, in Phase 2 (which is most of the life of a production property), the assessed value would be determined by “Current Production” and “Historic Peak Production” — and neither of these production volumes, nor the ratio of either volume to the other, is “based on the economic life of proven reserves” as AS 43.56.060(a) and (d) require. “Economic life” is inherently temporal, while “Production” is physically volumetric. Logically they cannot be the same.

The Tax Division cannot use administrative efficiency as the justification for ignoring the statutory requirement to calculate depreciation based on the economic life of proven reserves. The statute makes no mention of current versus peak production as the measure of depreciation. The Alaska State Legislature has voiced its intent through clear statutory language and the

* The discussion of the scaled-production methodology in this section and the following one relies on the description of the methodology by Jim Greeley, State Petroleum Property Assessor, during the Property Tax Workshop held by the Tax Division in Anchorage on July 11, 2017, and particularly slides 6 – 12 of his presentation.

† The use of “shall” here makes this sentence mandatory for the Department to follow. See Legislative Affairs Agency, Alaska State Legislature, *Manual of Legislative Drafting* (Juneau: 2017) at 65:

Use the word “shall” to impose a duty upon someone. The Alaska Supreme Court has stated that the use of the word “shall” denotes a mandatory intent. Fowler v. Anchorage, 583 P.2d 817 (Alaska 1978).

. . . For example:

The commissioner shall issue a license . . . , i.e., it is the commissioner’s duty to do so.
[underscoring and unspaced ellipsis in original]

Department must abide by that intent.*

The proposed depreciation methodology's disconnect from the economic life of proven reserves is exacerbated by the methodology's exclusive focus on current versus peak production without considering age-life depreciation, functional obsolescence (cost to cure) or external obsolescence such as super-adequacy. Simply put, the scaled production methodology only estimates external/economic obsolescence. It does not approximate excess cost, physical deterioration or functional obsolescence, and represents only the level of economic obsolescence inherent in the facility due to lack of utilization or inutility over the life of the asset — again, based on production and not the economic life of proven reserves.

In regard to functional obsolescence, the proposed methodology uses only a utilization adjustment based on current versus peak throughput and thus disregards actual capacity. If a field's production never reaches actual capacity of the production properties, the methodology fails to capture a meaningful component of obsolescence, but would ostensibly capture the cost of that excess capacity in the replacement cost. The taxpayer would suffer the burden of excess cost that does not add value, but would not be allowed depreciation for it.

The proposed methodology is not a proxy for both depreciation and obsolescence. Even if utilization is maintained at 100%, depreciation should still occur, and obsolescence may occur as well. The methodology makes no provision for these scenarios and its failure to capture depreciation is particularly acute for properties that are in the "pre-decline phase." The allowance of 1% per year is simply not adequate given the substantial depreciation that occurs early in the life of a field. The proposed regulations do not indicate whether the Department intends to adjust costs for inflation as it has in the past, but such an adjustment could be greater than 1% per year. The result would be no meaningful depreciation for a number of years. The argument that depreciation would be captured when the field is in decline lacks merit from a time value of money perspective.

The proposed regulations would also likely generate other unreasonable and incongruous results. For instance, a taxpayer that is optimizing production may not benefit from the depreciation required by statute. Further, once production drops below the arbitrary 90% threshold, the assessed value of the property may actually rise due to decreased depreciation attributable solely to the proposed methodology. In turn, a subsequent rise in production above the 90% threshold may raise the assessed value in a later year due to the reversion back to the previous percent good.

We are also concerned about the proposed methodology's treatment of wells. The proposed regulations make no mention of how wells will be treated. If the methodology will be applied to wells, we have the same concerns — depreciation would not be based on proved reserves and the methodology fails to address age/life depreciation and functional obsolescence and only captures

* "While every word of a statute must be presumed to have been used for a purpose, . . . every word excluded from a statute must be presumed to have been excluded for a purpose." *Ganz v. Alaska Airlines, Inc.*, 963 P.2d 1015, 1019 (Alaska 1998).

some form of economic obsolescence. Also, although wells that are plugged and abandoned should not be subject to property tax, wells that are suspended have been taxed in the past and additional depreciation is warranted if they will be taxed in the future. Taxing suspended wells without a “shut-in factor” to reflect their status would be unreasonable and a departure from the Department’s past practice.

Greeley Slides 2 and 3 appear to be trying to justify the “percent good” approach in the scaled-production methodology on the ground that production property is “special purpose” property and there is a very “limited market” for it which are similar to the situation with TAPS, and assessment of production property on the basis of replacement cost new minus cumulative depreciation has been “[p]hased out by DOR over the last four years with municipal and taxpayer review and input[.]” *Greeley Slide 4.*

These rationalizations are erroneous and readily debunked. First, there have been a number fairly recent sales of working interests in fields on the North Slope and in Cook Inlet, which offer market data. And there is always the possibility of more. So, instead of abstract, theoretical constructions about what the market might be now or might have been, the Department should take advantage of the present availability of empirical data that have not gone stale.

Second, about the alleged precedent⁵ from the assessments for TAPS, to the extent there is such precedent, TAPS is a pipeline – not a production property – and so its assessment valuation is inapplicable here because production property is assessed under a separate, and substantively different, subsection of AS 43.56.060 from the one for TAPS.

And third, any “phase out” of assessment methodology that may have happened “over the last four years with municipal and taxpayer review and input” does not, and cannot, amend the statute. Only the legislature — or the people of Alaska by initiative or referendum — can enact, amend or repeal statutes. Until one of these happens, the Department is legally bound by what the statute requires, and any amendment to 15 AAC 56.100 that is inconsistent with the statute would not be “valid or effective” under AS 44.62.030 in the Administrative Procedure Act and could be challenged in court under AS 44.62.300(a) on this ground.

Substantive flaws and omissions in the proposed amendments. Quite apart from the legal problems and concerns discussed above, there are a number of defects, problems and issues about how the proposed amendments, if adopted, would operate in practice.

The exponent. 15 AAC 56.100(a)(3) describes how the exponent would be applied to the current-vs.-peak-production “quotient” to calculate the “percent good factor.” And Assessor Greeley’s slides 8 – 10 make a *prima facie* case for an exponent of 0.69, which is the most crucial parameter in the calculation of the “percent good.” But the proposed amendments do not specify that the exponent under them will be 0.69, or any other fixed value (a higher number may be warranted) . They do not specify whether there would be specific exponents for individual fields or groups of fields, or whether “one size fits all” as Assessor Greeley’s Slides 8-10 suggest. They do not specify whether a given exponent is fixed or redetermined periodically, and if the latter, how often. Nor do they specify the data and methodology by which an exponent

would be calculated. Under the principles of Due Process and Equal Protection in the Alaska and federal constitutions, the Department cannot promulgate exponents willy-nilly however it wishes, without some standards to measure their reasonableness and their consistency with one another.

The exponent “scaling factor” should not be used in all circumstances. It represents the fact that a property has a value even though the property may be severely underutilized or idle, so using such a factor makes sense if the facility is severely underutilized. Using a scaling factor does not make sense in all cases for facilities and wells (if this exponent will be used for well valuations).

Reversal of decline back above 90% of historic peak production. It is unclear to us how the last sentence in proposed 15 AAC 56.100(a)(4) would operate. It says:

If new proven reserves reverse a production decline such that annual production is above ninety-percent of the historic peak production, or results in a new peak of production, depreciation will revert back to where it left off on the original one-percent per year schedule for the property as prescribed in (2)(A) of this subsection, until production decline.

In the initial case where new reserves reverse the decline and raise production back above 90% of the historical peak, it is not clear what the depreciation would “revert back” — suppose the original 1% a year lasted 6 years so the percent-good was 94%, would this reverting-back be to 94%, or to 93% because the new production would be in the 7th year? In the case of new reserves “result[ing] in a new peak of production,” would the resulting percent-good increase back to 100%, or to 94 or 93% (depending on the answer to the previous question), or to something else?

More fundamentally, the sudden jump in assessed value of the production property under this proposal not only defies the concept of depreciation over the life of an asset, but would also create a significant economic disincentive for producers to let new reserves raise production back above 90% of the historic peak production. We fail to see why it would be good policy for the State to encourage the potential throttling-back of new production (as this proposal would do) unless the new reserves are so large and commercially robust that they can overcome the significant economic handicap which this proposed amendment would create.

Purported relief for “extenuating circumstances” under 15 AAC 56.100(a)(5). This paragraph in the proposed regulations reads in pertinent part as follows:

(a) ... Value will be determined on a replacement cost less depreciation basis using the following methods:

* * * *

(5) the department will not deviate from the provisions set out in this section unless extenuating circumstances exist to justify deviation as determined by the department in its sole discretion. Extenuating circumstances may include reservoirs that immediately and significantly underperform resulting in abnormal

and excessive superadequacy of a property, and reservoirs that significantly overperform resulting in the facility constraint of a property. In addressing an extenuating circumstance the department may, in its sole discretion, modify the assessment methods contained in this section to account for the extenuating circumstance, or rely on other acceptable methods to assess the property. An extenuating circumstance does not require the department to modify the assessment method unless the assessment would be unequal, excessive, or improper without the modification. If seeking an adjustment to the assessment based on an extenuating circumstance the burden of proof will be on a taxpayer or municipality to come forward with clear and convincing evidence that an adjustment is necessary. It is not sufficient for the taxpayer or municipality merely to show that an extenuating circumstance exists. Instead, a taxpayer or municipality must provide information that demonstrates the department's replacement cost or depreciation estimates are materially insufficient. The department may leave an assessment calculation unadjusted even if the facts show an extenuating circumstance to exist. [emphasis added*]

It is worthwhile to review individually the underlined provisions being proposed, in order to see the progression of thought as the paragraph unfolds.

First, “the department will not deviate from [paragraphs (1) – (4)] unless extenuating circumstances exist to justify deviation as determined by the department in its sole discretion.” It would be much simpler to say, “the department will not deviate from [paragraphs (1) – (4)] unless it determines that extenuating circumstances justify the deviation.” The words “as determined by the department in its sole discretion” are unnecessary — who else would be making the determination? and in making it, wouldn't the department automatically be using its own discretion in deciding whether a “deviation” is “justif[ied]” without having to say anything in the regulation about its discretion?

Next, the regulation says extenuating circumstances “may include” reservoir underperformance and over-performance — which implies that other kinds of extenuating circumstances could also exist — even though, between the two of them, “under” and “over” performance covers the entire logical range of how a reservoir could perform differently from the performance expected when its production facilities were being designed and built. The choice of words here in the regulation leaves it open for the department to invent new extenuating circumstances based on something different from designed capacity of production facilities versus the volume of production they actually handle when the field first starts up. This possibility of inventing is expressly reinforced by the statement that “the department may, in its sole discretion, modify the assessment methods contained” in the other paragraphs of subsection (a). But the problem is, there is nothing in the proposal about the criteria for deciding how the “assessment methods” should be “modif[ied,]” nor anything about the procedures for taxpayers and municipalities to share their ideas about how and why the “assessment methods” should be “modif[ied.]” All there is, is the

* All of the text set out in the quotation is text being proposed for adoption. None of it is in the regulation now.

department's "sole discretion[.]"

Further, the department may — instead of "modify[ing] the assessment method [under the regulation]" — "rely on other acceptable methods to assess the property." "[A]acceptable" to whom? clearly, this means "acceptable" to the department "in its sole discretion[.]" Taken literally, this means that, whenever "extenuating circumstances exist" as the department "determines[.]" it can ignore all the written provisions in the regulations about determining the assessed value of production property and simply make up and apply willy-nilly anything it wants instead, no matter how different or inconsistent it may be with the provisions in paragraphs (1) – (4) that are being written into the regulation.

Yet, even in that case, "the burden of proof will be on a taxpayer or municipality" to show by "clear and convincing evidence that an adjustment [to the department's chosen] assessment method] is necessary." This "clear and convincing" standard is significantly more strict than showing that it is more likely than not that the department's "replacement cost or depreciation estimates" are "materially insufficient" — it requires showing that it is substantially more likely than not that they are "insufficient. This is not quite the "beyond a reasonable doubt" standard for criminal convictions, but it's pretty close. It imposes a burden of proof on the taxpayer or municipality that would be difficult to meet even if there were any identified criteria in the regulation for judging whether the department's "replacement cost or depreciation estimates" are "materially insufficient" and that "an adjustment [to them] is necessary." The lack of objective criteria about material insufficiency makes it virtually impossible make such a showing and meet this burden of proof.

Article I, section 7 of the Alaska Constitution provides:

No person shall be deprived of life, liberty, or property, without due process of law. The right of all persons to fair and just treatment in the course of legislative and executive investigations shall not be infringed.

The first sentence is the "Due Process" clause, while the second guarantees "fair and just treatment" at the hands of the government. Alaska case law has focused on the Due Process clause, and we are unaware of any decisions by the Alaska Supreme Court on the "fair and just treatment" clause.

With respect to Alaskan Due Process, municipalities are entitled to it the same as individuals are — *City of Homer v. State, Dep't of Natural Resources*, 566 P.2d 1314 (Alaska 1977) — so in this discussion we will not distinguish between situations where a municipality seeks to show that an adjustment to "replacement cost or depreciation estimates ... is necessary[.]" and where a taxpayer seeks it.

While no one has a vested right in any particular mode of procedure, Alaska Due Process does require that a substantial and efficient remedy remains available. *Arctic Structures, Inc. v. Wedmore*, 605 P.2d 426 (Alaska 1979). Proposed 15 AAC 56.100(a)(5) denies anything close to even a feasible "remedy" — much less one that is "substantial" and "efficient[.]" It is a target without anything defining what it is, nor how it can be achieved.

Yet proposed 15 AAC 56.100(a)(5) has one final, but stunning surprise — “even if the facts show an extenuating circumstance to exist” that “demonstrate[that] the department’s replacement cost or depreciation estimates are materially insufficient[, t]he department may leave [the assessment calculation unadjusted[.]” So even if a taxpayer or municipality — despite all of the usually insurmountable obstacles that the regulation puts in the way of making such a showing — actually succeeds in making the necessary showing, the department can ignore it.

This is not Due Process, nor is it “fair and just treatment in the course of [the department’s] executive investigation[.]” into the assessed value of any given production property.

[OPTIONAL PARAGRAPH depending on who, if anyone gets the cc’s of the Comments] Because of this, we have included Attorney General Lindemuth and Commissioner Fisher among the cc-recipients of these comments, and we respectfully ask them to read proposed 15 AAC 56.100(a)(5) and to make their views known about its legality and appropriateness.

ENDNOTES

¹ “Production property” means “taxable property used or committed by contract or other agreement for the production of gas or unrefined oil or in the operation or maintenance of facilities for the production of gas or unrefined oil[.]” *See* AS 43.56.060(d).

² AS 43.55.165(b)(1)(B) specifically includes “payments of or in lieu of property taxes” among the “direct costs” allowed as lease expenditures under that statute in the calculation of the taxable “net” value. This has been part of the production tax since it was first converted in 2006 from the former “ELF”-based tax on the gross value of production to a tax on the “net” value. *See* ch. 2, § 25, TSSLA 2006 at p. 27, lines 22-23 and 28-29.

³ SOURCE: State of Alaska, Department of Revenue, *Revenue Sources Book Spring 2017*, p. 11, “Table 4-4: ANS Oil & Gas Production Tax Data Summary” (column for FY 2018). The “ANS Wellhead” of \$44.21 a barrel in Table 4-4 is the “gross” value of the production, and the 4% minimum tax based on that “gross” value under AS 43.55.011(f) equals \$44.21 per barrel times 403,400 taxable barrels a day times 365 days times 4% — or \$260.4 million.

The regular 35% tax on “net” value equals —

- the gross value of \$44.21 per barrel times 403,400 taxable barrels a day times 365 days, or \$6,509,524,610

minus

- “Deductible North Slope Expenditures” of \$5,497,900,000 (using the higher of the two figures given for these expenditures in Table 4-4)

for a “net” value of \$1,011,624,610, times 35%, equals

- \$354,068,613 of “net” tax.

This is over \$90 million more than the \$260.4 million calculated in the first paragraph of this endnote for minimum tax under AS 43.55.011(f). If the lesser of the two figures given in Table 4-4 for “Deductible North Slope Expenditures” is used, the “net” value would go up from the figure above, and so would the amount of the 35% tax on “net” value.

⁴ In full, AS 43.56.060(d) provides:

(d) *The full and true value of taxable property used or committed by contract or other agreement for the production of gas or unrefined oil or in the operation or maintenance of facilities for the production of gas or unrefined oil is*

(1) on the construction commencement date the actual cost incurred or accrued with respect to the property as of the date of assessment;

(2) *determined* on each January 1 thereafter *on the basis of replacement cost less depreciation based on the economic life of proven reserves.* [emphasis added]

⁵ E.g., *BP Pipelines (Alaska) Inc. v. State*, 325 P.3d 478 (Alaska 2014).



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October 24, 2017

John Larsen, Audit Master
Audit Master, Department of Revenue
550 W. 7th Ave, Suite 1820
Anchorage, AK 99501

Re: Comments on proposed changes to 15 AAC 56.100 Production Property

Dear Mr. Larsen:

Please find our comments on the proposed regulation changes below.

Alaska Statute 43.56.060(c) states:

"The full and true value of taxable property used or committed by contract or other agreement for use in the exploration for gas or unrefined oil, or in the operation or maintenance of facilities for the exploration for gas or unrefined oil, is the **estimated price that the property would bring in an open market** and under the then prevailing market conditions in a sale between a willing seller and a willing buyer both conversant with the property and with prevailing general price levels."

Alaska Statute 43.56.060(d) states:

"The full and true value of taxable property used or committed by contract or other agreement for the production of gas or unrefined oil or in the operation or maintenance of facilities for the production of gas or unrefined oil is:

- (1) on the construction commencement date the actual cost incurred or accrued with respect to the property as of the date of assessment;
- (2) determined on each January 1 thereafter on the **basis of replacement cost less depreciation based on the economic life of proven reserves.**"

The proposed language for Title 15 Alaska Administrative Code 56.100(a)(3) states:

"Depreciation will be determined on January 1 of each calendar year based on the economic life of proven reserves using the following methods:

- (A) For production property serving one or more reservoirs that combined are in production ramp-up or plateau, depreciation[sic], will be determined by application of a **one-percent per year deduction to the replacement cost;**
- (B) For production property serving one or more reservoirs that combined are in production decline, depreciation will be determined through application of a percent good factor to the replacement cost. The percent good factor shall be the result of applying an exponent to a quotient. **The quotient will be determined by dividing the calendar year production from the reservoir or reservoirs for the year immediately preceding the assessment date by the calendar year historic peak production for the reservoirs the property serves.** The exponent shall scale the quotient to ensure the correct amount of depreciation is applied to the replacement cost for the property as of the assessment date;"

NEW DEPRECIATION METHOD

The proposed language states that depreciation will be determined based on the "economic life of proven reserves," but then it goes on to describe two methods that are in no way based on the "economic life of proven reserves."

Method 1 in section (A): Depreciating all properties at a flat one-percent of replacement per year seems to suggest the DOR believes all proven reserves in Alaska have identical economic lives at the time of first oil; which is clearly incorrect. This method is inappropriate and is in no way consistent with the statutes.

Method 2 in section (B) assesses property value by dividing “current production” by “historic peak production” scaled by an undefined exponent. The proposed method makes no attempt to estimate proven reserves or determine the amount of time it would take to produce those reserves. Estimating the “economic life of proven reserves” must involve estimating proven reserves and estimating the amount of time over which those reserves will be produced; any other method would defy the legislative statute. To demonstrate the degree to which the proposed method is flawed: imagine a scenario in which a field is in decline for a few years then plateaus, producing the same number of barrels two years in a row. The proposed method would result in zero depreciation being recognized even though the “economic life of proven reserves” has clearly decreased as an entire year of production has occurred and a year of time has passed. Such a scenario should not be possible under an adequate assessment method. Now imagine this same scenario, except instead of plateauing, production decreases by 10 barrels for the year. This would result in a miniscule amount of depreciation being recognized for the year; which would likewise be inappropriate for the same reasons. This method provides less depreciation for fields with less steep decline curves, which is arbitrary and unreasonable.

USE VALUE STANDARD

The DOR has proposed changes to 15 AAC 56.100(a) whereby property will no longer be valued on the basis of “replacement cost less depreciation” and will instead be value based on the “use value standard.” This change serves to removing language that is straight from the statute and replacing it with a standard that has no statutory or case law support for production property as defined in AS 43.56.060(d).

ALLOWANCE FOR EXTENUATING CIRCUMSTANCES

Proposed 15 AAC 56.100(a)(5) states:

“An extenuating circumstance does not require the department to modify the assessment method unless the assessment would be unequal, excessive, or improper without modification.”

“A Taxpayer or municipality must provide information that demonstrates the department’s replacement cost or depreciation estimates are materially insufficient.”

“The department may leave an assessment calculation unadjusted even if the facts show an extenuating circumstance to exist.”

We believe the first two sentences are supported by Alaska Statute 43.56.060(d) and are appropriate inclusions to the regulation. However, we disagree with the proposed inclusion of the third sentence as it contradicts and completely negates the earlier language. If the DOR’s assessment method produces a valuation that is materially inconsistent with the property’s “full and true value” then the statutes *require* an adjustment be made.

UNFAIR AND HARMFUL

The proposed valuation method will have a devastating impact on all ongoing and future projects in Alaska. As an example, Caelus’ 2017 production property valuation would be over \$80,000,000 higher under the new method compared to the old method. Under AS 43.56 tax is calculated as 2% of assessed property value, which means our gross property tax would have been over **\$1,600,000 higher** under the new method versus the old method. This would certainly have a material impact on our business. The proposed method would harm the economics of possible future projects and erode investor trust in the State by demonstrating that the DOR is willing to bypass the legislature and implement punishing changes without proper statutory support. We ask the DOR to respect the laws put in place by the legislature and issue regulations that are in line with those laws.

Respectfully,

A handwritten signature in blue ink, appearing to read 'mabyerly', written in a cursive style.

Marc A. Byerly

Vice President and Controller

Attachment:

Letter date July 28, 2017 Re: Depreciation workshop – Alaska Department of Revenue Tax Division Property Tax Workshop – AS 43.56.060(d)-(3) Depreciation - July 11, 2017



HAND DELIVERED

Marie P. Evans
Sr. Counsel Taxation

RECEIVED

OCT 24 2017

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October 24, 2017

Mr. John Larsen
Audit Master, Department of Revenue
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Anchorage, AK 99501

Re: Department of Revenue, Notice of Proposed Changes for
Oil & Gas Production Property, AS 43.56.060(d), 15 AAC 56.100
Dated September 18, 2017

Dear Mr. Larsen:

This letter responds to the Department of Revenue's ("Department") Notice of Proposed Changes ("Notice") in the regulations affecting the oil and property tax assessment of property used in the production of oil or gas ("Production Property"). This Notice followed the Department's scoping workshop on July 11, 2017 and responses to the Department's request for written comments. Both the taxpayers and Municipal representatives provided written comments to the Department that counseled against adopting the now proposed regulations. While the taxpayers and the Municipalities differ in their underlying reasons, both recommended against the proposed regulations for Production Property.

The Notice provides two opportunities to comment on the proposed changes to the Production Property tax regulation 15 AAC 56.100: (1) submit questions at least 10 days prior to the end of the public comment period, October 24, 2017; and (2) written comments by 4pm, Tuesday, October 24, 2017. ConocoPhillips Alaska timely submitted questions, reviewed the answers provided yesterday and encloses the following comments.

Proposed Regulation 15 AAC 56.100 is Inconsistent with the Statute & Lacks Reasonable Relation to the Statutory Objective of Assessing the Taxable Property & Deriving the Proper Amount of Tax

Alaska Statute 43.56.060(a) provides that the Department is responsible for assessment of oil and gas property.¹ Specifically, the Department must assess the property at its “full and true value as of January 1 of the assessment year.”² The next subsection of AS 43.56.060 specifies the type of oil and gas property being assessed. At subsection (d) the statute states:

(d) The **full and true value** of taxable property used or committed by contract or other agreement for the production of gas or unrefined oil or in the operation or maintenance of facilities for the production of gas or unrefined oil is:

(1) **on the construction commencement date the actual cost incurred or accrued** with respect to the property as of the date of assessment;

(2) **determined on each January 1 thereafter on the basis of replacement cost less depreciation based on the economic life of proven reserves.**

(Emphasis Added.)

Analogous with Alaska Statute 43.56.060(a), AS 43.56.060(d) instructs the Department to assess the “full and true value of taxable property,” the taxable property being Production Property. Yet, the proposed regulation departs from “full and true value” or defining “full and true value” and inserts “use value standard.” Regulation 15 AAC 56.100(a) is proposed to be amended to read, in part:

Property used or committed by agreement for use in the production of gas or unrefined oil, or in the operation or maintenance of facilities for the production of gas or unrefined oil will be valued on a use value standard [REPLACEMENT COST LESS DEPRECIATION BASIS]. Value will be determined on a replacement cost less depreciation basis using the following methods: [DEPRECIATION WILL BE BASED UPON THE ECONOMIC LIFE OF PROVEN RESERVES, WITH DUE CONSIDERTION GIVEN TO THE ELAPSED LIFE OF THE FACILITIES.]

During the July 11, 2017 workshop the Department referenced the litigation and Anchorage Superior Court decision pertaining to transportation property for the “use value standard,” however, the litigation and decision did not pertain to or involve AS 43.56.060(d). Even though the Department expressed that it assesses the “full and true value” with a use value standard

¹ AS 43.56.060(a) states:

The department shall assess property for the tax levied under AS 43.56.010(b) and AS 29.45.080 on property used or committed by contract or other agreement for use for the pipeline transportation of gas or unrefined oil or for the production of gas or unrefined oil at its full and true value as of January 1 of the assessment year.

² *Id.*

pursuant to AS 43.56.010(a),³ it remains unclear how the Department bridges from “full and true value” to “use value standard” and how the Department defines “use value standard.” Absent clarity, confusion and differing opinions will lead to disagreement among interested parties and possibly litigation.

To further confound, the proposed regulation contravenes that statute by departing from the requirement that “depreciation [is] based on the economic life of proven reserves” on multiple fronts. First, as noted above, AS 43.55.060(d) starts assessing Production Property upon commencement of construction using actual or accrued costs, then the following years the assessment is “...on the **basis of replacement cost less depreciation based on the economic life of proven reserves.**” Emphasis Added. The proposed regulation at 15 AAC 56.100(a)(2) improperly delays any contemplation of depreciation until after the “commencement of regular production.”⁴

Second, the proposed regulation sets forth two “methods” to calculate the “economic life of proven reserves” that fail to consider proven reserves in the actual calculation. At 15 AAC 56.100(a)(3)

...depreciation will be determined on January 1 of each calendar year based on the economic life of proven reserves using the following methods:

- (A) for production property serving one or more reservoirs that combined are in production ramp-up or plateau, depreciation will be determined by application of a one-percent per year deduction to the replacement cost;
- (B) for production property serving one or more reservoirs that combined are in production decline, depreciation will be determined through application of a percent good factor to the replacement cost. The percent good factor shall be the result of applying an exponent to a quotient. [...] The exponent shall scale the quotient to ensure the correct amount of depreciation is applied to the replacement cost for the property as of the assessment date;

The proposed regulation’s use of one-percent in “ramp-up” or “plateau” for depreciation has no relation to “the economic life of proven reserves.” Nor does the proposed regulation properly reflect any of the types or causes of depreciation recognized by generally accepted

³ See Attachment A - Department of Revenue Responses to Questions Proposed 15 AAC 56.100, Question.

⁴ “Some depreciation occurs between the date when the improvement begins to contribute to value and the date of the opinion of value; wear and tear can take their toll even during construction, which is [on the North Slope of Alaska] usually a long process.” The Appraisal of Real Estate, Twelfth Edition, Appraisal Institute (2001), p. 388.

appraisal concepts of physical, functional and economic obsolescence.⁵ For example, assume a \$500 million facility has processed the same amount of production for 5 years, then according to the proposed regulation this is likely a “plateau.” It appears the only depreciation allowed would be 1% times \$500 million, a math calculation that fails to take into consideration anything about the proven reserves which at a minimum decreased considering five years of volumes were removed from the ground.

If the Department desires to promulgate a regulation, then it should consider a discussion of the proper calculation of physical deterioration measured in terms of units like the economic life of proven reserves as described in Valuing Machinery, the text recognized by Appraisers as the authoritative guide to appraisal of machinery like production property, which provides:

“Physical deterioration is often estimated as a percentage; a new property has 0% physical deterioration, while a property that is completely exhausted [no remaining economic life of proven reserves] and has no scrap value has 100% physical deterioration, with all other properties having different degrees of deterioration falling between these two extremes. Theoretically, physical deterioration can be measured objectively. A machine will produce x number of parts in its physical life. Assuming adequate statistics are kept ... then a simple ratio of past production to the expected production would result in an objective measure of physical deterioration.”⁶

The Department explains that it derived the one-percent by looking at “several reservoir scenarios using different decline rates and sampling various depreciation rates to find the incremental depreciation rates at the point in time that best matched the performance of the reservoir over its life.”⁷ We recommend the Department make public its scenarios and its samples so that the taxpayers may understand and compare to their individual properties.

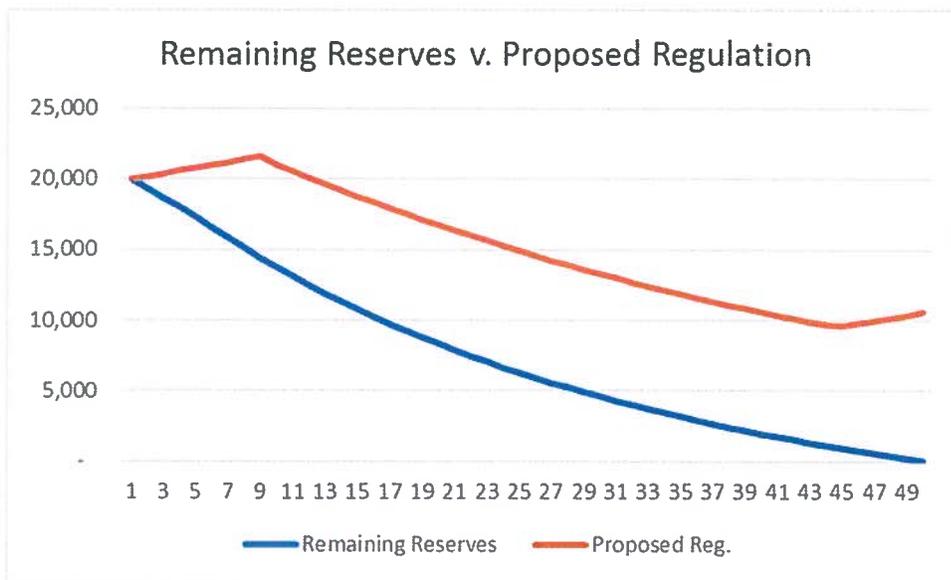
At proposed 15 AAC 56.100(a)(3)(B) depreciation is calculated through “a percent good factor” which is another math calculation only applied in an assessment year “when production for the calendar year preceding the assessment date is ninety-percent or less of the historic peak production for the reservoirs served by the property.” So, the proposed depreciation is a math calculation based not on what remains viable to remove from the ground, but what volume has been produced and the volume sold, and whether the production dropped enough to allow the property’s value to depreciate.

⁵ “The three types or causes of appraisal depreciation traditionally recognized by appraisers are physical deterioration, functional obsolescence, and economic obsolescence.” The Fundamentals of Appraising Machinery and Technical Assets, Third Edition, American Society of Appraisers, (2011), p. 58.

⁶ The Fundamentals of Appraising Machinery and Technical Assets, Third Edition, American Society of Appraisers, (2011), Page 59.

⁷ See Attachment A – Department of Revenue Responses to Questions Proposed 15 AAC 56.100, p. 2, Question 4.

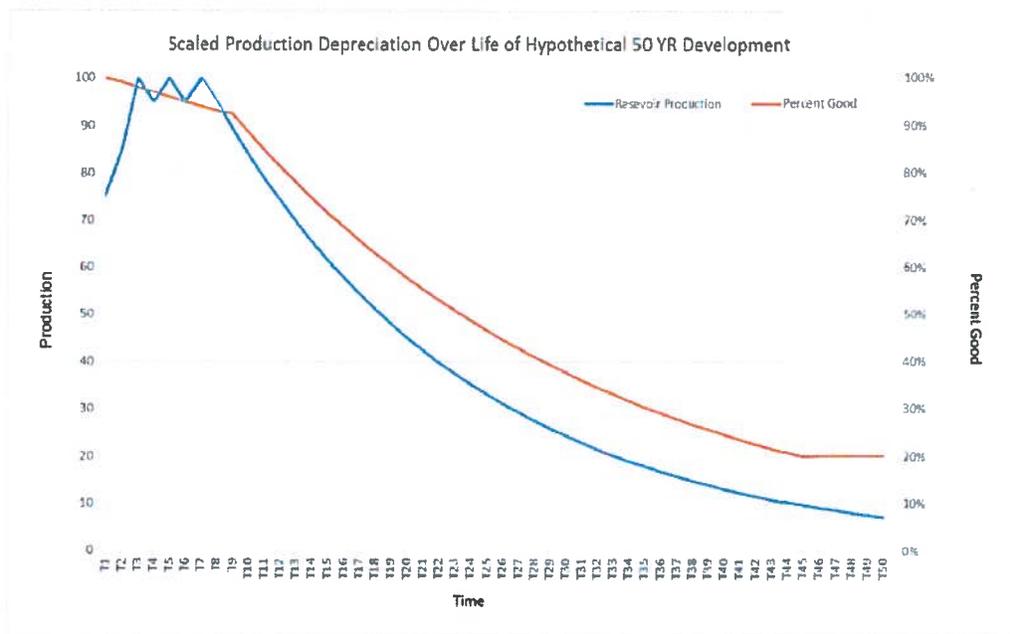
If a replica of the Department’s blue line (Reservoir Production) on its Slide 12⁸ is recreated below, and then a “percent good factor” calculated for depreciation of an asset with peak historical production of 120,000 barrels per day, 2% inflation, an exponent of .69 (per Department Slide 8),⁹ the asset increases in value for the first 9 years while the proven reserves decrease. The depreciation in the proposed regulation fails to reflect the proven reserve curve and under-depreciates the asset.



In the Department’s Slide 12 (Attachment C and pasted below) a similar result is noted. The orange “percent good” never converges with the blue line. In fact, at the end of the asset’s life

⁸ See Attachment C – Department’s Scaled Production Methodology Slide 12.

⁹ See Attachment D - Department’s Current Deprecation Methodology Slide 8.



the value will increase.

The proposed regulation at 15 AAC 56.100(a)(4) continues to depart from the statute and recognized appraisal theory by creating a floor for depreciation stating that depreciation shall not exceed 80% or 90% of the replacement cost depending on the circumstances. By creating this floor for assessed value the economic life of proven reserves the statute is ignored.

Both depreciation methods proposed in the new regulation at 15 AAC 56.100(a)(3)(A) and (B), and the depreciation floor at 15 AAC 56.100(a)(4) contravene the statutory requirement to measure depreciation based on the economic life of proven reserves. The Department's "one-percent" calculation will not result in the proper assessment and correct amount of tax on an asset and it is not what ConocoPhillips considers normal depletion of proven reserves. While we understand the Department's attempt to "simplify" the calculation of depreciation,¹⁰ we recommend against adopting this regulation and encourage the Department to apply a depreciation method supported by depletion of oil and gas fields and aligned with the statute and legislative intent.¹¹

¹⁰ The one-percent methodology proposed also ignores "inutility" generally recognized by the Appraisal community and defined as: "Whenever the operating level of a plant or an asset is significantly less than its rated or design capability, and the condition is expected to exist for some time, the asset is less valuable than it would otherwise be. Such a penalty for inutility can be a measure of the loss in value from this form of economic obsolescence." The Fundamentals of Appraising Machinery and Technical Assets, Third Edition, American Society of Appraisers, (2011), p. 79. Recognized as well by the Alaska State Assessment Review Board, most recently in 2016 with regard to the Nikaitchuq production facilities: IMO ENI Operating Company, Oil and Gas Property Tax (AS 43.56) 2012-2016 Assessment Years OAH No. 16-0424-TAX.

¹¹ "Regardless of the method applied, the appraiser must ensure that the final estimate of depreciation reflects the loss in value from all causes [physical deterioration, functional obsolescence, and external obsolescence] and that

Proposed Regulation 15 AAC 56.100(a)(2) Defeats the Statutory Purpose of Assessing the Taxable Property

At 15 AAC 56.100(a)(2) the proposed regulation states:

after the commencement of regular production replacement [REPLACEMENT] cost will be calculated on January 1 of each calendar year by the use of accepted appraisal techniques or other acceptable methods and shall reflect the full current cost of a modern replacement for the production property physically present and installed as of the assessment date, and;

The proposed language confuses different property tax assessment concepts – replacement cost and reproduction cost. A “modern replacement” for “production property physical present and installed as of the assessment date”¹² presumes that the “modern” replacement would be the same as the existing property.¹³ Oil and gas reserves are a declining resource therefore in very few instances will a “modern replacement” ever be the same as the existing property. The very tenet in using any cost approach is that a prudent buyer would value the property at no more than the cost of otherwise replacing the property on the valuation date.¹⁴ Conceptually, valuation under any replacement methodology must take into account assessment date market values and costs, technological change,¹⁵ modified processes and logistical changes over time and not simply look back to original Production Property.

The Department’s response to ConocoPhillips’ Question 3 reflects that it will always look back to the original Production Property because “a modern replacement would theoretically differ

no form of depreciation has been considered more than once. Thus a replacement cost figure is usually lower and may provide a better indication of the existing structures contribution to value.” *The Appraisal of Real Estate*, Twelfth Edition, Appraisal Institute (2001), p. 383.

¹² Quoting Bonbright, *The Valuation of Property*, Michie Company (1965): “Most physical properties are not replaced by properties of the same size, design, and materials. They are replaced by materially different properties of a more modern type, better designed to meet the owner’s present needs...” *Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets*, Third Edition, American Society of Appraisers, (2011), p. 41.

¹³ “Replacement structures usually cost less than identical structures (i.e. reproductions) because they are constructed with materials and techniques that are more readily available and less expensive in the current market and because correcting deficiencies may result in lower costs.” *The Appraisal of Real Estate*, Twelfth Edition, Appraisal Institute (2001), p. 383.

¹⁴ “The principle of substitution is basic to the cost approach. This principle affirms that a prudent buyer would pay no more for a property than the cost to acquire a similar site and construct improvements of equivalent desirability and utility without undue delay.” *The Appraisal of Real Estate*, Twelfth Edition, Appraisal Institute (2001), p. 350.

¹⁵ “Functional considerations – i.e. the rate at which construction technology ... change. These factors can render an improvement functionally obsolete, regardless of its age and/or condition.” *The Appraisal of Real Estate*, Twelfth Edition, Appraisal Institute (2001), p. 386.

from the actual subject property being assessed” and “there are no readily available alternative properties or practical options to substitute for the existing property...”¹⁶ However, this does not make sense if the cost approach is being used in the regulation. The cost approach uses the principle of substitution as its basis.¹⁷ Depreciation is measuring the loss in value incurred by the subject property at the lien date compared with a hypothetical new property.¹⁸ We recommend that this proposed language be re-worded, so the concept of replacement and reproduction are not conflated and do not cause confusion.

Proposed Regulation 15 AAC 56.100(a)(5) Lacks Clarification & Appears to Conflict with the Statutory Mandate for Proper Assessments

The language in proposed regulation 15 AAC 56.100(a)(5) conflicts with itself and the statute. It states, in relevant part, “[a]n extenuating circumstance does not require the department to modify the assessment method unless the assessment would be unequal, excessive, or improper without the modification,” but then the last proposed sentence says the “department may leave an assessment calculation unadjusted even if the facts show an extenuating circumstance to exist.” The Department’s response to ConocoPhillips’ Question 7 provides a much better understanding of the Department’s intention and we recommend removing the last four sentences of the proposed regulation.

Proposed Definitions Lack Clarity

At 15 AAC 56.100(c) the Department proposed the definition of “production” as “...the sum of all regular production produced and sold from reservoirs served by the production property plus the amount of otherwise commercial oil or gas produced that is used in operation of those leases or other leases in drilling for or producing oil or gas, including fuel and reservoir recovery uses.” The definition of “production” is problematic:

(1) The proposed definition utilized information not available to the public or the Operator responsible for filing a property tax rendition where production is the “sum of all regular production produced and sold...” The volumes produced do not equate to the volumes sold. The working interest owners of each Unit take their production in-kind and sell their own production therefore no sales information is available (nor should it be due anti-trust and other related laws) to the Operator. The Department’s response to Question 9 recognizes public

¹⁶ See Attachment A.

¹⁷ The Appraisal of Real Estate, Thirteenth Edition, p. 380.

¹⁸ “Depreciation is the loss in value, from all causes of property having a limited economic life. ... Assessors estimate depreciation (loss in value) by estimating the amount of value loss incurred by the subject property in its present condition as compared with the value of the property if it were new. They subtract depreciation from from the estimated improvement cost new to obtain the present worth of an improvement.” Property Assessment Valuation, Second Edition, International Association of Assessing Officers, (1996) p. 153.

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sources exist, like the Alaska Oil & Gas Conservation Commission website, for volumes and we recommend the regulation's language is modified to reflect such public sources.

(2) The proposed definition also uses the qualification of "commercial oil or gas produced that is used in operation of those leases." Whether another working interest owner uses "commercial oil or gas" in their operations is unknown to the Operator and whether every working interest owner defines "commercial" the same is also unknown. We recommend the Department remove the adjective "commercial" or, at a minimum, explain why and where to obtain such volume information.

The definition of "production decline," as proposed, occurs when "production for the calendar year preceding the assessment date is ninety-percent or less of the historic peak production for the reservoirs served by the property." With new fields, we are unable to discern how the Department anticipates calculating the "historic peak production." While the Department's response to ConocoPhillips' Question 10 explains, "[t]he reservoir's own performance and production history will indicate when it has decreased 10% or more from historic peak to enter the post decline phase depreciation methodology," it remains vague, absent the privilege of hindsight whether the "historic peak production" is a one-time evaluation or reconsidered every year. We recommend the regulations provide examples for a new field.

After reviewing the proposed regulations and the Department's answers to our questions, and for the reasons above, we recommend against adoption of the proposed regulations.

Sincerely,



Marie P. Evans

Question #1: The proposed regulation change for 15 AAC 56.100(a) removes the "replacement cost less depreciation basis" and replaces it with "use value standard." Since the authorizing statute AS 43.56.060(d) does not use the term "use value standard" and we could not find case law referring to or mentioning the term or phrase "use value standard" for AS 43.56.060(d) property, is the Department interpreting the "use value standard" to equate to "full and true value" as it is defined at AS 43.56.060(d)?

1. Department response: The replacement cost less depreciation basis remains in the currently proposed regulation amendment. The Department assesses the full and true value of oil and gas property in Alaska pursuant to AS 43.56 under a use value standard under the provisions of AS 43.56.010(a).

In its public workshop the Department previously discussed in detail the facts and circumstances pertaining to oil and gas production property in Alaska that necessitates the need to assess the full and true value under a use value standard. The two principal factors being, 1) the limited market place, and 2) the special purpose nature of the property.

Question 2: If the answer to Question 1 is negative, then how does a taxpayer reconcile that the assessment statute, AS 43.56.100(d) assesses the full and true value and the regulation is using the "use value standard?"

2. Department response: N/A

Question 3: At 15 AAC 56.100(a)(2) the proposed language states:

after the commencement of regular production replacement [REPLACEMENT] cost will be calculated on January 1 of each calendar year by the use of accepted appraisal techniques or other acceptable methods and shall reflect the full current cost of a modern replacement for the production property physically present and installed as of the assessment date, and;

For property that is not brand new or relatively new, how is it possible to have "a modern replacement" for "the production property physically present and installed" on the assessment date? For property that has aged that is "physically present and installed" isn't it likely "a modern replacement" will differ?

3. Department response: Typically trended original cost is relied on to estimate the cost of a modern replacement at current tax year price levels. It is true that for very old property care must be taken to ensure replacement cost is estimated accurately, and in such endeavors, independent cost studies may be relied on.

In administering AS 43.56 assessments under a use value standard, arguments that a modern replacement would theoretically differ from the actual subject property being assessed are without merit. The appraisal assignment under AS 43.56 is to assess the full and true value of the subject property, which is special purpose property and located in a limited market. As such, there are no readily available alternative properties or practical options to substitute for the existing property that match differing theories. Further, the actual subject property is expected to be in use over the economic life of proven reserves produced from the reservoir it is dedicated to and serves.

$$\left[\left(\frac{C_2}{C_1} \right) = \left(\frac{Q_2}{Q_1} \right)^x \right]$$

Question 7: Proposed regulation 15 AAC 56.100(a)(4) creates a floor for depreciation by stating the depreciation shall not exceed 80% or 90% of the replacement cost depending on the circumstances. By creating this assessment floor for property is this regulation conflicting with the statutory requirement where that the full and true value is arrived at using "the basis of replacement cost less depreciation based on the economic life of proven reserves?" Couldn't depreciation reduce the assessed value below the proposed floors?

7. Department response: Depreciation under the cost approach nearly always stops at a minimum base cost if the property is still physically in place, never reaching zero. For operating properties an eighty-percent depreciation floor is common. For shut-in properties anticipated to be dismantled, removed, and the site restored, a ninety-percent depreciation floor is normal.

Here, at the 80% depreciation floor, the remaining cost being assessed is required to reflect the full and true value of a property that can sustain production of the remaining proven reserves for the entire range of production occurring from that point in a property's economic life until shut-in. This is due in large part to economies of scale, and the reality that a minimum base cost is required to sustain a low end range of production.

At shut-in and the 90% depreciation floor, the remaining cost being assessed reflects the full and true value of a property that's use was dedicated to serving the proven reserves of a reservoir(s) and the value remaining in the property at the point of reservoir shut-in. The full and true value at shut-in also in-part reflects an Alaska based reality that a shut-in property may be put back in service at some point in the future.

It is also important to note that property tax tenets support the widely used application of floor depreciation in assessing programs. A fundamental purpose of a property tax is to ensure that local communities and governments are supported for the impacts associated with the presence of physical property (need for associated public infrastructure, increased populations and associated services, etc.). These impacts remain while the physical property exists. Therefore, allowing property to depreciate closer to zero while it is in operation or is still physically in place would be improper.

Question 8: Has the Department considered the language in proposed regulation 15 AAC 56.100(a)(5) may conflict with itself and the statute? The language states that "[a]n extenuating circumstance does not require the department to modify the assessment method unless the assessment would be unequal, excessive, or improper without the modification," but then the last proposed sentence says the

- Why would it be appropriate to ignore a decrease in value simply because it does not meet this threshold?
- 10. Department response: The property serving a new reservoir would initially be assessed using the pre-decline phase depreciation methodology. The reservoir's own performance and production history will indicate when it has decreased 10% or more from historic peak to enter the post decline phase depreciation methodology.

The depreciation methodology in the proposed regulation amendment is able to measure decreases in value when they occur.

NOTE: The Department of Revenue has made grammatical edits to some questions.

DOR Current Depreciation Methodology

AS 43.56.060(d)-(e)

➤ Scaled Production Methodology

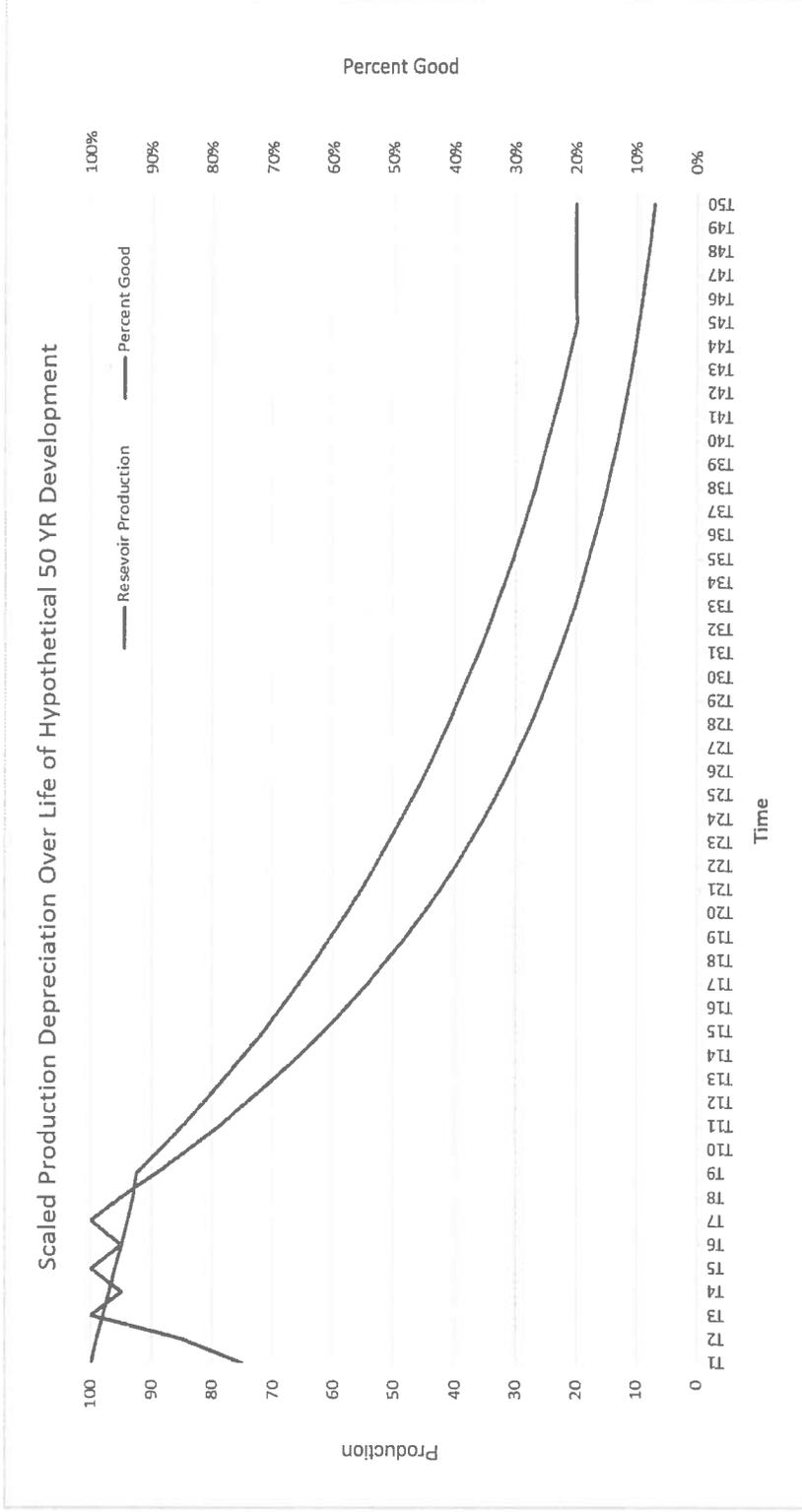
- Depreciation measured directly from the reservoir the property serves in one of two ways (depending on reservoir phase):
 1. Pre-Divide Phase (ramp up or plateau production)
 - One percent depreciation per year

OR:

2. Decline Phase (10% or more off peak or plateau production)
 - Scaled production methodology:
 - $(\text{Reservoir Current Production} / \text{Reservoir Historic Peak Production}) \wedge \text{SF}$
 - Current production = previous CY production
 - Floor depreciation 20% for operating production/pipeline property

Scaled Production Methodology

Expected Depreciation Over the Life of a Hypothetical 50yr Development



* Hypothetical scenario based on a two year ramp up phase, a five year plateau production phase, and then a six percent annual decline.

DOR Current Depreciation Methodology

Hypothetical Numerical Example

➤ Scaled Production Methodology

- Production facility built and reservoir peak oil production reached in a few years at 50,000 barrels of oil per day
- After fifteen years reservoir is producing 20,000 barrels of oil per day
- Factor applied to the production facility RCN for the fifteenth year to calculate depreciation on a percent good basis:

$$\left[\frac{20,000}{50,000} \right] ^ .69 = 53.14\%$$

- Percent good is the inverse of depreciation, where here 53.14% good equals 46.86% depreciation (100% - 53.14% = 46.86%)