

**Regulatory Impact Analysis of Proposed Rules 15A NCAC 02S .0101, .0102, .0201, .0202, .0301, .0501, .0502, .0503, .0506, .0507, .0508, .0509 for readoption**

**Name of Commission:** Environmental Management Commission

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**Impact Summary:**

State Government:	Yes
Local Government:	No
Substantial Impact:	No
Private Sector:	Yes

**Authority:** G.S. 143-215.104

**Necessity:** These rules changes are considered necessary to incorporate technical changes, and to make the rules consistent with other Department of Environmental Quality (DEQ) risk-based remediation programs; and readoption of the 15A NCAC 02S rules is required as part of the mandatory Periodic Rule Review procedures of G.S. 150B-21.3A.

## I. Summary

The purpose of this document is to provide a regulatory impact analysis addressing the fiscal impacts associated with readoption and amendments to rules in 15A NCAC 02S Sections .0100, General Considerations, .0200, Minimum Management Practices, .0300, Petitions for Certification, .0400, Assessment Agreements, and .0500, Risk-Based Corrective Action.

A fiscal and regulatory impact analysis is required for readoption if all the following criteria apply:

- The rule is readopted with substantive change;
- The change results in state, local or substantial impact; and
- A rule in the package proposed to be adopted together creates a net cost on any part of the regulated community.

G.S. 150B-21.3A(d)(2) states that “If a rule is readopted without substantive change or the rule is amended to impose a less stringent burden on regulated persons, the agency is not required to prepare a fiscal note as provided by G.S. 150B-21.4.”

G.S. 150B-21.4(d) states that “If an agency proposes the repeal of an existing rule, the agency is not required to prepare a fiscal note on the proposed rule change as provided by this section.”

Rule changes are necessary to reflect the Department of Environment and Natural Resources’ name change to the Department of Environmental Quality (DEQ), and to remove an outdated address for the Division of Waste Management. An agency-requested pre-review by Rule Review Commission staff attorneys resulted in several additional recommended technical changes that are included in the proposed rules. More substantive proposed rule changes include (i) clarifying stability monitoring language in the No Further Action Criteria; and (ii) updating the rules to follow risk-based standards used by other DEQ risk-based cleanup programs, which will have the effect of amending the upper end of the allowable cumulative cancer risk range from 1 in 100,000 to 1 in 10,000. This amendment to the allowable cumulative cancer risk range is the only rule change projected to have a cost impact.

It is acknowledged that amending the cancer risk range to be consistent with DEQ’s risk-based programs may result in an increased excess cancer risk for a population exposed to remaining contamination. Based on the conservative nature of risk evaluation assumptions, the very limited potential for exposure as described below, and the disproportionately large percentage of background cancer incidents, the impact of the increased risk is so small that the Program has concluded that it is not quantifiable.

Amending the risk range to align with other DEQ risk-based cleanup programs will allow the DSCA Program to save an estimated **\$14,000 to \$38,000/year** in monitoring and remediation costs. For DSCA sites where these savings can be realized, petitioners would save **\$200 to \$580** in annual co-payments. However, the estimated reduction in petitioner co-payments means a loss of that revenue for the Program, and consequently those impacts will offset one another. The total impact of the proposed changes to 15A NCAC 02S is estimated at a present value savings over the next 20 years of **\$256,000 to \$419,000**.

Based on this analysis, the amendments proposed for the readoption do not rise to the level of substantial impact.

## **II. Introduction and Purpose of Rule Change(s)**

The Dry-cleaning Solvent Cleanup Act (DSCA) of 1997 and its amendments created a fund for assessment and cleanup of dry-cleaning solvent environmental contamination at dry-cleaning and wholesale distribution facilities and authorized the program to develop and enforce rules relating to the prevention of dry-cleaning solvent releases at operating facilities. The DSCA Program is tasked with using a risk-based approach to clean up dry-cleaning solvent contamination at dry-cleaners and wholesale solvent distribution sites, and protecting human health and the environment by preventing future dry-cleaning solvent contamination. The program hires and oversees state-lead environmental firms to assess and remediate DSCA sites. Receipts from taxes on regulated dry-cleaning solvents and from the dry-cleaning sales and use tax provide approximately \$8,000,000 to the DSCA Fund annually. Assessment and remediation

expenditures account for approximately \$6,500,000 per year, and administrative costs account for approximately \$1,500,000 each year.

Rule changes are necessary to reflect the Department of Environment and Natural Resources' name change to the Department of Environmental Quality (DEQ), and to remove an outdated address for the Division of Waste Management. An agency-requested pre-review by Rule Review Commission staff attorneys resulted in several additional recommended technical changes that are included in the proposed rules. More substantive proposed rule changes include (i) clarifying plume stability criteria in the No Further Action Criteria; and (ii) updating the rules to follow risk-based standards used by other DEQ risk-based cleanup programs, which will have the effect of amending the upper end of the allowable cumulative cancer risk range from 1 in 100,000 to 1 in 10,000.

The rule change projected to have a cost impact is amending the upper end of the allowable cumulative cancer risk range from 1 in 100,000 to 1 in 10,000. The following analysis describes the estimated benefits and costs of amending the cancer risk range to be consistent with the NC DEQ's risk-based remediation programs.

### **III. Benefits**

Department name and address changes, clarifying language, and amending the individual excess lifetime cancer risk (IELCR) threshold specified in the existing rules will incur no additional costs for local governments, state entities, the regulated community, or the public.

However, amending the individual excess lifetime cancer risk (IELCR) threshold specified in the existing rules to be consistent with the IELCR threshold used in other DEQ risk-based cleanup programs is anticipated to realize a potential minor annual savings for the DSCA Fund, and a potential nominal savings for petitioners with sites in the DSCA cleanup program.

#### ***Background***

Risk-based remediation decisions are based on evaluating risks associated with exposure to chemicals in the environment via pathways that may include dermal contact, inhalation, and ingestion of contaminated soil, water, and/or air. Chemicals may induce non-carcinogenic health effects or carcinogenic health effects, or both. The suggested rule change effectively amends only the carcinogenic risk threshold, and does not alter the non-carcinogenic thresholds established in the existing rules. This distinction is necessary because the risks posed by dry-cleaning solvent contamination are related to the type(s) of dry-cleaning solvents that were used. Dry-cleaning contamination eligible for cleanup under DSCA must be associated with a release of petroleum solvents, chlorinated hydrocarbon solvents, or both. Risk assessments at more than a hundred DSCA sites have shown that cleanup decisions at chlorinated hydrocarbon solvent sites are driven by non-carcinogenic risks, and at petroleum solvent sites by carcinogenic risks. Consequently, this analysis uses the universe of DSCA

petroleum solvent sites to estimate cost impacts resulting from amending the cancer risk threshold.

Cancer risk is typically defined as an “increase over background in an individual’s probability of getting cancer over a lifetime due to exposure to a chemical.” For carcinogenic chemicals, cleanup levels are established at concentrations that correspond to an individual excess lifetime cancer risk (or IELCR) ranging from 1 in 1,000,000 (or  $1 \times 10^{-6}$ ), which is considered the most conservative, up to an IELCR of 1 in 10,000 (or  $1 \times 10^{-4}$ ), which is considered the acceptable upper range by EPA and NC DEQ’s risk-based remediation programs. Under existing rules, the upper IELCR value acceptable for DSCA sites is established at 1 in 100,000 (or  $1 \times 10^{-5}$ ) making it inconsistent with the other programs.

The proposed adjustment of the acceptable IELCR value from 1 in 100,000 to 1 in 10,000 will result in a potential minor cost savings to the DSCA Fund and to petitioners for certain sites that will be affected by the proposed change as explained below.

### ***Explanation of Estimated Benefits – DSCA Savings***

Amending the IELCR threshold as proposed will correspond to a slight lessening of the cleanup standards, and thus a reduction in the costs spent by DSCA.

To estimate cost savings, the program evaluated the strategies used to manage the existing DSCA petroleum solvent sites that exceed the IELCR of 1 in 100,000 threshold, and estimated the number on new sites that will enter the program.

#### **Existing Petroleum Solvent Sites**

At the time of this analysis, 406 contaminated dry-cleaning solvent sites have been certified in DSCA, and of these, only five are potentially affected by amending the acceptable IECLR threshold from 1 in 100,000 to 1 in 10,000.

For sites where the IELCR is between 1 in 100,000 and 1 in 10,000, one or both of the following strategies are used to manage these sites. These same strategies are projected to be used on new sites entering the program in the future should the current IECLR remain at 1 in 100,000

1. Continue groundwater monitoring on a biennial frequency until petroleum solvent contaminants in soil naturally degrade to concentrations that meet the IELCR of 1 in 100,000.

Estimated monitoring costs:	\$10,000 per event
Frequency:	Biennial – every other year
Estimated annual costs per site:	\$5,000
Assumed number of sites affected:	5
Estimated total annual costs:	<b>\$25,000</b>
Duration:	5 – 20 years

Present value of lifetime costs:        **\$103,000 – \$265,000**

Assumptions:

- Monitoring costs include sampling 10 groundwater monitoring wells for volatile organic compounds, mobilizing staff, managing investigation derived waste, and generating a report. An analysis of monitoring costs at twenty DSCA sites across the state resulted in an average cost of \$10,000 to perform one monitoring event of 10 groundwater monitoring wells.
- As a “worst-case” cost scenario, each of the five sites are presumed to be undergoing biennial groundwater monitoring until soil contaminants degrade to concentrations that meet an IELCR of 1 in 100,000.
- There is significant uncertainty in the amount of time necessary for such degradation to occur due to the heterogenic nature of soil matrices, including organic content, geochemistry, microbial content, porosity and permeability. A range based on professional judgement is between 5 and 20 years for such degradation to occur.
- Assumes monitoring costs will grow at the rate of general inflation.

2. Remediate soils to concentrations that meet the IELCR of 1 in 100,000.

Estimated remediation costs:	\$63,000 per remedy
Frequency:	One site every 5 years
Estimated total annual costs:	<b>\$13,000</b>
Present value of costs over 20 yrs:	<b>\$148,000</b>

Assumptions:

- Remediation costs include pre-characterization sampling, mobilization, excavation of a projected 60 tons of soils exceeding IELCR of 1 in 100,000 (but less than 1 in 10,000), disposal of non-hazardous soil, backfill with clean fill, and report generation.
- An evaluation of excavation costs at five DSCA sites with similar excavated volumes of soil resulted in an average present value cost of \$63,000 for a 60-ton soil excavation. This cost estimate is considered high because the available data is associated with excavation of PCE impacted soil which requires (i) more detailed pre-characterization sampling additional sampling, and (ii) managing soil as hazardous waste, neither of which are necessary for petroleum solvent contamination.
- As a “worst-case” cost scenario, one site is presumed to undergo remediation once every 5 years. Such remedies are occasionally undertaken when an opportunity arises (e.g., a building is demolished, or a tenant space is vacated) allowing the program to save funds by remediating soils that may not otherwise be accessible. For this cost analysis, such remedies are presumed to be limited to soil that exceeds an IELCR of 1 in 100,000 but meets the IELCR of 1 in 10,000.

- Assumes an inflation-adjusted remediation cost growth rate of approximately 1.7% per year, based on analysis of IHS Markit's construction sector wage projections for North Carolina.

#### Future petroleum solvent sites

There are currently five existing petroleum solvent sites in the DSCA program where cancer risks are the primary factor in cleanup decisions. The program has been in existence 20 years. It is projected that the rate of new petroleum solvent sites (where cancer risks are the driver) entering the program will remain stable at one every 4 years or 0.25 sites per year.

The current trend in the dry-cleaning industry is to move away from the use of chlorinated dry-cleaning solvents and toward petroleum based solvents. While the trend toward increased petroleum solvent use may suggest that the number of petroleum solvent sites in DSCA will rise, we believe the following factors will off-set this development toward a more stable trend:

1. To the best of our knowledge, all sites in the DSCA Program are legacy sites, meaning those that were contaminated as a result of dry-cleaning practices or catastrophic incidents that occurred prior to the DSCA, RCRA, and NESHAP regulations that govern how dry-cleaning solvents and solvent wastes are to be safely managed. We believe that sites coming into DSCA in the future will also be legacy sites and the ratio of petroleum vs chlorinated solvent sites will be consistent/stable in the future.
2. While more dry-cleaners are switching to petroleum, the total number of dry-cleaners is decreasing. In NC, the number of full-service active cleaners has decreased from about 850 in 2008 to about 515 in 2017.
3. Existing regulations and DSCA's education assistance efforts have increased compliance among the dry-cleaning community from about 7% in 2007 to about 85% in 2017. The likelihood of a current release has been dramatically reduced in the last 10 years by the presence of a DSCA compliance program and its outreach efforts.
4. Due to its characteristics (e.g., density, degradability, etc.), petroleum solvent is more readily contained and removed than chlorinated solvent in the event of accidental spillage. Additionally, if such a release occurs, petroleum solvent is less likely pose a significant threat to groundwater and indoor air.

Total estimated annual costs for DSCA to continue to manage the sites that will otherwise benefit from this proposed change to the IELCR ranges from **\$14,000 to \$38,000/year**. The present value<sup>1</sup> of the expected savings to the DSCA Program over the next 20 years is **\$252,000 to \$412,000**.

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<sup>1</sup> Calculated as of November 2017 using a 7% discount rate.

### ***Explanation of Estimated Benefits – DSCA Petitioner Savings***

Each site in the DSCA cleanup program has a “petitioner” who is responsible for a co-payment obligation. That co-payment obligation averages 1.5% of the costs incurred by the DSCA Program. The co-payment obligation is satisfied when the DSCA Program has incurred \$1,000,000 in expenses at the site.

Co-payments that may be required under the scenarios described above are anticipated to range from \$200 - \$580 annually. With the proposed change to the IELCR, petitioner payments for the affected sites are estimated to be reduced by up to \$565 annually.

#### Assumptions:

- Petitioners payment estimates are based on the DSCA Program performing bi-annual monitoring at the affected sites and conducting soil remediation at an affected site once every 5 years.

## **IV. Costs**

Impacts evaluated in this analysis also include costs to the State in reduced revenue and costs to the public from potential additional cancer care.

### ***Explanation of Estimated Costs – DSCA Petitioner Payments***

As noted in the discussion of benefits above, co-payments that may be required to be paid to the DSCA program by petitioners under the scenarios described above are anticipated to range from \$190 - \$565 annually. It is estimated that under the proposed rule, petitioners would not incur these costs and therefore the revenue from these payments would not be received by the DSCA Program.

### ***Explanation of Estimated Costs – Cancer Care***

Amending the upper end of the allowable cumulative cancer risk range raises contaminant concentrations that will be allowed to remain in soil and indoor air at dry-cleaning sites in the DSCA Program. Consequently, there will be an incrementally small increase in cancer risk if people are exposed to the remaining contaminants. Groundwater and surface water are not affected by this proposed rule change because the applicable standards are established in 15A NCAC 02L and 15A NCAC 02B, respectively.

The small increase in cancer risk is not considered to be quantifiable because of the conservative nature of risk evaluation assumptions, the very limited population that could potentially be exposed to remaining contaminants, the brief duration of exposure that would reasonably be expected if an exposure occurs, and the disproportionately large number of background cancer incidents. The following discussion outlines these assumptions in further detail.

A risk level of 1 in a million implies a likelihood that up to one person, out of one million people equally exposed to the contamination would contract cancer if exposed continuously (24 hours per day) to the specific concentration over 70 years (an assumed lifetime). This would be in addition to those cancer cases that would normally occur in an unexposed population of one million people (EPA, <https://archive.epa.gov/airtoxics/nata/web/html/gloss.html#oneinamillion>). In other words, a contaminant concentration that poses a 1 in 1,000,000 individual excess lifetime cancer risk would be expected to result in one incident of cancer above background from the one million people exposed to that concentration continuously (24/7) over a 70-year lifespan. Similarly, a concentration posing a 1 in 10,000 individual excess lifetime cancer risk would be expected to result in one incident of cancer above background from the ten thousand people exposed over a 70-year lifespan. “The expression of the estimated cancer risk is not a prediction that cancer will occur, it represents the upper bound estimate of the probability of additional cancers, and merely suggests that there is a possibility. The actual risk might be much lower, or even no risk”. (*Health Consultation for the Ward Transformer Site, NC Department of Health and Human Services, 3/31/2017*)

To properly evaluate risk from exposure to contamination it is necessary to consider the risk in context with background cancer incidents. In North Carolina, approximately 30% of women and 50% of men (about 40% combined), will be diagnosed with cancer in their lifetime from a variety of causes. This is referred to as the “background cancer risk” (*Health Consultation for the Ward Transformer Site, NC Department of Health and Human Services, 3/31/2017*). In numerical terms, this means that out of 1 million North Carolinians, the background number of cancer incidents is 40% or 400,000. If these 1 million people are also exposed to a cancer-causing contaminant their entire life, then the expected number of cancer incidents will be 400,001 instead of 400,000. Applying this background analysis to a contaminant concentration representing an excess lifetime cancer risk of 1 in 10,000, it would potentially result in 4,001 cancer incidents instead of 4,000 from a population 10,000.

Given our understanding of the sites for which the proposed rule change will apply, it is the DSCA Program’s professional judgement that the population that may potentially be exposed to a lifetime’s exposure is nominal to none, and the exposure duration for the population that may encounter the contamination is an extremely small fraction of a lifetime’s exposure. The considerations that lead us to this determination are:

1. The number of sites where an exposure could occur is very limited. Currently, there are five DSCA sites (out of 406 sites in the program), or 1.2%, that are expected to be affected by the proposed rule change. Additionally, the predicted rate of petroleum solvent sites entering DSCA for which the proposed rule change will be applicable is estimated at one new site every four years.
2. Most dry-cleaning sites occur in commercial or retail settings, so there is practically no opportunity for persons to experience a lifetime exposure to contaminants. While there may be a greater number of individuals that occupy commercial or retail space, the length of time that most individuals (consumers) would potentially be exposed is limited to 1-2 hours. There is also a potential for employees to be exposed, but the exposure



would be expected to be limited to 40-hours/week for an average of 4.2 years (*Employee Tenure in 2016, Bureau of Labor Statistics, September 2016*). Compared to a continuous 70-year lifetime exposure, the employee or consumer exposure is very limited.

3. Given that petroleum solvents degrade more readily than chlorinated solvents, petroleum solvent releases in the environment are significantly less likely (than chlorinated solvents) to cause vapor intrusion problems (*Petroleum Hydrocarbons and Chlorinated Solvents Differ in Their Potential for Vapor Intrusion, EPA, March 2012*). Specifically, when considering the scenario of an employee's potential exposure referenced above; (i) employees generally won't be exposed to soil contamination; and (ii) due to the degradation of petroleum solvents, it is very unlikely that an employee will be exposed to petroleum solvent contaminants via the vapor intrusion pathway.
4. When residential areas are affected by dry-cleaning solvent contamination being addressed by the DSCA Program, it has always been related to the migration of chlorinated solvents rather than petroleum solvents. Petroleum solvent contaminants tend stay close to the area where the release occurred, and degrade more readily as noted above.

It is acknowledged that amending the cancer risk range to be consistent with DEQ's risk-based programs may result in an increased excess cancer risk for a population exposed to remaining contamination. However, based on the conservative nature of risk evaluation assumptions, the very limited potential for exposure as described above, and the disproportionately large percentage of background cancer incidents, the impact of the increased risk is so small that the Program has concluded that it is not quantifiable.

## V. Summary of Impacts

Amending the risk range to align with other DEQ risk-based cleanup programs will allow the DSCA Program to save an estimated **\$14,000 to \$38,000/year** in monitoring and remediation costs. For DSCA sites where these savings can be realized, petitioners would save **\$200 to \$580** in annual co-payments. However, the estimated reduction in petitioner co-payments means a loss of that revenue for the Program, and consequently those impacts will offset one another. The total impact of the proposed changes to 15A NCAC 02S is estimated at a present value savings over the next 20 years of **\$256,000 to \$419,000**.

It is acknowledged that amending the cancer risk range to be consistent with DEQ's risk-based programs may result in an increased excess cancer risk for a population exposed to remaining contamination. Based on the conservative nature of risk evaluation assumptions, the very limited potential for exposure as described above, and the disproportionately large percentage of background cancer incidents, the impact of the increased risk is so small that the Program has concluded that it is not quantifiable.

**Appendix: Rules for Readoption including Proposed Amendments**

The following 15A NCAC 02S rules for readoption are considered necessary with substantive public interest and include proposed amendments.