Economic Analysis of Significant New Use Rule for 35 Chemical Substances (EPA Docket EPA-HQ-OPPT-2021-0847)

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-- Does not contain TSCA CBI –

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Executive Summary

This Economic Analysis estimates the potential costs of Significant New Use Rules (SNURs) covering 35 chemicals that have been the subject of TSCA premanufacture notices (PMNs). Appendix A lists each regulated chemical's generic or specific chemical name and Chemical Abstract Service Registry Number (CASRN) (if non-confidential). The SNURs are being published under the rulemaking docket number EPA-HQ-OPPT-2021-0847. The SNURs define "Significant New Uses" that trigger EPA notification requirements. Persons subject to this SNUR would be required to notify EPA at least 90 days before commencing any significant new use. The required notification initiates EPA's evaluation of the conditions of use associated with the intended new use within the applicable review period. Manufacturing and processing for the significant new use are prohibited from commencing until EPA has conducted a review of the notice, made an appropriate determination on the notice, and taken such actions as are required in association with that determination.

To submit a Significant New Use Notice or request a SNUR modification, a firm incurs a modest submission cost, plus costs of any additional data generated to support the submission. By avoiding a Significant New Use, a firm can avoid submission costs, but may incur other compliance costs. For example, it may incur costs associated with restricting chemical releases to water or preventing worker exposure. The options available to a firm considering the manufacture, import, and/or processing of a chemical covered under a SNUR, and the types of associated costs to the firm, are summarized in Table ES-1.

It should be noted that the costs listed in Table ES-1 may be incurred for reasons other than the SNUR. The costs of avoiding a Significant New Use are attributable to the SNUR only if, in the absence of the SNUR, the firm would have adopted a different approach. For example, a SNUR may define any use other than that described in the PMN as a Significant New Use. If the PMN submitter would have conformed to the uses described in the PMN even without the SNUR, then any associated costs of adhering to the PMN uses would not be due to the SNUR. Costs to a PMN submitter of practices required by a TSCA Section 5(e) Consent Order would be attributable to the Consent Order, not the SNUR. If a processor would have workers wear gloves even without SNUR requirements, then the gloves costs would not be attributable to the SNUR. The costs in Table ES-1 are attributable to the SNUR only if the firm adopts a different approach due to the Significant New Use Rule.

Table ES-1: Summary of Compliance Options and Associated Costs Potentially Incurred by a Firm due to a SNUR

Option[1]		Costs	Quantified Costs per Chemical (2020$)[2]
1	Satisfy the limits and/or requirements specified in the SNUR, such as limiting water releases, engaging in PMN uses only, importing only, limiting volumes, providing workplace protection, or providing hazard communications.	Costs of meeting haz-comm, personal protective equipment, and recordkeeping requirements are quantified in this analysis. Other costs, such as of complying with water release restrictions, limiting volume, avoiding domestic manufacture, and foregoing non-PMN uses, may exist but are not quantified.	Typically, annual costs for recordkeeping are under $515. For the few SNUR chemicals where these apply, annual costs for worker protection may be $39,361 or more and for haz-comm are $1,598
2	Submit a request for modification or revocation of the SNUR (§721.185).	Costs of submitting a request for modification or revocation, including costs of developing supporting data (e.g., testing, if needed).	$7,834 submission cost plus any testing costs.[3] EPA receives very few such requests, typically 0-3 per year
3	Submit a Significant New Use Notice (SNUN), indicating to EPA that the firm would like to manufacture, import, or process the chemical for a Significant New Use – i.e., in some way other than what is specified as allowable in the SNUR.	Costs of submitting a SNUN, including associated recordkeeping and SNUN fee.[3] Testing costs are also possible, but only for a small minority of chemicals, and so are not assigned to this option in Table 2-8.	$26,854 submission cost (including SNUN recordkeeping and $19,020 SNUN fee)[4] plus ongoing recordkeeping costs of under $515. EPA usually receives well under ten SNUNs in a year. Based on review of recent SNUNs, it appears that firms rarely conduct toxicity or fate testing to support a SNUN (such testing would be voluntary).
4	Petition EPA for an equivalency determination to consider alternative controls to prevent release or exposure that are equivalent to those identified in the SNUR (§721.30).	Costs of submitting a request for equivalency determination.	$7,834 one-time submission cost.
5	Do not manufacture, import, or process the substance except for R&D (the R&D exemption is covered in 40 CFR §721.47).	Cost of profits foregone due to delaying or avoiding commercial activity originally that would otherwise be pursued. R&D recordkeeping costs if manufacture for R&D.	Costs not quantified.

Notes:

Section numbers refer to 40 CFR §721 (in the Code of Federal Regulations).

[1] Firms may follow multiple Options simultaneously.

[2] Quantified costs are attributable to the SNUR Significant New Use definition only if a firm would not otherwise follow the specified practices. $39,361 is the annual cost for dermal protection selection; impermeability testing, heavy-duty gloves, and a lower-cost respirator (see Table 2-4). Some firms may have export notification costs (see Chapter 3 of this report).

[3] On September 27, 2018, EPA finalized a fees rule under TSCA, as amended in 2016 by the Frank R. Lautenberg Act Chemical Safety for the 21st Century Act. The final rule establishes new fees for actions under TSCA sections 4, 5, and 6 (83 FR 8212) to defray a portion of TSCA implementation costs. The new fee for large businesses submitting SNUNs is $19,020 for a PMN or SNUN submission ($3,300 for qualifying small businesses).

[4] SNUR chemicals not on the TSCA Inventory are "new" chemicals requiring a PMN, so some firms may need to make a submission before commercial production or import, even in the absence of a SNUR (see Section 2.3 of this report).

Sources:

Costs are derived in Table 2-3 through Table 2-8.

1 Introduction

This report presents the U.S. Environmental Protection Agency (EPA), Office of Chemical Safety and Pollution Prevention's (OCSPP's) analysis of the potential costs incurred as a result of Significant New Use Rules (SNURs) being promulgated for 35 chemical substances which have gone through premanufacture notice (PMN) review and no substances that have gone through microbial commercial activity notice (MCAN) review[1] The SNURs are being published under the rulemaking docket number EPA-HQ-OPPT-2021-0847. Appendix A lists the generic or specific chemical name and Chemical Abstract Service Registry Number (CASRN) (if non-confidential) for each PMN and MCAN.

1.1 Statutory Authority and Significant New Uses under the SNURs

EPA may promulgate a SNUR for a substance when (1) the substance is the subject of a Toxic Substances Control Act (TSCA) Section 5(e) Consent Order (40 CFR §721.160), or (2) the Agency determines that activities other than those described in the PMN or MCAN may result in significant changes in human exposure or environmental release levels and/or that concern exists about the substance's health or environmental effects (40 CFR §721.170). In contrast to PMN requirements, which apply mainly to manufacturers and importers (15 USC §2604(a)(1)(A)(i), 40 CFR §720.22), the SNUR applies to processors as well as to manufacturers and importers (15 USC §2604(a)(1)(A)(ii), 40 CFR §721.5).

Each substance analyzed here was the subject of at least one premanufacture notice or microbial commercial activity notice submitted under TSCA, and is now being regulated as a result of the notice's review. For the current rulemaking, 19 of the 35 chemicals have commenced commercial manufacture or import and so are listed on the TSCA Inventory; they are no longer "new" chemicals. For chemicals in this type of rulemaking, SNUR requirements are sometimes based on past Consent Orders entered into with a PMN, MCAN, or SNUN submitter under TSCA Section 5(e). For the current rulemaking, all of the substances have SNUR requirements based on prior Consent Orders.

EPA promulgates a SNUR to designate specific activities involving the chemical substance that EPA has determined constitute a "significant new use." No person may manufacture or process a chemical substance for a significant new use, unless they submit a significant new use notice (SNUN) to EPA at least 90 days in advance. The required notification initiates EPA's evaluation of the conditions of use associated with the intended new use within the applicable review period. Manufacturing and processing for the significant new use are prohibited from commencing until EPA has conducted a review of the notice, made an appropriate determination on the notice, and taken such actions as are required in association with that determination. Examples of typical "significant new uses" that can trigger the requirement to submit a SNUN (if EPA has promulgated a SNUR applying these requirements to a specific chemical) include:

- Domestic manufacture in the United States

[1] This report covers chemicals that went through PMN or MCAN review and are part of an expedited rulemaking. The relevant Office of Management and Budget Information Collection Request number is ICR No. 0574 (OMB Control Number 2070-0012). EPA also promulgates SNURs through conventional rulemaking that are covered by ICR No. 1188 (OMB Control Number 2070-0038).

- Manufacture of a particular aggregate or annual volume
- Use other than that specified in the PMN or MCAN
- Releases to water resulting in a surface water concentration exceeding a specified amount
- Handling the chemical without employing specified personal protective equipment (e.g., gloves, goggles, respirators) or hazard communication (haz-comm) measures (e.g., label, MSDS, worker training)

If EPA does not promulgate a SNUR for a given chemical, then these requirements would not apply (unless they apply to a PMN submitter via a §5(e) Consent Order). If EPA has promulgated a SNUR containing these types of significant new use designations, as long as the person does not engage (nor intend to engage) in any activities defined by the SNUR as a significant new use, then that person may proceed to handle the chemical without submitting a SNUN.

1.2 Summary of Methodology

This analysis quantifies, to the extent possible, the costs to society of the rule by identifying the costs to industry associated with complying with the rule, and the costs to EPA of administering the rule. Types of industry costs analyzed include those for worker protection, hazard communication, testing, submission of required information, export notification, and recordkeeping. Agency costs include reviewing and processing the data received as a result of the rule. Data sources for this analysis include burden estimates derived from previous Information Collection Requests (ICRs) and economic analyses for related rules, compensation data acquired from government publications, and supplementary market research to produce an estimate of the universe of affected entities and measure the impact of the rule on small entities.

In previous economic analyses of SNURs, EPA identified those requirements under Subparts A, B, C, and D of 40 CFR §721 that may indirectly impose costs on manufacturers, importers, and processors of MCAN microorganisms or PMN substances (e.g., EPA 1989). Some of these costs, such as providing personal protective equipment under §721.63, were estimated in earlier SNUR economic analyses and are presented as part of this analysis. Resources were not available to quantify other costs, such as for limiting releases to water, avoiding uses not listed in the PMN or MCAN, or keeping production below a specified level; they are described only qualitatively.

It was not feasible within available resources to aggregate costs, or to estimate how often costs are actually incurred as a result of SNURs, except for costs of SNUN submissions.

1.3 Organization of this Report

The remainder of this report estimates the quantified portion of costs potentially associated with SNURs such as those included in this rulemaking. Chapter 2 presents estimates of the costs that could be incurred by manufacturers, importers, and/or processors under the various SNUR options. Chapter 3 addresses export notification costs. Chapter 4 addresses costs to EPA of administering the SNURs, while Chapter 5 presents an analysis of other impacts, as required by various statutes and executive orders. Appendix A lists the chemicals that are subject to the SNUR. Appendix B provides the wage rates and inflators used in this analysis. Appendix C provides costs of hazard communication, worker protection, and recordkeeping requirements, and Appendix D presents a list of references used in this economic analysis.

2 Costs of a Significant New Use Rule (SNUR), by Option

A SNUR specifies requirements that a firm must meet if it chooses to manufacture, import, or process a PMN chemical or MCAN microorganism without engaging in a Significant New Use that would trigger notification to EPA. A SNUR also requires recordkeeping for anyone manufacturing, importing, or processing the SNUR chemical. A SNUR recommends testing, but does not require testing. EPA rarely receives results of tests performed specifically to support a SNUN. Table 2-1 sets forth possible responses to a SNUR. A firm may select more than one course of action. For example, it may produce a chemical in a way that avoids a Significant New Use, while simultaneously submitting a SNUN for a proposed new use. These options are described below along with their costs.

Table 2-1: Summary of Compliance Options and Associated Costs Potentially Incurred due to a SNUR

Option[1]		Costs	Quantified Costs per Chemical (2020$)[2]
1	Satisfy the limits and/or requirements specified in the SNUR, such as limiting water releases, engaging in PMN or MCAN uses only, importing only, limiting volumes, providing workplace protection, or providing hazard communications.	Costs of meeting haz-comm, personal protective equipment, and recordkeeping requirements are quantified in this analysis. Other costs, such as of complying with water release restrictions, limiting volume, avoiding domestic manufacture, and foregoing non-PMN or MCAN uses, may exist but are not quantified.	Typically, annual costs for recordkeeping are under $515. For the few SNUR chemicals where these apply, annual costs for worker protection may be $39,361 or more and for haz-comm are $1,598
2	Submit a request for modification or revocation of the SNUR (§721.185).	Costs of submitting a request for modification or revocation, including costs of developing supporting data (e.g., testing, if needed).	$7,834 submission cost plus any testing costs.[3] EPA receives very few such requests, typically 0-3 per year
3	Submit a Significant New Use Notice (SNUN), indicating to EPA that the firm would like to manufacture, import, or process the chemical for a Significant New Use – i.e., in some way other than what is specified as allowable in the SNUR.	Costs of submitting a SNUN, including associated recordkeeping and SNUN fee.[3] Testing costs are also possible, but only for a small minority of chemicals, and so are not assigned to this option in Table 2-8.	$26,854 submission cost (including SNUN recordkeeping and $19,020 SNUN fee)[4] plus ongoing recordkeeping costs of under $515. EPA usually receives well under ten SNUNs in a year. Based on review of recent SNUNs, it appears that firms rarely conduct toxicity or fate testing to support a SNUN (such testing would be voluntary).
4	Petition EPA for an equivalency determination to consider alternative controls to prevent release or exposure that are equivalent to those identified in the SNUR (§721.30).	Costs of submitting a request for equivalency determination.	$7,834 one-time submission cost.
5	Do not manufacture, import, or process the substance except for R&D (the R&D exemption is covered in 40 CFR §721.47).	Cost of profits foregone due to delaying or avoiding commercial activity originally that would otherwise be pursued. R&D recordkeeping costs if manufacture for R&D.	Costs not quantified.

Notes:
Section numbers refer to 40 CFR §721 (in the Code of Federal Regulations).
1 Firms may follow multiple Options simultaneously.
2 Quantified costs are attributable to the SNUR Significant New Use definition only if a firm would not otherwise follow the specified practices. $39,361 is the annual cost for dermal protection selection; impermeability testing, heavy-duty gloves, and a lower-cost respirator (see Table 2-4). Some firms may have export notification costs (see Chapter 3 of this report).
3 On September 27, 2018, EPA finalized a fees rule under TSCA, as amended in 2016 by the Frank R. Lautenberg Act Chemical Safety for the 21st Century Act. The final rule establishes new fees for actions under TSCA sections 4, 5, and 6 (83 FR 8212) to defray a portion of TSCA implementation costs. The new fee for large businesses submitting SNUNs is $19,020 for a PMN, MCAN, or SNUN submission ($3,300 for qualifying small businesses).4 SNUR chemicals or microorganisms not on the TSCA Inventory are "new" and require a PMN or MCAN, so some firms may need to make a submission before commercial production or import, even in the absence of a SNUR (see Section 2.3 of this report).
Sources:
Costs are derived in Table 2-3 through Table 2-8.

2.1 Comply with SNUR Limits (Option 1)

A firm can avoid engaging in a Significant New Use and submitting a SNUN by meeting all applicable SNUR requirements. The firm may also pursue this option temporarily by complying with SNUR restrictions while also pursuing other options such as making a submission to EPA. If it does avoid engaging in a Significant New Use (and if the chemical is on the TSCA Inventory or if the firm has already submitted a PMN), no notice to EPA is required.[2] Table 2-2 shows the types of requirements a firm must meet to avoid engaging in a Significant New Use.

The Significant New Use designation in a SNUR for a specific chemical or microorganism reflects either the use scenario described in the PMN or MCAN for that chemical or microorganism (what the submitter was already planning to do) or the requirements in the 5(e) Consent Order resulting from the PMN or MCAN submission. Thus, it is likely that the typical submitter will incur no added costs of complying with the SNUR requirements so as to avoid a Significant New Use. However, if there is any export of these chemicals, there will be export notification costs that result from the TSCA Section 12 (b) requirements that are automatically triggered for chemicals regulated under TSCA Section 5 (see Chapter 3 for details).

[2] Under the Toxic Substances Control Act § 3(9), if a chemical is not on the TSCA Inventory, it is a "new chemical." Prior to manufacture or import of a new chemical for general commercial use, a notice must be filed with EPA under Section 5(a)(1)(A) of TSCA (40 CFR §720.3 and 40 CFR §720.22).

Table 2-2: Production and Use Restrictions/Requirements

40 CFR Reference (Code of Federal Regulations)	Restriction/Requirement	Number of Chemicals Affected[1]	Sample Costs Per Chemical (2020$)
§721.63[2]	Workplace protection	0	$18,507 to $39,275
§721.72	Hazard communication	35	$1,577
Industrial Commercial, and Consumer Activities (§721.80)			
§721.80(a, b, c)	Enclosed use only	0	Not quantified
§721.80(d, e)	Use at site only	0	Not quantified
§721.80(f)	Import only (do not manufacture)	0	Not quantified
§721.80(g, h, i)	Use only as intermediate	3	Not quantified
§721.80(j, k)	Engage only in uses listed in PMN, MCAN, or Consent Order	33	Not quantified
§721.80(l, m, n, o)	Limits non-industrial uses	0	Not quantified
§721.80(p, q, s, t)	Limit production volume	23	Not quantified
§721.80(r, u)	Volume-triggered testing	0	Not quantified
§721.80(v, w, x, y)	Restricts physical form of chemical	0	Not quantified
Disposal, water release, recordkeeping			
§721.85	Disposal	0	Not quantified
§721.90	Limit releases to water	1	Not quantified
§721.125[3]	Recordkeeping for all manufacturers, importers, and processors	35	Up to $515

Notes:
[1] Some chemicals have more than one type of restriction.
[2] $18,392 is the annual cost for dermal protection selection and heavy duty gloves. $38,803 is the annual cost for dermal protection selection; heavy duty gloves, impermeability testing/evaluation of manufacturer specifications, and a lower-cost respirator (see Table 2-4).
[3] This excludes SNUN recordkeeping under §721.40. See the recordkeeping discussion in Appendix C.
Sources:
Costs are summarized in Table 2-4, Table 2-5, and Table 2-6, and derived in Appendix C.

The costs of meeting the haz-comm, protective equipment, and recordkeeping requirements are quantified for this report. Appendix C presents a more detailed derivation of these costs. The export notification costs are summarized in Chapter 3. Complying with requirements to avoid a Significant New Use also may result in additional costs that affect a significant number of the chemicals, such as costs associated with limiting releases to water, that were not quantified for this report; these costs are also summarized below.

2.1.1 Protection in the Workplace

Requirements. Under 40 CFR §721.63, manufacturers, importers, or processors must comply with worker protection requirements as specified in the SNUR on the regulated chemical, or else submit a SNUN. The core components of the worker protection requirements include provision of personal protective equipment (PPE) such as gloves, goggles, protective clothing, and respirators.

In some cases, EPA specifies the type of PPE required. In other cases, EPA requires adequate dermal protection but does not specify particular PPE. Instead, it requires the employer to evaluate worker

exposure conditions and hazards, and select appropriate PPE. Generally, the employer is also required to determine that dermal PPE is impervious to the PMN substance by one or both of the following methods: (1) perform impermeability testing on the PPE under the expected conditions of exposure, and/or (2) rely on equipment manufacturers' specifications. Employers not already providing adequate dermal protection would need to do so.

Costs. Annual costs for worker protection items are shown in Table 2-3 below. The derivation of the sample minimum and maximum annual costs for worker protection is found in Table 2-4. The costs of worker protection were originally estimated in a 1989 EPA report, *Economic Analysis of Final Significant New Use Rules: General Provisions for New Chemical Follow-Up* (EPA 1989), as a range of costs, depending on the assumed number of worker-days of exposure. This report uses the high end of the assumptions about worker-day exposure, updated to adjust for inflation. The estimates are for one chemical at one site with 25 exposed workers; actual costs would vary with the number of workers. Appendix C gives the detailed cost derivation.

Table 2-3: Annual Costs of Workplace Protection Requirement

Personal Protective Equipment and Requirement Citation at 40 CFR	Unit Cost (2020$)[1]	Quantity Required[1]	Total Annual Cost (2020$)
Dermal Protection Selection §721.63(a)(1)			
10 hours industrial hygienist (IH) time	$63.17	10	$632
Impermeability Testing §721.63(a)(3)			
Impermeability Test	$1,640	1	$1,640
Evaluation of Manufacturer's Specifications	$253	1	$253
Gloves §721.63(a)(2)(i)			
Standard (disposable)	$0.30	6,250	$1,875
Heavy-duty butyl	$71.50	250	$17,875
Protective clothing §721.63(a)(2)			
(ii) - Full-body (coverall with hood)	$46.19	75	$3,464
(iv) - Coverall (no hood)	$22.51	75	$1,688
Eyewear §721.63(a)(2)(iii)			
Standard goggles	$5.08	75	$381
Heavy-duty goggles	$15.21	75	$1,141

Table 2-3: Annual Costs of Workplace Protection Requirement

Personal Protective Equipment and Requirement Citation at 40 CFR	Unit Cost (2020$)[1]	Quantity Required[1]	Total Annual Cost (2020$)
Respirator Types[3]			
Supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting full facepiece. (similar to §721.63(a)(5)(ii))	$2,041	25	$51,025
Supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a hood or helmet or tight-fitting facepiece (either half- or full-face). (similar to §721.63(a)(5)(iii))	$2,575	25	$64,375
Air-purifying respirator equipped with a tight-fitting full facepiece and High Efficiency Particulate Air (HEPA) filters.(similar to §721.63(a)(5)(iv))	$755	25	$18,875
Air-purifying, tight-fitting respirator (either half- or full-face) equipped with N100 (if aerosols absent), R100, or P100 filters. (similar to §721.63(a)(5)(iv))	$755	25	$18,875
Powered air-purifying, tight-fitting full-face respirator equipped with N100 (if oil aerosols absent), R100, or P100 filters. (similar to §721.63(a)(5)(v))	$2,739	25	$68,475
Powered air-purifying respirator equipped with a tight-fitting facepiece (either half- or full-face) and HEPA filters. (similar to §721.63(a)(5)(v))	$2,739	25	$68,475
Powered air-purifying respirator equipped with a loose-fitting hood or helmet and High Efficiency Particulate Air (HEPA) filters. (similar to §721.63(a)(5)(vi))	$5,786	25	$144,650

Notes:

[1] Quantities assume: 1) 25 workers exposed 250 days per year; 2) standard gloves replaced daily and heavy-duty gloves replaced every 25 days; 3) respirator units replaced annually and cartridge sets replaced every five days (50 cartridges sets per year); 4) goggles and protective clothing replaced three times yearly.

[2] This table lists respirator choices that typically would satisfy SNUR requirements for a particular chemical, for current and recent SNURs. Future SNURs may list different choices. The citations in brackets refer to respirator types listed at 40 CFR. While the SNURs no longer reference the §721.63(a)(5) categories, costs in this analysis are based on costs estimated in 2014 for the §721.63(a)(5) categories. See Table C-6 for the crosswalk between respirator types in SNURs and in this table. The respirator "unit cost" is per worker. Total respirator costs include costs of the respirator plus the costs of any add-on items such as hoods, helmets, cartridges, filters, and caps, if these items are required for a particular respirator.

Sources:

Appendix C, Table C-1 through Table C-8.

The costs of purchasing protective equipment are derived in Appendix C, and have been annualized based on the assumptions listed above regarding their use and lifetime in the workplace. Costs for evaluating hazards when PPE is not specified in the SNUR are based on estimates of the reasonable time required for a safety professional to perform such evaluations. Costs for conducting impermeability testing are based on consultation with PPE vendors, as described in Appendix C. Table 2-3 summarizes the annual costs associated with protection in the workplace, including the PPE itself, as well as selecting required dermal protection, and performing impermeability testing and/or evaluating manufacturer's information.

Table 2-4 shows a sample of the minimum and maximum annual cost of workplace protection, assuming 25 workers who are exposed for 250 hours per year. The minimum cost includes the cost of heavy-duty butyl gloves, and 10 hours of an industrial hygienist's time for dermal protection selection. The maximum cost includes the cost of gloves, dermal protection, impermeability testing, and the annual cost of the least expensive respirator and filters for 25 workers.

Table 2-4: Sample Costs of Workplace Protection

Cost Element	Annual Cost (2020$)
Example #1: Gloves and Dermal Protection Selection	
Heavy-duty butyl Gloves	$17,875
Dermal Protection Selection	$632
Total per site with 25 workers	**$18,507**
Example #2: Gloves, Testing, and Respirator	
Heavy-duty butyl Gloves	$17,875
Dermal Protection Selection	$632
Impermeability Test	$1,640
Evaluation of Manufacturer's Specifications	$253
Least Cost Respirator	$18,875
Total per site with 25 workers	**$39,275**
Source: Table 2-3	

In cases where the SNUR specifies the type of protective gear, the estimates assume workers would not otherwise wear adequate protective equipment. To the extent that workers would otherwise be adequately protected (as a result of the company's own safety program related to other chemical hazards, or to comply with OSHA's PPE standards), these costs may be an overestimate of the actual costs.

In some cases, the SNUR requires dermal protection but does not specify any particular gear, allowing regulated companies to make that determination. Table 2-4 shows costs of assessing needs and demonstrating impermeability. These cost estimates would reflect a situation where the dermal protection is already in place but the manufacturer must demonstrate that it is adequate. If companies also have to purchase additional protective gear, incremental costs attributable to the SNUR would include the added items. For example, if a firm already providing gloves and goggles determined that it would have to add protective clothing to avoid engaging in a Significant New Use, this would increase costs even if particular protective clothing is not specified in the SNUR.

2.1.2 Hazard Communication

Requirements. Each SNUR may require firms that manufacture, import, or process one of the PMN substances to implement a haz-comm program for the applicable chemical, or else submit a SNUN. For purposes of the economic analysis, it is assumed that each facility has in place a haz-comm program consistent with that required by OSHA's Hazard Communication standard (29 CFR 1910, 1983). Much of the haz-comm cost methodology used in this analysis came from a 1989 EPA report, *Economic Analysis of Final Significant New Use Rules: General Provisions for New Chemical Followup* (EPA 1989). The cost estimates provided here are for one chemical produced at one site, assumed to have 25 exposed workers and roughly a 10,000-kilogram annual shipment volume. Higher volumes would increase costs,

although not necessarily proportionately. The major elements of a haz-comm program that could apply to a SNUR chemical, based on the requirements in §721.72, are:

- Revision of the existing written haz-comm program to incorporate information about the chemical (§721.72(a));
- Creation of labels and application of labels to containers used for distributing the chemical in commerce (§721.72(b));
- Creation of labels or signage and posting of hazard data in areas of the facility where the chemical is used or stored (§721.72(b));
- Creation and distribution of material safety data sheets (MSDSs) (§721.72(c)); and
- Employee awareness training on where and how the chemical is used, the hazards associated and availability of hazard information about the chemical, and protective equipment and other measures in place to reduce and minimize exposure to the chemical (§721.72(d)).

Costs. The annual costs of compliance with the haz-comm requirements for PMN substances subject to haz-comm requirements appear in Table 2-5. These costs include the purchase of materials such as labels, placards, photocopies, etc. Further, the costs are for substances with full haz-comm requirements, and may overstate haz-comm costs for substances with partial requirements. Appendix C gives the detailed cost derivation.

Table 2-5: Annual Costs of Hazard Communication Requirements

Requirement		Cost (2020$) (labor plus materials)	Hours
Update written program		$253	4
Labeling	$123	$121	0.5
	$436	$432	1.5
MSDS preparation		$495	5.50
Employee training		$270	6.75
TOTAL		**$1,577**	**18.25**

Notes:
[1] Figures are rounded to whole dollars. Substances not subject to all of these requirements may have lower costs.
Sources:
See Table C-9 through Table C-12, and Section C.2.1 for derivations.
Hourly labor costs are derived in Table B-1.

2.1.3 Recordkeeping

Requirements. Under 40 CFR §721.40, recordkeeping is required for SNUN submitters. This recordkeeping cost was included in the SNUN submission cost and is not separately estimated here (EPA 2005b).[3]

In addition, the SNURs specify recordkeeping requirements for manufacturers, importers, and processors, by identifying paragraphs selected from 40 CFR §721.125(a) through (k). These recordkeeping requirements apply even if the firm does not engage in a reportable New Use or make a submission to EPA, so long as it manufactures, imports, or processes the chemical. The recordkeeping requirements vary by chemical. For example, only chemicals that must establish a Hazard Communications program to avoid a Significant New Use would be required to keep records documenting their haz-comm program. (For firms producing under the R&D exemption, R&D recordkeeping would be needed. R&D recordkeeping costs were not estimated for this report.)

SNUR recordkeeping requirements essentially involve electronically storing relevant records, including those related to manufacturing, importing, or processing volumes; shipment amounts and customer information; clothing impermeability determinations; the hazard communication program including labels and MSDS copies; compliance with disposal and water discharge limitations; and/or compliance with restrictions on volumes, nature of manufacture or use, or on the chemical's physical form (powder, liquid etc.).

Costs. Annual costs for compliance with 40 CFR §721.125 recordkeeping requirements are low, but do potentially apply to all SNUR chemicals, and the recordkeeping could continue for years. Costs are

[3] For example, OPPT's Information Collection Request (ICR) for *TSCA Section 5(a)(2) Significant New Use Rules for Existing Chemicals (Renewal)*, October 11, 2005, estimated SNUN recordkeeping costs at 5.67 hours (EPA 2005b, p. 12).

presented in Table 2-6 and derived in Appendix C. They are estimated for one chemical at one site, and include technical and clerical labor time, photocopying charges, and costs for records storage.

Table 2-6 summarizes recordkeeping costs by requirement at 40 CFR §721.125. The totals in Table 2-6 provide the cost if all recordkeeping requirements in paragraphs §721.125 (a) through (k) were required; this would seldom, if ever, be the case for a single chemical.

Table 2-6: Annual Costs of Recordkeeping Requirements (40 CFR §721.125)

40CFR §721.1252	Cost Element	Cost (2020$)[1]	Hours
(a)(b)(c)	Volumes & sales/transfer data	$146	3.56
(d)(e)	Protective clothing (§721.63) and impermeability (§721.63(a)(3))	$6.00	0.15
(f)	Haz-comm program (§721.72)	$75	1.84
(g)	Label copies (§721.72(b))	$1.50	0.04
(h)	MSDS copies (§721.72(c))	$1.50	0.04
(i)	Use limitations compliance (§721.80)	$75	1.84
(j)	Disposal compliance (§721.80)	$180	4.40
(k)	Water discharge compliance (§721.90)	$30	0.73
TOTAL		**$515**	**12.60**

Notes:
[1] Recordkeeping applies to all SNUR chemicals. This table does not cover recordkeeping for SNUN submissions.
Sources:
See Appendix C, Table C-14 for derivations.

2.1.4 Hidden Costs: production volume limits, limiting releases to water, PMN and MCAN uses, import-only, and disposal

Several types of costs that may be incurred by complying with the significant new use designations are not quantified in this report, including production volume limits, releases to water, disposal, and other use restrictions. For example:

- Keeping production volume below specified limits to avoid a Significant New Use could result in a decrease in profits; a potential "hidden" cost. A firm producing for sale may have to restrict its sales of the chemical. If the chemical is for internal use, it may have to substitute to a less cost-effective chemical.

- A producer could incur costs of determining whether discharges to water would constitute a Significant New Use and of limiting releases in order to avoid the Significant New Use.

- Similarly, avoiding uses not listed in the original PMN or MCAN could result in "hidden" costs of foregone profits if the firm cannot market the chemical for certain applications. If the firm wants to use the chemical for internal use, it may have to substitute to other chemicals or technologies that cost more or have lesser performance resulting in higher production costs.

- Importing could be costlier than manufacturing a PMN or MCAN substance in the United States.

2.2 Request Modification or Revocation of a SNUR (Option 2)

Under 40 CFR §721.185, EPA may modify or revoke a SNUR upon review of a submittal from a manufacturer, importer, or processor. Consequently, the second option for a firm is to request modification or revocation of the SNUR. According to New Chemical Program records, EPA receives few modify/revoke requests (typically up to three per year) due to SNURs.

This option may have some or all of the following associated costs:

- One-time costs of testing to develop health and environmental effects data for a chemical subject to the SNUR;
- One-time costs of submitting a request for modification or revocation;
- Ongoing costs of complying with SNUR restrictions (Option 1 in this report) or of avoiding production while the modification request is being processed (Option 5). The firm may also incur costs of complying with any SNUR restrictions that are not ultimately revoked or may incur hidden costs of avoiding production altogether.

These costs are discussed below.

2.2.1 Costs of Developing and Submitting Testing Data

40 CFR §721.185(b)(1) requires that a modification request include "information sufficient to support the request." For each PMN or MCAN substance, the SNUR identifies health, ecological, and/or fate/transport/transformation testing that would help characterize the risks associated with the substance. However, there is no requirement for a requester to perform the recommended tests or even to perform testing at all. It is possible that some of the recommended tests, or other tests, would be performed by the submitter to support a request for modification and revocation of a SNUR. If no additional testing is performed to support a modification request, costs may be similar to costs of a SNUN – discussed later in this section – minus the SNUN fee.

Table 2-7 provides an example of potential costs if a firm were to perform a standard set of basic ecotoxicity tests to support a request to modify or revoke a SNUR.

Table 2-7: Sample Costs of Recommended Testing

Test Guideline	Test Description	Estimated Cost (2020$)
Ecotoxicity Base Set		
OPPTS 850.5400	Algal Toxicity, Tiers I and II	$23,262
OPPTS 850.1010	Daphnid Acute Toxicity	$19,241
OPPTS 850.1075	Fish Acute Toxicity	$26,518
	Sample TOTAL Testing Cost:	***$69,021***

Source:
Table D-1.

2.2.2 Costs for Submitting a Request for Modification or Revocation of a SNUR

The costs associated with submitting a request for modification and revocation of a SNUR (or of submitting a SNUN) are estimated to be similar to the costs for preparing a PMN submission, except that there is no SNUN fee for the modify/revoke request. The PMN submission costs came from EPA's 1994 *Regulatory Impact Analysis of Amendments to Regulations for TSCA Section 5 Premanufacture Notifications,* which relied on industry estimates of the effort needed to collect and compile all data required for a PMN submission, prepare the form, submit the form and data to EPA, and maintain a file of the submission (EPA 1994, Table III-2 and pp. III-11, -12, and -13). The 1994 estimates were based on a survey conducted by the Chemical Manufacturers Association (CMA 1991), which became the American Chemistry Council. The burden associated with PMN submission and preparation has been adjusted to reflect burden reductions resulting from the 2009 final PMN Electronic Reporting (ePMN) Rule that requires the electronic submission of all TSCA Section 5 notices.[4] Electronic submission of SNUN forms is expected to remove all clerical burden associated with preparing a SNUN (EPA 2009b, p. 7). In addition, electronic submission is expected to reduce all recordkeeping burden associated with SNUN submissions by fifty percent. Because, the recordkeeping burden for PMNs was not estimated separately, for the purposes of this report we assume this burden reduction is captured in the removal of all clerical burden.[5]

In the 1994 EPA report, the average effort required to prepare and submit a PMN was 95 to 114 hours. This burden is reduced to 83 to 100 hours after accounting for the ePMN savings (EPA 2009a). This included recordkeeping for the submission, but the recordkeeping cost was not broken out. For this analysis, the costs of a preparing a SNUN were derived using the averages of the hours for each type of labor from the 1994 report, after adjusting for the ePMN savings. The method of calculating hourly loaded labor costs is described in Appendix B.

[4] *Economic Analysis of Expedited Significant New Use Rules for 25 Chemical Substances: EPA Docket OPPT-2009-0922* (EPA 2009a), was the first report to consider the burden reductions resulting from electronic submission of SNUN forms and requests for equivalency determination. Previously, all burdens were based upon 1994 paper submission estimates.

[5] *The Economic Analysis of the Premanufacture Notification Electronic Reporting Final Rule* (EPA 2009b) reported a 0.5 hour clerical and a 0.5 hour technical burden associated with recordkeeping in addition to the burden estimates from the 1994 RIA (EPA 1994, p. III-14). These burden estimates (the 0.5 for clerical burden and 0.5 for technical burden) are based on the recordkeeping burden for polymer exceptions and not the recordkeeping burden associated with PMN submissions. Therefore, for this analysis, the 0.5 hour for clerical labor and the 0.5 hour for technical labor were removed. It is important to note that for this analysis, clerical burden changes are not applicable because the entire clerical burden is assumed to be eliminated under the electronic reporting requirements. In summary, we do not include the one hour recordkeeping burden (0.5 hour for clerical, 0.5 for technical) reported in the ePMN EA.

2.2.3 Other Costs

EPA's review of the submitter's request may cause delays in the start of manufacturing or processing activities. Such delays could cause the company to forego opportunities to earn profits for the duration of the review period. Alternatively, the submitter may elect to produce under the constraints of the SNUR during the review period, so as to avoid a Significant New Use. EPA may not revoke all SNUR provisions as a result of the request. If the company is allowed to continue production and chooses to do so, it would bear costs of complying with any SNUR restrictions that are not revoked. Costs of complying with SNUR restrictions pending EPA modification or revocation were discussed under Option 1.

Each entity subject to a SNUR opting to submit a SNUN must pay a SNUN fee. Currently, a large business must pay a fee of $16,000 per SNUN submission and a small business must pay a fee of $2,800 per SNUN submission.

Table 2-8: Costs of Requirement to Modify/Revoke SNUR or Submit SNUN

Labor Category	Average Hours	Loaded Wage Rate[1] (2020$)	Total Labor Cost (Loaded Wage x Average Hours)		
			Request to Modify SNUR (Option 2)	SNUN (Option 3)	Equivalency Determination (Option 4)
Clerical[2]	0	$35.84	$0	$0	$0
Technical[3]	74.2	$83.76	$6,215	$6,215	$6,215
Managerial[3]	18	$89.93	$1,619	$1,619	$1,619
Subtotal	***92.2***	--	***$7,834***	***$7,834***	***$7,834***
Fees (SNUN only)			$0	$19,020	$0
TOTAL			**$7,406**	**$26,854**	**$7,834**
Test Costs			Sometimes	Rarely	

Notes:
[1] Loaded wages include fringe benefits and overhead. See Appendix B of this report for derivation.
[2] The estimate of no clerical burden is taken from the *Economic Analysis of the Premanufacture Notice Electronic Reporting Final Rule* (EPA 2009b, p. 7).
[3] Hours range for each technical and managerial labor is from the PMN Amendments RIA (EPA 1994, Table III-2 and pp. III-11, -12, and -13).

2.2.4 Total Costs for Option 2

The total costs associated with requesting a modification or revocation of a SNUR include the costs of generating new supporting data plus the administrative cost of preparing the submission.

2.3 Submit SNUN (Option 3)

Under 40 CFR §721.5, manufacturers, importers, or processors who would like to undertake a Significant New Use of a substance listed in a SNUR are required to submit a Significant New Use Notice (SNUN) at least 90 days before the firm plans to commence the manufacture, import, or processing of the substance. For example, they could submit a SNUN if they wish to produce above the volume limit listed in the SNUR for a given chemical, since any production beyond that volume would be defined as a Significant New Use.

The required notification initiates EPA's evaluation of the conditions of use associated with the intended new use within the applicable review period. Manufacturing and processing for the significant new use are prohibited from commencing until EPA has conducted a review of the notice, made an appropriate determination on the notice, and taken such actions as are required in association with that determination. The notice form used to submit a SNUN is the same as that for a PMN, and the costs of submitting a SNUN are estimated based on the costs incurred to submit a PMN.

This option could have the following costs:

- One-time costs of the SNUN and $19,020 fee. (However, in some cases, a notification may be needed for reasons other than the SNUR; see Section 2.3.1 below.)
- Ongoing costs of complying with SNUR restrictions to avoid engaging in a Significant New Use (Option 1 in this report) or of avoiding production while the SNUN is being processed (Option 5); costs of recordkeeping, and of complying with any restrictions resulting from the SNUN review.
- Rarely, the SNUN submitter may elect to perform some of the testing recommended in the SNUR as a way to characterize effects of a chemical. These tests are not mandatory, and firms do not usually conduct testing to support a SNUN, so any such costs are likely to be zero or low.

The assumption regarding testing is based on an analysis of the 18 SNUNs submitted over a three-year period, from 2005 through 2007. A list of human health tests submitted to EPA with PMNs and SNUNs was also available from a confidential database maintained by EPA's Office of Pollution Prevention and Toxics Risk Assessment Division. Only one SNUN described toxicity or environmental fate testing that seemed reasonably likely to have been performed to support a SNUN. In that case, two relatively low-cost tests (fish acute toxicity and daphnid acute toxicity) may have been conducted to support a SNUN, although it is also possible that the testing was done for some other reason not apparent in the SNUN itself. A substantial portion of the SNUNs did provide or reference test results. However, in almost all cases, the testing appeared to have been conducted for reasons other than a SNUR. For example, the SNUN might include laboratory reports that had already been submitted for a PMN for the same chemical.

2.3.1 SNUR "New" Chemicals

If a SNUR chemical is not on the TSCA Inventory and a potential manufacturer or importer has not yet filed a PMN, submission costs may be incurred but are not attributable to the SNUR.

All SNUR chemicals in this rulemaking were the subject of at least one PMN or MCAN. For PMN chemicals to be added to the TSCA Inventory, manufacturing (or import) must have commenced, with notification to EPA through a Notice of Commencement, or NOC. Thus, SNUR chemicals not yet in commercial manufacture (or import) are not on the TSCA Inventory. They legally remain "new" chemicals subject to PMN requirements.

For "new" chemicals, firms that have not yet submitted a PMN must notify EPA 90 days before manufacturing/importing the chemical for commercial purposes. This submission is still designated a PMN but may contain information demonstrating that the submitter intends to engage in a significant new use. Either way, the firm uses the same submission form and provides the data listed at 40 CFR §720.45.

Consequently, for this special situation, the submission cost is incurred due to PMN requirements, not due to the SNUR. (See EPA's 1997 Chemistry Assistance Manual for Premanufacture Notification Submitters for an overview of New Chemicals requirements (EPA 1997)).

2.3.2 Advance Compliance Exemption

Another option available to firms before the SNUR is promulgated is to seek an advance compliance exemption under 40 CFR §721.45(h). The submission cost for this option is the same as that for a SNUN, but by negotiating an advance compliance agreement with EPA a firm might diminish any loss of profits due to delay. This option is not available after the SNUR is promulgated.

2.3.3 Costs for Submitting a SNUN

As with Option 2 above (Request Modification or Revocation of a SNUR), the costs for submitting a SNUN are estimated to be equivalent to the costs of completing a PMN submission. If the SNUN is submitted at the same time as a request to modify a SNUR (Option 2), the added cost would be less than shown here due to overlap in information in the two submissions. Table 2-8 shows the costs of preparing a SNUN.

2.3.4 Potential for Subsequent Regulatory Actions

The Agency recognizes that if a submission of a SNUN does result from a SNUR, the Agency may take additional regulatory actions under TSCA. The required notification initiates EPA's evaluation of the conditions of use associated with the intended new use within the applicable review period. Manufacturing and processing for the significant new use are prohibited from commencing until EPA has conducted a review of the notice, made an appropriate determination on the notice, and taken such actions as are required in association with that determination. It is not known what specific subsequent regulatory actions, if any, the Agency may determine are necessary after reviewing a SNUN. Any such actions are highly dependent on the circumstances surrounding the individual SNUN (e.g., available information and scientific understanding about the chemical and its risks at the time the SNUN is being reviewed).

Should the Agency's review of the SNUN result in further regulatory actions, the Agency will initiate and follow the appropriate procedures for taking those actions. Included in those procedures would be an assessment of the costs and benefits of those actions.

Subsequent regulatory action may be a Consent Order under TSCA Section 5(e). Assessments of costs and benefits for a Consent Order would be limited, similar to those supporting PMN reviews leading to Consent Orders, in contrast to the in-depth benefit-cost analyses prepared under some other TSCA sections.

The description above was adapted from text in *Economic Analysis of the Significant New Use Rule for Chloranil*, January 8, 2008, Section 2.4; *and Economic Analysis of the Final Significant New Use Rule for 183 Perfluoroalkyl Sulfonates*, August 20, 2007, Section 3.4 (EPA 2007c; 2008). Both reports are from the U.S. EPA Office of Pollution Prevention and Toxics, Economic and Policy Analysis Branch. The nature of the follow-up regulatory action and benefit/cost analysis may differ between SNUNs for newer chemicals submitted as a result of a rulemaking such as this one, and SNUNs for older chemicals such as chloranil and most perfluoroalkyl sulfonates.

2.4 Request Equivalency Determination (Option 4)

Under 40 CFR §721.30, EPA may review applications from facilities who propose alternative methods of controlling or preventing exposures or releases to those specified in the SNUR. In these cases, EPA evaluates the alternatives using an abbreviated review process. As shown in Table 2-8, the costs of submitting an equivalency determination request are expected to be the same as those for submitting a SNUN except that no fee is required.

For this option the EPA review period is 45 days compared to 90 days for a SNUN, therefore any potential loss of profits due to delays may be less than for a SNUN under Option 3.

In addition to the costs of submitting the equivalency determination request, each submitter will also incur costs to develop data to support the request. However, total costs of the equivalency option should be no more than the costs of complying with controls in the SNUR to avoid a significant new use -- for example, controls related to workplace protection or environmental release. Otherwise, presumably there would be no incentive for the submitter to choose this alternative. Finally, to produce the chemical following EPA review, the submitter would incur costs from recordkeeping and from any restrictions not waived (see Option 1).

2.5 Decide Not to Produce Chemical (Option 5)

Some firms may find that the costs of meeting the SNUR requirements and/or restrictions (Option 1) or preparing a SNUN or other submission (Options 2, 3, or 4) are financially unattractive. In these cases, the firm could choose not to manufacture, import, or process the PMN or MCAN substance.

While this option avoids the costs of meeting the specifications in the SNUR or submitting a request for some alternative, it entails the "hidden" cost of the profit that will be foregone as a result of not engaging in the commercial activity originally planned. For example, if the firm does not produce the SNUR substance, then it will forego the profit it would have achieved by producing it. That foregone profit is a potential "hidden" cost of Option 5. Similarly, if the firm would have used the SNUR substance in the production of another product and must substitute to a costlier substance, it will incur those additional costs of production. If the firm elects to produce for R&D purposes only, it may have costs associated with R&D recordkeeping attributable to the SNUR.

Firms that exercise Option 5 may still incur export notification costs, if they export any existing stockpiles of the product. This cost is quantified in Chapter 3 below.

2.6 Summary of Costs for Each Option

Table 2-1 gave an overview of compliance options. Table 2-3 through Table 2-6 summarized the quantified portion of potential costs of either following restrictions to avoid engaging in a Significant New Use, or of making a submission to EPA. Table 2-7 presented sample testing costs. Costs are for one chemical at one site, and – where volume is relevant – are based on standard assumptions that include 25 exposed workers per site and, for haz-comm costs, annual shipments of about 10,000 kilograms per site. Costs are not otherwise adjusted for the nature of the chemical or process, volume, location, or other firm-specific or chemical-specific factors.

As mentioned above, costs are estimated for one chemical at one site, not for aggregate production. Resources were not available to estimate aggregate costs. Among other factors, it is not known how many firms are affected by the SNURs. EPA receives a handful of Significant New Use Notices per year due to SNURs. However, if a SNUR chemical is on the TSCA Inventory, a firm may use the chemical in a way that avoids a Significant New Use (Option 1), and never make a submission. It is not known how many firms are affected but do not make a submission. Also, it is not known whether firms avoid the chemical altogether *specifically due to the SNUR*. However, at least for the years immediately following SNUR promulgation, these numbers are likely to be small. This is because the chemicals in this type of SNUR rulemaking are still relatively new – as Appendix A indicates, most were submitted to EPA as PMNs in the past four Federal fiscal years – and, in addition, often have confidential chemical identities.

- For firms manufacturing, importing, or processing within SNUR restrictions to avoid a Significant New Use (Option 1), quantifiable costs can range from about $515 (if the only added cost is for recordkeeping) to over $39,275 per chemical if the firm must add worker protection measures such as gloves, protective clothing, and respirators *that it would not otherwise use*. Most chemicals are also subject to costs that could be significant but are not quantified in this report, such as restrictions on releases to water or on other aspects of use.

- For submissions to EPA (Options 2, 3, and 4), the basic one-time submission cost is estimated at $26,854, including recordkeeping for the submission. For the SNUN (Option 3), EPA also collects a $19,020 fee.

- One objective of the rule is that EPA will be able to regulate prospective manufacturers, importers, or processors of a listed chemical substance before the described significant new use of that chemical substance occurs, provided that regulation is warranted pursuant to TSCA Sections 5(e), 5(f), 6 or 7. Consequently, after submitting a SNUN, the firm may need to comply with restrictions as a result of the SNUN review process, possibly leading to further costs similar to those in Option 1.

- Rarely, firms may choose to perform toxicity and/or environmental fate testing to support a SNUN (Option 3). Such testing is *not* mandatory. Costs for such testing are expected to be zero for most SNUNs and expected to be low for the few SNUNs for which a submitter might voluntarily perform such testing.

- Companies that might have manufactured, imported, or processed a chemical in the absence of the SNUR may incur "hidden" costs, such as loss of profits from delayed or foregone sales, if they avoid the chemical altogether (Option 5). These costs were not quantified.

- Companies may incur costs from more than one Option, for example if they temporarily produce in conformance with SNUR restrictions while submitting a SNUN and waiting the required 90 days plus any extensions.

For some firms, costs may be attributable to EPA's New Chemicals review process, but not to the SNUR itself. For example, a firm may already be bound by a TSCA Section 5(e) Consent Order following review of its PMN, so that the SNUR based on the 5(e) order imposes no added costs for that firm. As another example, in rulemakings where a SNUR chemical is not on the TSCA Inventory, firms that have

not yet submitted a PMN must submit one to EPA before commercial production/import, with or without the SNUR (see Section 2.3, SNUR "New" Chemicals).

If the SNUR reflects the PMN use scenario, and the PMN submitter would stick to the PMN uses even in the absence of a SNUR, then there would be no added costs for the PMN submitter attributable to the SNUR. Also, firms may also incur worker protection, haz-comm and other costs for reasons other than the SNUR, so that SNUR requirements may impose no added costs.[6]

[6] Earlier SNUR economic analyses calculated possible haz-comm, worker protection, testing, and other costs for each PMN chemical or MCAN microorganism (EPA 2007b, Tables 9, 10, D-4). The chemical-specific tables were dropped from a later SNUR economic analysis (EPA 2007a). They reflected SNUR requirements and "recommended" testing, but were not otherwise tailored to the particular situation, and so were unreliable predictors of actual SNUR costs.

3 Export Notification Costs

Under Section 12(b) of TSCA, exporters must notify EPA if they export or intend to export a chemical subject to various TSCA sections (40 CFR §707.60 through 75). For TSCA 5(a)(2) (the section under which EPA promulgates significant new use rules) and certain other TSCA sections, this is a one-time notification requirement[7] per destination country for each exporter of a chemical substance. After receiving a notification from a firm, EPA notifies the importing country and the United States State Department (40 CFR §707.70). To calculate the burden associated with making export notifications, EPA first estimated the average annual number of export notifications made by an exporter, in Section 3.1. EPA then derived the annual and per notification burden associated with preparing and submitting an export notification, in Section 3.2.[8]

EPA estimated the average burden associated with making a single notification, but did not estimate either the total number of exporters of a SNUR chemical or the number of notifications per SNUR chemical. This is because the SNURs apply to a variety of different chemicals with a variety of unrelated uses, manufactures, and processors, making it impractical within the resources available for this report to assess the potential number of exporters and importing countries per chemical.

Most underlying data in this section come from the 2012 TSCA Section 12(b) ICR, *ICR No.: 0795.14 [Information Collection Request for] Notification of Chemical Exports - TSCA Section 12(b) Supporting Statement for Request for OMB Review under the Paperwork Reduction Act* (EPA 2012), with updating for inflation.

3.1 Estimated Number of Annual Export Notifications per Exporter

EPA's 2012 TSCA Section 12(b) ICR estimated that the average exporter *making notifications* will make 13 notifications per year.[9] This includes notifications resulting from SNURs and notifications resulting from other TSCA activities. A notification is typically no more than one page per chemical/country combination, and one notification mailing often includes multiple chemicals and/or destination countries.[10]

The percent of notifications due to PMN SNURs is unknown, and it is also unknown how many notifications may result from this rulemaking, as not all manufacturers may choose to export a chemical, or they may make several notifications for a single chemical.

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[7] On November 14, 2006, EPA revised the export notification requirement for chemicals subject to TSCA §5(a)(2), 5(b), 5(e)(1) and 5(e)(2) from an annual to a one-time requirement per destination country for each exporter (, 71 FR 66234, 2006).

[8] Beginning with EPA (2009a), the cost per notification is presented as well as the cost for the average submitter making export notifications.

[9] EPA calculated the average number of export notifications per exporter in the 2012 TSCA Section 12(b) ICR (EPA 2012) by dividing the estimated number of submitted notifications (3,090) by the estimated number of exporters (240).

[10] Based on review by an EPA economist of notifications received under TSCA Sections 4, 5 and 6 over approximately three weeks in early 2010.

3.2 Exporter Costs

The 2012 TSCA Section 12(b) ICR (EPA 2012, p. 11, Table 3), estimated the annual export notification cost for an exporter under the one-time export notification requirement. These costs include the cost to the exporter of compiling a list of their products that are subject to TSCA Section 12(b) requirements, writing or revising an export notification letter to EPA, checking the outgoing shipments, and sending the notification letters with the associated shipping costs.

The per-notification cost was calculated based on the average burden per firm making notifications. Exporters making more notifications per year may benefit from economies of scale and have lower costs per notification; those making fewer notifications may have higher costs per notification.

3.2.1 Estimated Submission (Mailing) Costs

Regulated companies will incur mailing costs for export notifications delivered to EPA. Notifications are assumed shipped via the U.S. Postal Service (USPS) as first-class registered mail with a return receipt (USPS 2017). The estimated per-shipment and annual mailing costs incurred by individual submitters are detailed in Table 3-1.

Table 3-1: Derivation of Total Mailing Cost for 13 Notices

Postal Service[1]	**Cost**
Registered mail, *regular, with $0 declared value*	$11.70
Return receipt, *requested at time of mailing*[2]	$2.10
Postage, *regular First Class, up to 1 ounce*	$0.49
Cost per export notice - Subtotal	$14.29
	× 13
Total Mailing Cost for 13 Notices	$185.77

Notes:
[1] Mailing rates are from the US Postal Service web site as of May 2020 (U.S. Postal Service (U.S. PS) 2020).The mailing method comes from the *Economic Analysis of the Proposed Change to TSCA Section 12(b) Export Notification Requirements*, November 2005 (EPA 2005a), as clarified in a later SNUR economic analysis (EPA 2007a, Table 8).
[2] Starting with the *Economic Analysis of Expedited New Use Rule for Fifty-seven Chemical Substances EPA Docket EPA-HQ-OPPT-2016-0207* (EPA 2016) the cost for return receipts service is the average of a the cost of receiving a physical return receipt by mail and the cost of receiving an electronic return by email. Prior SNUR economic analysis only used the cost for a physical return receipt.

3.2.2 Compile and Maintain the List of Products

Since TSCA §12(b) information collection activity has been in place for over twenty years, most respondents will have already developed a list of their products subject to TSCA §12(b) export notification. Respondents need only check for new regulations promulgated and any new products exported by the company. Updating the list is estimated to take an average of one hour of technical time, which may also include some proportion of legal time (EPA 2012). The total burden can vary from two hours per year up to two hours per month, depending on the number of products exported by the company and the number of their products subject to TSCA §12(b) (EPA 2012).

The number of submitters per year who report under TSCA §12(b) has varied over time, rising from around 160 in 1991 to over 460 in 2000, and declining since. In the most recent TSCA §12(b) ICR, EPA estimated there would be approximately 240 submitters per year in near-future years (EPA 2012). Of these 240 submitters, EPA estimated that 160 companies were near the lower burden estimate of 2 hours

per year, and 80 companies were near the upper estimate of 24 hours per year. Compiling the list for all respondents was therefore estimated to take 2,240 hours (2 hours × 160 firms plus 24 hours × 80 firms), or an average of about 9.3 hours of technical time per firm per year for 13 notifications per year (EPA 2012).

3.2.3 Write or Revise Export Notification

Companies that export chemicals subject to TSCA §12(b) reporting must prepare an export notification to send to EPA when export shipments are made. Time for initial preparation of the export notice may vary depending on whether the company has prior experience with this requirement. This step is estimated to take an average of one hour of technical time (which may also include some proportion of legal time) per firm per year for 13 notifications per year (EPA 2012).

3.2.4 Check Orders and Send Notifications

Companies that export chemicals subject to TSCA §12(b) reporting must check outgoing shipments against the list of their products described above. A form letter notifying EPA and providing the required data must be printed and mailed within the required time period. This process is estimated to take an average one half hour of clerical time per export notification or 6.5 hours for 13 notifications (EPA 2012).

The burdens and associated costs for each notification activity are provided in Table 3-2.

Table 3-2: TSCA 12(b) Export Notification Cost per Notification

Cost Component	Technical			Clerical			Total	
	$/Hr	Hours	2020$	$/Hr	Hours	2020$	2020$	Hours
Compile list	$83.76	9.3	$779	--	--	--	$779	9.3
Write letter	$83.76	1	$83.76	--	--	--	$83.76	1
Check order and send notice	--	--	--	$35.84	6.5	$233	$233	6.5
Mailing cost[1]	--	--	--	--	--	--	$186	-
Total per facility[2]		**10.3**	**$863**		**6.5**	**$233**	**$1,282**	**16.8**
Total per notification		**0.79**	**$66.38**		**0.50**	**$17.92**	**$98.62**	**1.29**

Notes:
[1] Mailing costs reflect 2019 USPS rates and can be found in Table 3-1.
[2]An average facility *submitting notifications* is assumed to submit 13 export notifications per year.
Sources:
Appendix B of this report derives technical and clerical hourly labor costs. Other costs are from *ICR No.: 0795.14 [Information Collection Request for] Notification of Chemical Exports - TSCA Section 12(b) Supporting Statement for Request for OMB Review under the Paperwork Reduction Act* (EPA 2012, p.10), and are updated to 2019 dollars.

4 Agency Costs

This SNUR is expected to generate Agency costs for both SNUN review and processing, and export notification processing. Because it is unknown how many SNUNs and export notifications will be submitted as a result of this rulemaking, all Agency costs are estimated at the per-case level and are not aggregated to estimate the total Agency burden. Section 4.1 describes the burden to the Agency of reviewing and processing a single SNUN submission. Section 4.2 derives the Agency burden of processing and reviewing export notifications.

4.1 SNUN Processing Costs

EPA's cost to review and process SNUN submissions is assumed to be represented by its costs for a larger category of similar TSCA section 5 notices that includes SNUNs. On September 27, 2018, EPA finalized a fees rule under the Toxic Substances Control Act (TSCA), as amended in 2016 by the Frank R. Lautenberg Act Chemical Safety for the 21st Century Act. The final rule establishes new fees for actions under TSCA sections 4, 5, and 6 (83 FR 8212) to defray a portion of TSCA implementation costs. In developing the fees, EPA estimated its total annual costs for processing, reviewing, and making determinations under TSCA section 5 between fiscal years 2019 and 2021. EPA estimated its direct and indirect costs for reviewing PMNs, SNUNs, and Microbial Commercial Activity Notices (MCANs) to be $18,934,659 per year during this period, and assumed that an average of 462 PMNs, SNUNs, and MCANs will be submitted per year.[11] This yields an average Agency cost of approximately $41,000 apiece for reviewing and processing PMNs, SNUNs, and MCANs.[12] Thus, processing and reviewing any SNUNs submitted due to this SNUR is also expected to cost EPA approximately $41,000.

4.2 Export Notification Processing Burden

Under TSCA Section 12(b), exporters must notify EPA if they intend to export chemicals subject to SNURs, as described in Chapter 3 above. The Agency burden and cost due to TSCA §12(b) export notification result from three tasks. In the first task, EPA receives export notifications from companies that intend to export one of the chemicals subject to TSCA §12(b) (EPA 2012). In the second task, EPA staff prepares separate notification letters that are subsequently reviewed and delivered to importing countries, their embassies, or representatives, and to the importing country's U.S. embassies (EPA 2012). (See Table 3-1 for the cost of mailing one notification). The third task is comprised of EPA staff responses to public inquiries and other TSCA 12(b) activities. The work of responding to non-routine requests for information and clarification from industry and importing countries, and of handling other tasks associated with the TSCA §12(b) program, was estimated to require roughly 400 hours per year

[11] Table 9 - Annual Section 5 PMN/SNUN/MCAN Cost Estimates. *EO 12866 Documentation; Draft Submitted to OMB – Technical Background Document (RIN 2070-AK27; Proposed Rule*. EPA-HQ-OPPT-2016-0401-0020. https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0401-0020.

[12] This $41,000 review cost is lower than the overall average cost of $55,200 for TSCA section 5 activities that EPA calculated for the 2018 fees rule because the $55,200 value includes costs for activities (such as issuing SNURs following a PMN review, and reviewing Notices of Commencement) that are not relevant to SNUNs.

(EPA 2012). Since the current rulemaking covers only a very small percent of the chemicals subject to TSCA 12(b) reporting, a very small percent of such activity will be attributable to the current rulemaking.

Because it is unknown how many, if any, notifications EPA will receive or send as a result of the current rulemaking, the costs to the Agency are presented per activity.[13] The burden for the first two Agency activities is provided in Table 4-1 below. To estimate the Agency cost, hourly burdens are multiplied by the loaded wage rate of a GS-13, Step 5, which is derived in Appendix B.

Table 4-1: TSCA 12(b) Export Notification Cost: Agency Burden per Activity (2020$)

Agency Activity	Hours per Activity	FTE per Activity[1]	Loaded GS-13, Step 5 FTE Wage Rate	Mailing Cost	Total Agency Cost per Activity
	(a)	(b) = (a)/2,087	(c)	(d)	(e) = ((b)*(c))+(d)
Process notices from companies	0.1	0.000048	$186,160		**$8.94**
Process notices to importing countries	0.5	0.000240	$186,160	$14.29	**$58.97**

Notes:
[1] The burden associated with an Agency activity is the burden for the Agency to process one incoming notification, or to prepare and mail an outgoing notification
Sources:
Appendix B of this report derives Agency labor costs. Mailing costs are from Table 3-1 of this report. Other burdens are from ICR No.: 0795.14 [Information Collection Request for] Notification of Chemical Exports - TSCA Section 12(b) Supporting Statement for Request for OMB Review under the Paperwork Reduction Act (EPA 2012), updated for inflation.

[13] Beginning with EPA (2009a), the Agency cost per activity is presented, and not the entire Agency costs resulting from export notifications.

5 Additional Analyses

This chapter presents additional analysis of other potential impacts of this rulemaking, as required under various statutes and executive orders.

5.1 Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601 et. seq.), as amended by the Small Business Regulatory Enforcement Fairness Act, requires regulators to consider the impact of regulations on small entities, in particular small businesses. The requirement to submit a SNUN applies to any person (including small or large entities) who intends to engage in any activity described in the rule as a significant new use. Where a use is new, by definition no small or large entities presently engage in such activities. Although some small entities may decide to manufacture or process a substance for the new use after the SNUR is promulgated, EPA receives very few SNUNs, and few of those are submitted by small entities. In response to the promulgation of SNURs covering over 1,000 chemical substances, the Agency receives only a handful of SNUNs per year. For example, the number of SNUNs was four in Federal fiscal year 2005, eight in FY2006, six in FY2007, eight in FY2008, seven in FY2009, two in 2010, and ten in 2011 (EPA 2012), for an average of 6 per year from all SNURs. EPA has no reason to believe that this SNUR would alter the pattern of SNUN submissions that EPA has historically seen. In addition, the estimated reporting cost for submission of a SNUN is minimal regardless of the size of the firm, averaging about $23,834 including SNUN recordkeeping and reporting costs. The Agency currently offers some relief to qualifying small businesses by reducing the SNUN submission fee from $19,020 to $3,300. This lower fee reduces the cost of submitting a SNUN to about $11,164 for smaller firms. During the six-year period from 2005 to 2010, only three submitters self-identified as small in their SNUN submission[14] (EPA 2012). EPA believes the cost of submitting a SNUN is relatively small compared the cost of developing and marketing a chemical new to firm and that the requirement to submit a SNUN generally does not have a significant economic impact.

In response to a SNUR, firms could also decide to request an equivalency determination or a request for SNUR modification or revocation. The submission cost for these requests is about $7,834. EPA believes this cost to be low compared to the cost of developing and marketing a chemical new to the firm. The expected number of requests is also expected to be small. In general, EPA receives from zero to three modification/revocation requests per year due to SNURs; therefore, it is unlikely that a substantial number of small entities would be affected.

5.2 Unfunded Mandates Reform Act (UMRA)

EPA has determined that this regulatory action does not impose any enforceable duty, contain any unfunded mandate, or otherwise have any effect on small governments subject to the requirements of Sections 202, 203, 204, or 205 of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4).

[14] The three "small" submitters were identified by review of actual SNUN submissions from the years 2005-2010.

5.3 Paperwork Reduction Act (PRA)

According to the Paperwork Reduction Act (PRA), 44 USC 3501 et seq., an agency may not conduct or sponsor, and a person is not required to respond, to a collection of information that requires Office of Management and Budget (OMB) approval under the PRA, unless it has been approved by OMB and displays a currently valid OMB control number. The information collection requirements related to this action have already been approved by OMB pursuant to the PRA under OMB control number 2070-0012 (EPA 2007d). This action does not impose any additional burden requiring OMB approval.

5.4 Executive Order 12866, Regulatory Planning and Review

Executive Order 12866, *Regulatory Planning and Review,* requires OMB review for rules with an impact on the economy of $100 million or more, or with any other potential significant impact. OMB has previously determined that these types of SNURs are not a "significant regulatory action" that would require OMB review under this Executive Order.

5.5 Executive Order 13132, Federalism

Executive Order 13132, *Federalism* (64 FR 43255, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." This action will not have a substantial direct effect on States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, entitled Federalism (64 FR 43255, 1999).

5.6 Executive Order 12898, Environmental Justice

This action does not involve special considerations of environmental justice related issues as required by Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629, 1994).

5.7 Executive Order 13045, Protection of Children

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885, 1997), requires EPA to identify and assess environmental health and safety risks that may disproportionately affect children. This type of analysis is required for rules that will have an impact of $100 million or more only. The impact of these SNURs will be less than $100 million and therefore no analysis of such impacts on children is required.

5.8 Executive Order 13175, Tribal Governments

Executive Order 13175 is *Consultation and Coordination with Indian Tribal Governments* (59 FR 22951, 2000). This rule does not have Tribal implications because it is not expected to have substantial direct effects on Indian Tribes.

5.9 Executive Order 13211, Energy Supply, Distribution, or Use

This rule is not subject to Executive Order 13211, entitled *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use* (66 FR 28355,2001), because this action is not expected to affect energy supply, distribution, or use.

Appendix A: List of PMNs and their Chemical Names

Table A-1: PMNs Subject to the Rule Described in this Economic Analysis[1]

No.	PMN	Name[2]	CAS RN[2]
1	P-00-1085	Fluoroacrylate copolymer (generic)	
2	P-01-0584	Perfluoroalkylsulfonamidoalkyl acrylate, polymer with acrylic acid derivatives (generic)	
3	P-02-0016	Urethane polymer modified with perfluoroalkylsulfonamide (generic)	
4	P-02-0195	Urethane polymer modified with perfluoroalkylsulfonamide and polyethoxylate (generic)	
5	P-02-0609	Urethane polymer modified with perfluoroalkylsulfonamide (generic)	
6	P-02-0700	Copolymer of perfluoroalkylsulfonamidoalkyl acrylate and alkyl acrylate modified fatty acid dimers (generic)	
7	P-02-0891	Phosphonium, triphenyl(phenylmethyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	332350-93-3
8	P-02-0920	Alkane carboxylic acids esters with long chain fatty alcohol and fluorinated alkylsulfonamidoalkyl alcohol (generic)	
9	P-03-0032	Blocked fluorochemical urethane (generic)	
10	P-03-0033	Polyperfluoro alkylene glycol, perfluoroalkoxy- and hydroxy alkyl amido perfluoroalkyl terminated (generic)	
11	P-03-0067	Fluoroalkene substituted alkene polymer (generic)	
12	P-03-0077	Phosphonium, tributyl (2-methoxypropyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	
13	P-04-0174	Fluoroacrylate modified urethane (generic)	
14	P-04-0176	Fluorinated oligomer alcohol (generic)	
15	P-05-0075	Perfluoroalkylethyl methacrylate copolymer (generic)	
16	P-05-0107	Perfluoroalkylethyl methacrylate copolymer organic acid salt (generic)	
17	P-04-0289	Ethylene-tetrafluoroethylene-fluorinated alkene copolymer (generic)	
18	P-04-0537	Fluorochemical ester (generic)	
19	P-05-0491	Fluoroalkylacrylate copolymer (generic)	
20	P-05-0492	Fluoroalkylacrylate copolymer (generic)	
21	P-05-0503	Fluorochemical urerthane (generic)	
22	P-05-0504	Fluoroalkylacrylate copolymer (generic)	
23	P-05-0505	Fluoroalkylacrylate copolymer (generic)	
24	P-05-0838	Fluoroalkylacrylate copolymer (generic)	
25	P-06-0206	Fluoroalkyl acrylate (generic)	
26	P-06-0207	Fluoroalkylacrylate copolymer (generic)	
27	P-06-0208	Fluoroalkylacrylate copolymer (generic)	
28	P-06-0211	Fluoroalkylacrylate copolymer (generic)	
29	P-06-0212	Fluoroalkylacrylate copolymer (generic)	
30	P-06-0213	Fluoroalkylacrylate copolymer (generic)	
31	P-06-0214	Fluoroalkylacrylate copolymer (generic)	
32	P-06-0215	Fluoroalkylacrylate copolymer (generic)	
33	P-06-0216	Fluoroalkylacrylate copolymer (generic)	
34	P-06-0217	Fluoroalkylacrylate copolymer (generic)	
35	P-06-0224	Fluoroalkylacrylate copolymer (generic)	

Notes:
[1] The PMN number reflects the Federal Fiscal Year and sequence of submission. For example, those starting "P-16" were submitted in the twelve months in Fiscal Year 2016, October 1st 2015 – September 30, 2016.
[2] If a CAS RN is identified as "N/A" meaning "Not available" and/or the chemical name is indicated to be "generic" then the chemical identity is indicated to be confidential.

Appendix B: Inflators and Wage Rates

This appendix describes the derivation of the fully loaded labor rates and inflation factors used in calculating costs of labor, materials, and other inputs. Costs for this report are for September 2020.

B.1 Derivation of Loaded Wage Rates

Unit labor costs are calculated by adding fringe benefits and overhead to the wage or salary to derive a fully loaded labor cost. The basic method is described in *Wage Rates for Economic Analysis of the Toxics Release Inventory Program* (EPA 2002). The resulting loaded labor rates are given in Table B-1. Costs are calculated for several labor categories: Managerial, Professional/ Technical, Clerical, Production Workers, Industrial Hygienists, and EPA staff.

In March 2004, BLS began using the North American Industry Classification System (NAICS) codes instead of the Standard Industrial Classification (SIC) System, and the Standard Occupational Classification (SOC) system instead of the Occupational Classification System (OCS). The following table shows the crosswalk between old and new occupational titles.

EPAB Reports Labor Category	BLS Old Title (OCS)	BLS New Title (SOC)
Managerial	Executive, administrative, and managerial	Management, business, and financial
Professional/Technical	Professional specialty and technical	Professional and related
Clerical	Administrative support, including clerical	Office and administrative support

Source:
Employer Costs for Employee Compensation: Changes to NAICS and SOC, Table 2. ECEC Occupational Comparability between SOC and OCS (BLS 2006b); and Weinstein (2004).

B.2 Derivation of Labor Rates for Managerial, Professional/Technical, Clerical, and Production Labor

Wages and fringe benefits for managerial, professional/technical, clerical and production labor were taken from the Bureau of Labor Statistics (BLS) *Employer Costs for Employee Compensation* (ECEC) data,[15] for September 2020, for manufacturing industries.[16]

[15] This follows the approach introduced in *Economic Analysis of Expedited Significant New Use Rules for 65 Chemical Substances: EPA Docket OPPT-2003-0063* (EPA 2007b). In earlier PMN SNUR economic analyses, such as EPA (2003), wage rates for production workers came from the BLS *National Employment, Hours, and Earnings, Average Hourly Earnings of Production Workers,* while fringe benefits were taken from the ECEC data. Here, as in EPA (2007b), both wages and fringes for production workers come from ECEC data, for better consistency with the method of estimating labor costs for other labor categories.

[16] Employer Costs for Employee Compensation Supplementary Tables September 2020 (U.S. Bureau of Labor Statistics (BLS) 2020b). This follows the approach introduced in EPA (2007b). Earlier PMN SNUR economic analyses, such as EPA (2003), used ECEC data for "All Goods Producing" sectors (manufacturing, mining, and construction). However, the manufacturing sector data seem more relevant since the SNURs mainly affect the chemicals industry.

The cost of fringe benefits such as paid leave and insurance, specific to each labor category, are taken from the same ECEC series. Fringe benefits as a percent of wages are calculated separately for each labor category.[17]

An overhead rate of 20% is used based on assumptions in Handbook on Valuing Changes in Time Use Induced by Regulatory Requirements and Other U.S. EPA Actions (U.S. Environmental Protection Agency (EPA) 2020). This overhead loading factor is added to the benefits loading factor, and the total is then applied to the base wage to derive the fully loaded wage.

Fully loaded costs for managerial, clerical, and production labor are shown in Table B-1.

B.3 Derivation of Labor Rates for Industrial Hygienists

For industrial hygienists, wages were based on another BLS data series, *Occupational Employment Statistics (OES), National Industry-Specific Occupational Employment and Wage Estimates.* OES data were used because ECEC data were not available for very specific occupations. However, the OES data covers only wages, not fringe benefits. Therefore, the Industrial Hygienist fringe benefits continue to be based on ECEC data.[18]

The wage rate for Industrial Hygienists is a weighted average of the hourly mean wage for *Occupational Health and Safety Specialists,* Standard Occupational Classification (SOC) 29-9011, and *Occupational Health and Safety Technicians,* SOC 29-9012, in Manufacturing. The wage rate for each occupation was weighted by employment for the occupation. The North American Industry Classification System (NAICS) codes for Manufacturing are 31, 32, and 33 (BLS 2017b). The calculations are shown in Table B-2.

As with other labor categories, the fringe benefits factor came *Employer Costs for Employee Compensation* (ECEC) data, for September 2020. Benefits for "professional and related" occupations were used, and loaded wages were calculated as for other types of labor. An additional loading factor of 20 percent of wages was applied for overhead. Calculations are shown in Table B-2.

[17] This follows terminology introduced in EPA (2007b). Earlier SNUR economic analyses used the term "technical" labor. Here the category is called "professional/technical" labor, to make clear how it relates to BLS categories. In 2004, BLS changed from the Occupational Classification System, OCS, to the Standard Occupational Classification system, SOC. In the process, the "Professional specialty and technical" category became the "Professional and related" category. However, the coverage of the old and new occupational groups is approximately the same. See the BLS article, C*omparing Current and Former Industry and Occupation ECEC Series* (Weinstein & Loewenstein 2004).

[18] This follows the approach for calculating Industry Hygienist wages introduced in EPA (2007b) and is a change from the method used in earlier PMN SNUR economic reports such as EPA (2003), which used data from a 1997 professional journal salary survey.

B.4 Derivation of Labor Rates for EPA Staff

Agency labor costs are calculated based on annual Federal salaries for the Washington-Baltimore area published by the Office of Personnel Management for 2019 (U.S. Office of Personnel Management 2019; U.S. Bureau of Labor Statistics (BLS) 2020b). The average salary for one Full Time Equivalent (FTE) staff is estimated as the salary for a GS-13 Step 5 employee.[19]

Multiplying the annual pay by an assumed loading factor of 1.6 to reflect Federal fringe benefits and overhead, the loaded annual salary of EPA staff was calculated to be $186,160.

The Agency loading factor is from an EPA guide, *Instructions for Preparing Information Collection Requests (ICRs)* (EPA 1992, p. 30, footnote 9). The 60 percent assumption was labeled "the benefits multiplication factor" in the EPA Guide, but has been used in many EPA Office of Pollution Prevention and Toxics ICRs to reflect both fringe benefits and overhead for Federal staff. For example, it was used in an August 2000 document supporting ICR No. 1139.06 (EPA 2000), with the following explanation:

> The annual costs per FTE are derived by multiplying the annual pay rate by 1.6 (the benefits multiplication factor). The multiplication factor used is recommended in EPA's Office of Policy, Planning, and Evaluation's Instructions for Preparing Information Collection Requests (ICRs) (June 1, 1992). An EPA internal phone call between Carol Rawie (OPPT/EETD/RIB) and Carl Koch (OPPE/RMD/IMB) on May 3, 1994, indicated that the 1.6 factor included not only benefits but also overhead.

[19] The GS-13 Step 5 is consistent with ICR No. 0574.14 (12/18/2007) (EPA 2007b), which covers PMN SNURs. Use of this grade level follows the approach introduced in EPA, (2007b). That report represented a change from an earlier PMN SNUR economic analysis (EPA 2003), which used an average of GS-12 Step 1 and GS-12 Step 10 salaries.

Table B-1: Derivation of Loaded Wage Rates

EPAB Labor Category	Data Sources	Date	Wage	Fringe Benefit	Total Compen-sation	Overhead % Total Compensation[1]	Fully Loaded Wages
			(a)	(b)	(c) = (a) + (b)	(d)	(e)=(c) x (1+(d))
Managerial	BLS *ECEC*, Private Manufacturing industries, "Mgt, Business, and Financial"[2]	Sep-20	$52.01	$22.93	$74.94	20%	$89.93
Professional/ Technical	BLS *ECEC*, Private Manufacturing industries, "Professional and related"[2]	Sep-20	$46.57	$23.23	$69.80	20%	$83.76
Clerical	BLS *ECEC*, Private Manufacturing industries, "Office and Administrative Support" [2]	Sep-20	$19.67	$10.70	$29.87	20%	$36.44
Production Worker	BLS *ECEC*, Private Manufacturing industries, "Production, transport, and material moving." [2]	Sep-20	$52.01	$22.93	$30.37	20%	$89.93
Industrial Hygienist	Wage*: BLS OES National Industry-Specific Employment and Wage Estimates*, average of wages for *Occup. Health/ Safety Specialists* (SOC 29-9011) and *Occup. Health/Safety Technicians* (SOC 29-9012), weighted by employment. [3] Fringes: BLS *ECEC*, Private Manufacturing industries, "Professional and related" [2]	Wage: May-19, Fringe: Sep-20	$35.12	--	$52.64	20%	$63.17
EPA staff FTE	Annual Federal staff cost: OPM Washington-Baltimore-Northern Virginia, DC-MD-PA-VA-WV, area, GS-13 Step 5 pay rates, with 60% overhead.[4]	2020	$55.75	--	[Included in 60% overhead]	60%	$186,160

Notes:

[1] An overhead rate of 20% is used based on assumptions in Handbook on Valuing Changes in Time Use Induced by Regulatory Requirements and Other U.S. EPA Actions (U.S. Environmental Protection Agency (EPA) 2020) .

[2] *Employer Costs for Employee Compensation Supplementary Tables September 2020 (U.S. Bureau of Labor Statistics (BLS) 2020c, 2020b).*

[3] Employment and unweighted wages are from BLS *Occupational Employment Statistics (National Industry-Specific Employment and Wage Estimates)*, May 2019 (U.S. Bureau of Labor Statisitics (BLS) 2019b,U.S. Bureau of Labor Statisitics (BLS) 2019a). See Table B-2 for derivation.

[4] The salary is unloaded Federal GS-13 Step 5 salary for calendar 2020, from the Office of Personnel Management salary table for Washington-Baltimore-Northern Virginia (U.S. Office of Personnel Management 2019). The 60% fringes-and-overhead rate is from an EPA guide, *Instructions for Preparing Information Collection Requests* (ICRs) (EPA 1992, p. 30, footnote 9).

Table B-2: Derivation of Industrial Hygienist Wage Rate (NAICS 31, 32, 33)

Occupation Title (SOC Code)	Employment	Mean Hourly Wage (2020$)	Weight	Weighted Wage (2020$)
	(a)	(b)	(c)	(d) = (c) × (b)
Occupational Health & Safety Specialists (29-9011)	16,420	$37.51	0.783	$29.37
Occupational Health & Safety Technicians (29-9012)	4,550	$26.48	0.217	$5.75
Industrial Hygienist (weighted average)	20,970	--	1	**$35.12**

Sources:
Employment and unweighted wages are for manufacturing (NAICS 31, 32, 33) from BLS *Occupational Employment Statistics (Occupational Employment and Wages)*, for May 2019 (U.S. Bureau of Labor Statisitics (BLS) 2019c).

B.5 Derivation of Inflation Factors

Costs of equipment and supplies were inflated using the Consumer Price Index – All Urban Consumers; wages were inflated using the appropriate Employment Cost Index (ECI). Where both labor and equipment/supplies were involved, we used the inflation factor corresponding to the dominant cost category.[20] For example, test costs include a mix of labor, equipment, and supplies. Assuming that the largest component of test costs comes from labor, we used the ECI for private industry, all workers. Complete information on the derivation of the inflation factors used is given in Table B-3 below.

In 2006, the Bureau of Labor Statistics (BLS) made several changes to the Employment Cost Index. The changes are described on a BLS web page, "Change has come to the ECI," (BLS 2006a) and in several April 2006 *Monthly Labor Review* articles posted on the BLS web site: "Changes affecting the Employment Cost Index: an overview" (Caroll 2006); "Employment Cost Index Publication Plans" (Sleemi 2006); and "Seasonal adjustment in the ECI and the conversion to NAICS and SOC" (Branch et al. 2006).

Under a mandate from OMB, BLS changed its classification of industries and occupations from the Standard Industrial Classification (SIC) and Occupational Classification System (OCS) to the North American Industry Classification System (NAICS) and Standard Occupational Classification (SOC) system. In 2006, BLS adjusted all ECI series to reflect this change.

[20] Prior SNUR economic analyses used the seasonally adjusted ECI for the total compensation, private industry white collar workers (Series ID CIS2010000W00000I) to inflate export notification and Agency extramural cost. However, in 2008 BLS retired both the "white-collar" and "blue-collar" series (BLS 2008, p. BLS-45). Therefore, beginning EPA (2009a), the "white-collar" series was replaced with the not seasonally adjusted ECI for total compensation of private industry professional and related workers (Series ID CIU2010000120000I). The "professional and related workers" series was chosen because it is the only series with continuous data since 1985, and the majority of export notification and Agency extramural activities are performed by professional and technical labor.

In addition to changing the industry and occupational classification systems, in 2006, BLS rebased the ECI from June 1989 = 100 to December 2005 = 100 for *all* current and historical non-seasonally adjusted series, including the NAICS and SIC based series. (Seasonally adjusted indices, including those in Table B-3 of this report, may not exactly equal 100 for December 2005 as a result of the seasonal adjustment. Seasonal adjustments are explained in Branch et. al, 2006.)

According to BLS, the official ECI for the years 1975 to 2005 is the SIC-OCS based series, and for subsequent years, the official ECI is the NAICS-SOC based series (Sleemi 2006, p.8).[21]

"Starting year" indices in Table B-3 continue to be SIC-SOC based. Current year indices are NAICS-SOC based. We use indices from both the NAICS-SOC and the SIC-OCS based ECI series because neither series spans the entire period over which testing and other costs need to be inflated.

[21] BLS has been publishing the NAICS-SOC based ECI series since March 2001 and it became official in March 2006. The SIC-OCS based series and NAICS-SOC series have different series ID numbers, even when they describe essentially the same population. For example, the series ID for seasonally adjusted total compensation for all private industry workers is ECS10002I for the SIC-OCS series and CIS2010000000000I for the NAICS-SOC series.

Table B-3: Derivation of Inflation Factors

Item	Inflation Index Source[1]	Starting Year	Index for Starting Year (a)	Index for 2019 (b)	Inflation Factor (b)/(a) [2]
Chemical testing (toxicity, ecological effects etc.) *White collar/other labor mix; equipment; supplies.* *Tests were first costed out in various years, depending on the test; inflation factors vary depending original cost date.*	BLS ECI, SA, Total comp, Private industry, All Workers, 4th Q (U.S. Bureau of Labor Statistics (BLS) 2020d)	varies	varies	141.8	varies
	Example for item costed in 1993	1993	66.5	141.8	2.132
	Example for test costed in 2000	2000	83.8	141.8	1.692
Impermeability testing of gloves and other gear[3]	BLS ECI, SA, Total comp, Private industry, All Workers, 4th Q (U.S. Bureau of Labor Statistics (BLS) 2020d)	1997	74.9	141.8	1.893
Agency Extramural Costs *White collar labor; equipment; supplies*	BLS ECI, SA, Total comp, Private industry, All Workers, 4th Q (U.S. Bureau of Labor Statistics (BLS) 2020d)	1993	67.0	141.8	2.116
Labels	BLS CPI, All urban consumers, not SA. CUUR0000SA0, Annual (U.S. Bureau of Labor Statisitics (BLS) 2020)	2011	225.672	260.065	1.152
Placards, respirators	BLS CPI, All urban consumers, not SA. CUUR0000SA0, Annual (U.S. Bureau of Labor Statisitics (BLS) 2020)	2014	236.736	260.065	1.099

Notes:

[1] In 2006, Bureau of Labor Statistics (BLS) Employment Cost Index (ECI) series "were rebased to December 2005 = 100 from June 1989 = 100." The change is reflected in the indices in this table and explained on the BLS website, *Employment Cost Index News Release Text: Employment Cost Index, March 2006* (BLS 2006c). The Consumer Price Index (CPI) was not rebased.
"Starting year" ECI indices are SIC-OCS based: Seasonally Adjusted (SA) ECS10002I for private industry All Workers, and not SA ECU11122I for private industry Professional and Related Workers (U.S. Bureau of Labor Statistics (BLS) 2018, 2020d).
After 2006, ECI indices are NAICS-SOC based: Seasonally Adjusted (SA) CIS2010000000000I for private industry All Workers, and not SA CIU2010000120000I (B) for private industry Professional, and Related workers (U.S. Bureau of Labor Statistics (BLS) 2018, 2020d).
[2] BLS CPI values were published with one decimal place through 2006 and with three decimal places after that.
[3] EPA began using the ECI for Private Industry All Workers in EPA (2007b), to better reflect the labor mix for impermeability testing. Earlier PMN SNUR economic analyses used the ECI for Private Industry White Collar Workers.

Appendix C: Costs of Hazard Communication, Worker Protection, and Recordkeeping Requirements

Section 2.1 of the main text of this report discusses costs of worker protection, hazard communication (haz-comm), and recordkeeping for SNURs. This appendix presents dollar costs and labor hours of these requirements, for one chemical at one site. Some requirements listed here may not be cited in the current rulemaking, but have been cited in past SNUR rulemakings.

Worker protection costs reflect the annualized costs of providing required personal protective equipment (PPE, i.e., gloves, goggles, clothing, or respirators), assessing dermal protection needs associated with the chemical, and performing required impermeability testing, and/or evaluating manufacturer's information. Finally, the annual recordkeeping costs include labor, photocopying, and record storage costs.

The haz-comm costs reflect the annual costs of updating the written program, labeling for chemical distribution and storage, creating and distributing material safety data sheets (MSDS), and employee training.

To estimate the costs of worker protection, haz-comm, and recordkeeping requirements, a number of assumptions were made, based on the original EPA analysis for generic SNUR provisions, *Economic Analysis of Final Significant New Use Rule: General Provisions for New Chemical Followup* (EPA 1989). In that report, EPA estimated that the number of workers exposed to any one substance would range from 10 to 25, and that a worker potentially would be exposed to a substance for a minimum of 50 days per year to a maximum of 250 days per year. The current analysis uses the high ends of those two ranges. Thus, each site is assumed to have 25 chemically-exposed workers requiring training and/or protective equipment, with each of them assumed to be exposed for 250 days per year.

Labor costs are derived from the United States Bureau of Labor Statistics sources as described in Appendix B. Material costs were primarily obtained from a national industrial equipment supply website (Grainger 2014; 2017).

Costs of worker protection, haz-comm, and recordkeeping are discussed in Sections C.1, C.2 and C.3, respectively. Table 2-6 in the main text summarizes these costs by SNUR requirement.

C.1 Protection in the Workplace

The following section estimates costs of assessing needs for dermal protection and evaluating protective gear for impermeability, as well as the costs of gloves, goggles, protective clothing, and respirators.

C.1.1 Dermal Protection Selection

If the SNUR cites 40 CFR §721.63(a)(1), then to avoid engaging in a Significant New Use, the employer must ensure that each person who is likely to experience dermal exposure to a PMN chemical is provided with and is required to wear personal protective equipment (e.g., gloves) that will prevent dermal exposure to the substance. The equipment must be selected and used in accordance with 29 CFR §1910.132 and §1910.133 (promulgated by OSHA). The selection and administration of this dermal protection is estimated to require 10 hours of labor by an industrial hygienist, annually (EPA 1999). The wage rate of the hygienist was calculated as described in Appendix B. The cost calculations for the dermal protection selection requirement are given in Table C-1 This covers only costs of selecting the dermal protection needed, not costs of the

items themselves. For costs of purchasing dermal protective items, see the sections below on costs of gloves, eyewear, and clothing.

Table C-1: Annual Costs for Dermal Protection Selection (40 CFR §721.63(a)(1))

Cost Element	Unit Cost (2020$)	Hours	Total Cost
Industrial Hygienist (IH) time	$63.17 per hour	10	**$632**
Sources: Labor rates, Table B-1; cost elements and quantities, EPA (1999).			

C.1.2 Impermeability Testing

As part of the workplace protection requirements specified under 40 CFR §721.63(a)(3), to avoid engaging in a Significant New Use, the SNUR may require that employers demonstrate that each item of protective equipment provided (e.g., gloves) provides an impervious barrier, to protect employees from dermal exposure. Requirements outlined in §721.63(a)(3) are provided in two parts, §721.63(a)(3)(i) and (ii). The employer may use a combination of (i) testing and/or (ii) evaluating manufacturer specifications. The following discussion is based on the *Economic Analysis of Expedited Significant New Use Rules for 168 Chemical Substances* and *Background Support Document for Economic Analysis of Significant New Use Rules* (EPA 1998) and assumes that the manufacturer uses both testing and evaluation of manufacturer specifications. The analysis assumes that costs are incurred annually.

The first step, described at 40 CFR §721.63(a)(3)(i), is to perform actual impermeability testing. To determine the costs of impermeability testing compliance, Best Manufacturing Company, a leading manufacturer and tester of chemical resistant articles, was consulted (Best 1997).

As described in EPA (1998), Best used one of two methodologies for impermeability testing. In the first method, chemical samples were submitted to Best with a specific article to be tested for impermeability. This method was cheaper, costing $200 (1997 dollars) per chemical, but the burden of finding an appropriate article of protection lay with the chemical manufacturer. In the second method, the chemical manufacturer simply submitted chemical samples to Best, who in turn determined the most appropriate product, even if a competitor manufactured the product. This method was costlier, at $800 (1997 dollars) per chemical.

The second method of impermeability testing is favored in this analysis for several reasons. First, the burden of finding and submitting an article of protection is shifted from the chemical manufacturer to the testing company, who would have greater experience in Personal Protective Equipment (PPE) selection. Second, should the article submitted fail the impermeability test, other articles may have to be submitted until satisfactory test results are obtained. Furthermore, substances subject to SNURs may include new and/or rare chemicals, which may have undiscovered or unknown properties. This uncertainty may impede chemical manufacturers' ability to effectively submit appropriate PPE articles for testing. Finally, the first method is essentially a pass-fail test. If an article passes the impermeability test, then it is acceptable. In the second method, several articles may be tested and compared, and, while one or more acceptable articles may result, the most impermeable article is always determined for the chemical. To obtain the *best* article rather than merely a satisfactory article of protection, the second method of testing is more appropriate. For these

reasons, unit costs of $800 per chemical (1997 dollars) are assumed for impermeability testing. The cost of the impermeability testing is assumed to be driven by labor costs of the company performing the testing, thus test costs were inflated with an Employment Cost Index as described in Appendix B. The administration of this test would also require two hours of industrial hygienist labor (EPA 1999).

The second step to comply with the workplace protection requirements at §721.63 (a)(3)(ii) is the evaluation of specifications from the manufacturer or supplier of the protective equipment. This requirement helps ensure that the protective equipment will be impervious to the PMN chemical(s). The evaluation of manufacturer specifications requires an estimated four hours of industrial hygienist labor.

Annual costs of the impermeability testing requirements are presented in Table C-2.

Table C-2: Annual Costs of Impermeability Testing (40 CFR §721.63(a)(3))

Cost Element	Unit Cost (1997$)		Inflation Factor	Unit Cost (2020$)		Hours	Total Cost[1]
Impermeability Testing (§721.63(a)(3)(i))							
Impermeability Test	$800	per chemical	1.893	$1,514	per chemical		$1,514
Industrial Hygienist time	--		--	--	$63.17	2	$126
					Subtotal	**2**	***$1,6405***
Evaluation of Manufacturer's Specifications (§721.63(a)(3)(ii))							
Industrial Hygienist time	--		--	$63.17	per hour		$253
					Subtotal		***$253***
TOTAL						**6**	**$1,893**

Sources:
1997 costs, Best (1997); cost elements and quantities, EPA (1998) and EPA (1999); inflators and labor rates, Table B-1 through Table B-3.

C.1.3 Gloves

If the SNUR cites 40 CFR §721.63(a)(2)(i), then gloves must be worn to avoid engaging in a Significant New Use. Gloves may also be acquired as a result of the dermal protection selection at §721.63(a)(1). If standard, disposable medical-grade gloves are used, they are assumed to be worn and discarded by the worker following each day of exposure. Each site is assumed to have 25 workers, each of them exposed 250 days per year. This reflects the high-side assumptions in EPA (1989, p. 25) for the number of workers and exposure days. Each pair was estimated to cost $0.30 (Grainger 2017). Total annual costs of providing disposable gloves are developed by applying the assumptions above regarding the number of workers exposed (25 per site) and frequency of replacement (one pair per worker per day of exposure, 250 days of exposure per year). For some chemicals, heavy-duty gloves may be used. They are generally not disposed of daily, but are more expensive. The estimated costs of gloves purchased in compliance with SNUR Personal Protective Equipment requirements are presented below in Table C-3. The cost estimates for each chemical assume that the more expensive heavy-duty gloves are used in cases where the SNUR explicitly requires gloves.

Table C-3: Annual Cost of Gloves (40 CFR §721.63(a)(2)(i))

Cost Element	Unit Cost (2017$ per pair)[1]	Number of Pairs Required[2]	Total Cost (2020$)
Disposable nitrile gloves (replaced daily)	$0.30	6,250	**$1,875**
Heavy duty butyl gloves (replaced every 25 work days)	$71.50	250	**$17,875**

Notes:
[1] It is assumed that catalog prices did not change from end of year 2016 to March 2017, when prices were obtained.
[2]The analysis assumes that 25 workers who are exposed 250 days/year replace disposable gloves daily and replace heavy duty gloves every 25 work days.

Sources:
Item costs, Grainger (2017); item type and quantity, EPA (1998); inflator, Table B-3.

C.1.4 Eyewear

If the SNUR cites 40 CFR §721.63(a)(2)(iii), then to avoid engaging in a Significant New Use, employer must provide eye protection. Eye protection may also be acquired as a result of the dermal protection selection at §721.63(a)(1). Protective goggles are expected to be used at a rate of one set per worker and replaced every four months. Each site is assumed to have 25 workers, each of them exposed 250 days per year. The SNUR may not specify the exact type of eyewear required. OSHA guidelines in 29 CFR §1910.133(b)(1), however, state that protective eye and face devices must comply with any of the following consensus standards: ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, or ANSI Z87.1-1989 (R-1988). A standard pair of goggles that meets the ANSI Z87.1-1989 specification was priced at $5.08 per pair, assuming that the company would opt for the least expensive goggles that meet any of the standards (Grainger 2017). A price estimate for a heavy-duty pair of chemical splash/impact resistant goggles compliant with ANSI Z87.1-2003 is also included in Table C-4.

The cost estimates for each chemical assume that the more expensive heavy-duty goggles are used in cases where the SNUR explicitly requires goggles. Costs of protective eyewear were inflated as described in Appendix B and are presented in Table C-4.

Table C-4: Annual Cost of Protective Eyewear (40 CFR §721.63(a)(2)(iii))

Cost Element	Unit Cost (2017$ per pair)[1]	Number of Pairs Required[2]	Total Cost (2020$)
Standard Goggles	$5.08	75	**$381**
Heavy duty chemical-splash/impact goggles	$15.21	75	**$1,141**

Notes:
[1] It is assumed that catalog prices did not change from end of year 2016 to March 2017, when prices were obtained.
[2]The analysis assumes 25 workers replacing goggles three times per year.
Sources:
Item costs, Grainger (2017); item type and quantity, EPA (1998).

C.1.5 Clothing

If the SNUR cites 40 CFR §721.63(a)(2)(ii) or (iv), then to avoid engaging in a Significant New Use, employers must provide protective clothing. Protective clothing may also be acquired as a result of the dermal protection selection at §721.63(a)(1). Both protective covering (§721.63(a)(2)(iv)) and full-body

chemical protective clothing (§721.63(a)(2)(ii)), are assumed to last four months. Each site is assumed to have 25 workers, each of them exposed 250 days per year.

The cost for standard collared chemical-resistant coveralls, is estimated at $22.51 each in 2017 (Grainger 2017), as shown in Table C-5 below. The cost for full-body protective clothing is based on the price of hooded chemical-resistant coveralls.

Table C-5: Annual Cost of Protective Clothing (40 CFR §721.63(a)(2))

Cost Element	Unit Cost (2017$ per set)[1]	Number Required[2]	Total Cost (2020$)
Coverall with hood (full-body clothing) §721.63(a)(2)(ii)	$46.19	75	**$3,464**
Coverall §721.63(a)(2)(iv)	$22.51	75	**$1,688**

Notes:
[1] It is assumed that catalog prices did not change from end of year 2016 to March 2017, when prices were obtained.
[2]The analysis assumes 25 workers replacing coverall three times per year.
Sources:
Item costs, Grainger (2017); item type and quantity, EPA (1998).

C.1.6 Respirators

For some PMN chemicals, to avoid engaging in a Significant New Use, the SNUR requires either the use of respirators or compliance with a New Chemical Exposure Limit (NCEL). Both requirements differ by chemical. For costing purposes, this analysis assumes that respirators are used. Costs of the SNUR respirator choices were estimated based on the costs of the respirator in §721.63(a)(5) that appeared to best match the SNUR descriptions.

Table C-6: Crosswalk Between SNUR Text and Respirator Types at 40 CFR §721.63(a)(5)

Respirator types at 40 CFR §721.63(a)(5) [1]	Requirement Stated in SNUR (exact SNUR wording may differ)
(ii) Category 19C Type C supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting facepiece. *Some SNURs may specify "full" facepiece* *Some SNURs may specify "or other positive pressure mode"*	Supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting full facepiece. Supplied-air respirator operated in pressure demand or other positive pressure mode and equipped with a tight-fitting full facepiece
(iii) Category 19C Type C supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a hood or helmet or tight-fitting facepiece. *Some SNURs may specify "half" or "full" facepiece.*	Supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a hood or helmet or tight-fitting facepiece (either half- or full-face).
(iv) Category 21C air-purifying respirator equipped with a full facepiece and high efficiency particulate filters. *Some SNURs may specify a "half" or "full" facepiece.* *Some SNURs may specify "if oil aerosols absent" or other restrictions related to oil aerosols.*	Air-purifying respirator equipped with a tight-fitting full facepiece and High Efficiency Particulate Air (HEPA) filters. Air-purifying, tight-fitting respirator equipped with N100 (if oil aerosols absent), R100, or P100 filters (either half- or full-face). Air-purifying, tight-fitting respirator (either half- or full-face) equipped with N100 (if oil aerosols absent), R100 (restricted use when oil aerosols present), or P100 (appropriate when oil aerosols present) filters. Air purifying, tight-fitting full-face respirator equipped with the appropriate combination cartridges tested and approved for the gas/vapor substance (i.e., organic vapor, acid gas, or substance-specific cartridge), with a particulate filter (N100 if oil aerosols are absent, R100, or P100).
(v) Category 21C powered air-purifying respirator equipped with a tight-fitting facepiece and high efficiency particulate filters. *Some SNURs may specify a "half" or "full" facepiece.*	Powered air-purifying, tight-fitting full-face respirator equipped with N100 (if oil aerosols absent), R100, or P100 filters. Powered air-purifying respirator equipped with a tight-fitting facepiece (either half- or full-face) and HEPA filters.
(vi) Category 21C powered air-purifying respirator equipped with a loose-fitting hood or helmet and high efficiency particulate filters.	Powered air-purifying respirator equipped with a loose-fitting hood or helmet and High Efficiency Particulate Air (HEPA) filters.

Note:

[1] The table specifies respirator types at 40 CFR §721.63 (a)(5) that are most similar to the equipment described in the SNUR text for the current and recent SNUR rulemakings. Any significant differences between the specified respirator type at 40 CFR §721.63 (a)(5) and the SNUR text respirator type are noted in italics.

Table C-7 gives average costs of various respirator types, as originally estimated in 2014, and inflated to 2019 dollars. It also estimates costs per plant site for a chemical requiring respirators.

The respirators specified in the SNURs are typically comprised of a respirator unit and any number of the following: special cartridges (such as high efficiency particulate filters, organic vapor cartridges, and paint, lacquer, and enamel filters), hoods or helmets, and filter caps. The costs for each site of providing respirators to chemically-exposed workers, shown in Table 2-4 of this economic analysis, are calculated based on the assumptions that (1) there are 25 chemically-exposed workers requiring protective equipment, (2) respirators are replaced once per year, and (3) cartridges (and cartridge filters and caps) are replaced at a rate of one pair (two cartridges) for every five of the 250 days that workers are exposed, or 50 times per year. For example, for the respirator type described at 40 CFR §721.63(a)(5)(xv), the annual cost per worker in 2019 dollars would be as follows:

($29.50 per respirator + ($6.38 per cartridge × 50 cartridges/year)) × 1.099 inflation factor = $481 per worker.

Typically, a SNUR describes more than one type of respirator, but only one type of respirator is needed to comply with the workplace protection requirements.

Table C-7: Annual Per-Chemical Costs for Respiratory Protection (40 CFR §721.63(a)(4))

721.63 (a)(5) par.	NIOSH approval type at 40 CFR §721.63 (a)(5) *(See Table C-6 for cross-walk to respirators in SNUR)*	Annual Average Costs (2014$)			Annual Average Costs (2020$)[1]		
		Respirator Unit	Cartridge Set	Per Worker[2]	Inflation Factor	Annual Per Worker	Annual Per Site (25 workers)
(i)	19C Type C Supplied-air with full facepiece	$1,857	$0.00	$1,857	1.099	$2,041	$51,025
(ii)	19C Type C Supplied-air with tight-fitting facepiece	$1,857	$0.00	$1,857	1.099	$2,041	$51,025
(iii)	19C Type C Supplied-air with hood or helmet or tight-fitting facepiece	$2,343	$0.00	$2,343	1.099	$2,575	$64,375
(iv)	21C Air-purifying with full facepiece and high efficiency particulate filters (HEPAs)	$258	$8.57	$687	1.099	$755	$18,875
(v)	21C Powered air-purifying (PAPR) with tight fitting facepiece and HEPAs	$1,086	$28.11	$2,492	1.099	$2,739	$68,475
(vi)	21C PAPR with loose hood or helmet and HEPAs	$2,497	$55.35	$5,265	1.099	$5,786	$144,650
(vii)	21C Air-purifying with HEPA and disposable respirators	$29.50	$6.38	$349	1.099	$384	$9,600
(viii)	23C air-purifying with full facepiece and combination cartridges approved for paints, lacquers and enamels (PLE)	$258	$17.56	$1,136	1.099	$1,248	$31,200
(ix)	23C PAPR with tight-fitting facepiece and combination cartridges approved PLE	$1,086	$116	$6,866	1.099	$7,546	$188,650
(x)	23C PAPR with loose-fitting hood or helmet and combination cartridges for PLE	$2,362	$112	$7,962	1.099	$8,750	$218,750
(xi)	23C Air-purifying with combination cartridges for PLE, including disposable respirators	$29.50	$8.16	$438	1.099	$481	$12,025
(xii)	23C Air-purifying with full-facepiece and organic gas/vapor cartridges	$258	$8.98	$707	1.099	$777	$19,425
(xiii)	23C PAPR with tight-fitting facepiece and organic gas/vapor cartridges	$1,086	$95.09	$5,841	1.099	$6,419	$160,475
(xiv)	23C PAPR with a loose-fitting hood or helmet and organic gas/vapor cartridges	$2,362	$87.23	$6,724	1.099	$7,390	$184,750
(xv)	23C Air-purifying with organic gas/vapor cartridges, including disposable cartridges	$29.50	$6.38	$349	1.099	$384	$9,600

Notes:

[1] Annual average costs were inflated as described in Table B-3.

[2] "Respirator unit" costs include both the respirator and any required add-ons such as hoods and helmets. A "cartridge set" includes two cartridges and any filters or caps required. Assumes cartridge sets are replaced every five days (50 times during 250 exposure days) so that each worker requires one respirator unit and 50 cartridge sets per year.

Table C-8 shows how the average costs per NIOSH-type respirator shown in Table C-7 were calculated, based on prices of respirators listed on Grainger's industrial supply website (Grainger 2014). To calculate the cost of respirators that meet the NIOSH criteria, the prices of units listed on the website that meet each NIOSH criteria were averaged. Costs of additional items such as hoods, helmets, cartridges, and filter caps were also obtained. These are added to the cost of the basic respirator unit if they are required under the SNUR regulation and if the unit does not already include the item. For example, §721.63(a)(5)(x) requires a hood or helmet. One model on the website that satisfies the requirement already includes a hood, while another unit requires that a separate hood be purchased. The cost of the hood was added to the unit cost and the combined cost was then averaged with the model with integrated hood.

Many respirator specifications also require cartridges. The costs of the cartridges were averaged for the corresponding requirements. In some instances, certain cartridges or filters require a secondary cartridge to function properly (e.g., some paint, lacquer and enamel filters required the organic vapors cartridges and filter retainer caps). These additional items were priced and added to the cost for the basic cartridge before averages were taken.

Some cartridge prices were unavailable, for instance, §721.63(a)(5)(ix) and (x) require a powered air-purifying respirator (PAPR) with a paint, lacquer and enamel cartridge. The only cartridges available for these models of respirators are HEPA cartridges. In these cases, the costs of a paint, lacquer, and enamel cartridge are assumed to be the same as for a HEPA cartridge.

The Grainger (2014) purchase costs of the varying types of respiratory protective equipment are shown in Table C-8.

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type	Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	2014 Average Cost: Respirator Unit	2014 Average Cost: Cartridge Set
(i)	*19C Type C Supplied-air with full facepiece*							*$1,857*	--
				$1,323					
				$2,390					
(ii)	*19C Type C Supplied-air with tight-fitting facepiece*							*$1,857*	--
				$1,323					
				$2,390					
(iii)	*19C Type C Supplied-air with hood or helmet or tight-fitting facepiece*							*$2,343*	--
				$2,093					
				$2,593					
(iv)	*21C Air-purifying with full facepiece and high efficiency particulate filters (HEPAs)*							*$258*	*$8.57*
		4JG19	3M: Low Maintenance Full Face Respirator, Silicone/Thermoplastic Elastomer Facepiece	$232	3PB42	3M P100 Filters for Half and Full Face Respirator	$6.90		
		5WZA2	3M Ultimate FX Respirator	$340					
		3A183	North by Honeywell: Full Face Respirator, Silicone Facepiece	$384	T451	North by Honeywell: Filter, Magenta	$9.05		
		5VD41	North by Honeywell: Low Maintenance Full Face Respirator, Thermoplastic Elastomer Facepiece	$194					
		5HB59	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point, Bayonet	$165	3NVJ9	Honeywell: Bayonet Filter, P100	$9.95		
		3NVJ2	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point Bayonet with Mesh	$276					

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type	Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	2014 Average Cost	
								Respirator Unit	Cartridge Set
		3NVT7	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point, Threaded	$180	3NVL3	Honeywell: Threaded Filter, P100	$8.11		
		3NVT4	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point Threaded with Mesh	$269					
		3PPP3	MSA: Full Face Respirator, Silicone Facepiece 4 point, Bayonet	$226	LN08	MSA: Bayonet Magenta Filter	$5.95		
		3PB94	MSA: Full Face Respirator, Silicone Facepiece European Style 4 point, Bayonet	$200					
		4LR28	MSA: Full Face Respirator, Silicone Facepiece European Style 5 point threaded	$372	4LR74	MSA: Threaded Magenta Filter	$11.44		
(v)	*21C Powered air-purifying (PAPR) with tight fitting facepiece and HEPAs*							*$1,086*	*$28.11*
		8EM74	3M: PAPR System, L, Rechargeable NiMH	$1,010	9W546	3M: PAPR HEPA Cartridge for 3M PAPR Systems	$32.29		
		9CRJ8	3M: PAPR System, M, Rechargeable NiMH	$954					
		5JGF6	MSA: PAPR System, 4 Point Suspension	$1,446	2YRD2	MSA:PAPR HEPA Cartridge for MSA TL PAPR	$23.93		
		5KB69	MSA: PAPR System, 5 Point Suspension	$933					
(vi)	*21C PAPR with loose hood or helmet and HEPAs*							*$2,497*	*$55.35*
		11W052	3M: PAPR System, Belt-Mounted, PETG, with hood	$2,144	9W546	3M:PAPR HEPA Cartridge for 3M PAPR Systems	$32.29		
		11W053	3M: PAPR System, Li-Ion, Polycarbonate, with helmet	$2,838					
		32HD65	ALLEGRO: Pureflo PAPR White Helmet/Hood HE Filter	$3,036	32HD72	ALLEGRO: Pureflo HE (HEPA) Filter	$104		

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type	Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	2014 Average Cost	
								Respirator Unit	Cartridge Set
		16M251,16M257,16M249	North by Honeywell: PAPR System Backpack + Hood+ Breathing Tube	$2,248	1AAN4	North by Honeywell: Magenta	$29.75		
		16M250,16M257,16M249	North by Honeywell: PAPR System Belted + Hood+ Breathing Tube	$2,218					
(vii)	*21C Air-purifying with HEPA and disposable respirators*							*$29.50*	*$6.38*
		8CCM3	3M 6000 Series Low-Maintenance Respirator	$29.50	5WYZ4	3M: Disk Filter P100	$6.38		
(viii)	*23C air-purifying with full facepiece and combination cartridges approved for paints, lacquers and enamels (PLE)*							*$258*	*$17.56*
		4JG19	3M: Low Maintenance Full Face Respirator, Silicone/Thermoplastic Elastomer Facepiece	$232	3PB42	3M: Black/Magenta Cartridge for Half and Full Face Respirator	$19.88		
		5WZA2	3M Ultimate FX Respirator	$340					
		3A183	North by Honeywell: Full Face Respirator, Silicone Facepiece	$384	4JG10	North by Honeywell: Black/Magenta Cartridge	$18.25		
		5VD41	North by Honeywell: Low Maintenance Full Face Respirator, Thermoplastic Elastomer Facepiece	$194					
		5HB59	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point, Bayonet	$165	4EU80	Honeywell: Combination Cartridge, Bayonet	$19.20		
		3NVJ2	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point mesh	$276					

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type							2014 Average Cost	
		Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	Respirator Unit	Cartridge Set
		3NVT7	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point threaded	$180	3NVN9	Honeywell: Combination Cartridge, Threaded	$18.29		
		3NVT4	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point mesh, threaded	$269					
		3PPP3	MSA: Full Face Respirator, Silicone Facepiece 4 point, Bayonet	$226	4LN01	MSA: Combination Cartridge Bayonet	$15.13		
		3PB94	MSA: Full Face Respirator, Silicone Facepiece European Style 4 point, Bayonet	$200					
		4LR28	MSA: Full Face Respirator, Silicone Facepiece European Style 5 point threaded	$372	4MG01	MSA: Combination Cartridge, Threaded	$19.31		

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type	Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	2014 Average Cost: Respirator Unit	2014 Average Cost: Cartridge Set
(ix)	*23C PAPR with tight-fitting facepiece and combination cartridges approved PLE*							*$1,086*	*$116*
		8EM74	3M: PAPR System, L, Rechargeable NiMH	$1,010	5F793	3M: PAPR OV, HEPA Filter	$171		
		9CRJ8	3M: PAPR System, M, Rechargeable NiMH	$954					
		5JGF6	MSA: PAPR System, 4 Point Suspension	$1,446	3NNF7	MSA: PAPR Black/Magenta Filter	$60.17		
		5KB69	MSA: PAPR System, 5 Point Suspension	$933					
(x)	*23C PAPR with loose-fitting hood or helmet and combination cartridges for PLE*							*$2,362*	*$112*
		11W052	3M: PAPR System, Belt-Mounted, PETG, with hood	$2,144	5F793	3M: PAPR OV, HEPA Filter	$171		
		11W053	3M: PAPR System, Li-Ion, Polycarbonate, with helmet	$2,838					
		16M251,16M257,16M249	North by Honeywell PAPR System Backpack + Hood+ Breathing Tube	$2,248	1AAN4	North by Honeywell: Black and Magenta	$53.75		
		16M250,16M257,16M249	North by Honeywell PAPR System Belted + Hood+ Breathing Tube	$2,218					
(xi)	*23C Air-purifying with combination cartridges for PLE, including disposable respirators*							*$29.50*	*$8.16*
		8CCM3	3M 6000 Series Low-Maintenance Respirator	$29.50	5WYZ4	3M: Disk Filter P100	$8.16		
(xii)	*23C Air-purifying with full-facepiece and organic gas/vapor cartridges*							*$258*	*$8.98*
		4JG19	3M: Low Maintenance Full Face Respirator, Silicone/Thermoplastic Elastomer Facepiece	$232	6AM37	3M OV Filters for Half and Full Face Respirator	$8.05		
		5WZA2	3M Ultimate FX Respirator	$340					

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type							2014 Average Cost	
		Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	Respirator Unit	Cartridge Set
		3A183	North by Honeywell: Full Face Respirator, Silicone Facepiece	$384	16M237	North by Honeywell: Respirator Cartridge, Black	$9.51		
		5VD41	North by Honeywell: Low Maintenance Full Face Respirator, Thermoplastic Elastomer Facepiece	$194					
		5HB59	Honeywell: Full Face Respirator, Silicone Facepiece. 5 point, Bayonet	$165	4EU73	Honeywell: OV Chemical Cartridge, Bayonet	$9.52		
		3NVJ2	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point Bayonet with Mesh	$276					
		3NVT7	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point, Threaded	$180	4EU73	Honeywell: OV Chemical Cartridge, Threaded , Bayonet	$9.25		
		3NVT4	Honeywell: Full Face Respirator, Silicone Facepiece, 5 point Threaded with Mesh	$269					
		3PPP3	MSA: Full Face Respirator, Silicone Facepiece 4 point, Bayonet	$226	4LM93	MSA: Black Chemical Cartridge	$7.81		
		3PB94	MSA: Full Face Respirator, Silicone Facepiece European Style 4 point, Bayonet	$200					
		4LR28	MSA: Full Face Respirator, Silicone Facepiece European Styl 5 point threaded	$372	4LR57	MSA: Black Chemical Cartridge, Threaded	$9.71		
(xiii)	*23C PAPR with tight-fitting facepiece and organic gas/vapor cartridges*							*$1,086*	*$95.09*
		8EM74	*3M: PAPR System, L, Rechargeable NiMH*	$1,010	5F789				

Table C-8: Respirator Prices and Average Costs in 2014, by NIOSH Type

40CFR §721.63 (a)(5)	NIOSH Type	Item Number	Respirator Description[1]	2014 Cost	Item Number	Filter/Cartridge Description[1]	2014 Cost	2014 Average Cost: Respirator Unit	2014 Average Cost: Cartridge Set
		9CRJ8	*3M: PAPR System, M, Rechargeable NiMH*	$954		*3M: PAPR Black Cartridge for 3M PAPR Systems*	$130		
		5JGF6	*MSA: PAPR System, 4 Point Suspension*	$1,446	3NNF7	*MSA: PAPR Black/Magenta Filter*	$60.17		
		5KB69	*MSA: PAPR System, 5 Point Suspension*	$933					
(xiv)	*23C PAPR with a loose-fitting hood or helmet and organic gas/vapor cartridges*							*$2,362*	*$87.23*
		11W052	3M: PAPR System, Belt-Mounted, PETG, with hood	$2,144	5F789	3M: PAPR Black Cartridge for 3M PAPR Systems	$130		
		11W053	3M: PAPR System, Li-Ion, Polycarbonate, with helmet	$2,838					
		16M251,16M257,16M249	North by Honeywell PAPR System Backpack + Hood+ Breathing Tube	$2,248	1AAN4	North by Honeywell: Black Cartridge	$44.45		
		16M250,16M257,16M249	North by Honeywell PAPR System Belted + Hood+ Breathing Tube	$2,218					
(xv)	*23C Air-purifying with organic gas/vapor cartridges, including disposable cartridges*							*$29.50*	*$6.38*
		8CCM3	3M 6000 Series Low-Maintenance Respirator	$29.50	5WYZ4	3M: OV Filter[4]	$6.38		

Notes:
[1] See Table C-6 for the cross-walk between respirator types in the SNUR and in this table.
[2] Paint, lacquer and enamel (PLE) cartridges for PAPRs were not listed in the catalog. The costs for PLE cartridges are assumed to be the same as combination HEPA and OV cartridges, as both particulate and vapor filters are recommended for paints (U.S. Safety 2011).
[3] Organic Vapor cartridges were not listed in the catalog for disposable respirators. The costs for OV cartridges are assumed to be the same as HEPA cartridges.
Sources:
The prices for respirator systems were taken from Grainger (2014) and EPA (1999)

C.2 Modifying the Hazard Communication Program

As mentioned in Section 2.1.2, it is assumed that each facility has in place a haz-comm program consistent with that required by OSHA's Hazard Communication Standard (CFR 1910, 1983), so that costs attributable to the SNUR are costs of adding one chemical to the program. Much of the haz-comm methodology and assumptions used in this analysis came from the EPA report, *Economic Analysis of Final Significant New Use Rules: General Provisions for New Chemical Followup* (EPA 1989), which in turn relied partly on the economic analyses performed for the 1983 version of the OSHA standard, *Final Regulatory Impact and Regulatory Flexibility Analyses of the Hazard Communication Standard* (OSHA 1983).

EPA assumes that the haz-comm costs are incurred each year. For example, worker turnover creates the need for refresher training; the MSDS/SDS may need to be updated; placards wear out (EPA 1989). To the extent that some steps do not need to be repeated each year, costs will be lower than estimated here. The hazard communication program costs summarized in Table 2-5 of this economic analysis are detailed in this appendix.

C.2.1 Updating the Written Program

If the SNUR cites 40 CFR §721.72(a), then to avoid engaging in a Significant New Use, which would trigger other SNUR requirements, manufacturers must update their written haz-comm program to incorporate information about the chemical. The written part of the program includes data and information about hazardous chemicals present in the workplace, the hazards associated with such chemicals, procedures for employees who routinely work with or around such chemicals, procedures for non-routine tasks that may involve exposure (e.g., tank cleaning), and personal protective equipment requirements when working with or around such chemicals.

While material safety data sheets may provide much of the information needed to update the written haz-comm program, many employers may perform a more detailed assessment of exposure risks associated with the chemical and develop more site-specific procedures for workers potentially exposed to such chemicals. For purposes of the economic analysis, EPA assumes that each employer will engage the services of a professional industrial hygienist (IH), either in-house or on a consulting basis, for four hours to perform such an assessment. Loaded hourly rates for IH services were calculated based on Bureau of Labor Statistics data, as described in Table B-1 and Table B-2. Costs for updating the written haz-comm program, in 2019 dollars, are as follows[22]

4 hours Industrial Hygienist time × $63.17 per hour = $253

The estimates of IH hours to update the program come from a 1998 EPA report (EPA 1998).

[22] Figures presented here are rounded.

C.2.2 Labeling

If the SNUR cites 40 CFR §721.72(b), then to avoid engaging in a Significant New Use, manufacturers must ensure that containers used to distribute the PMN substance in commerce are labeled with the necessary hazardous substance warnings and procedures. In addition, containers used in the workplace must bear similar labels or, alternatively, the employer must provide equivalent signage, operating procedures, or other written material to communicate hazard information to workers.

Standard formats are assumed to be used for creating labels or other signage, and the information required for the labels is assumed to be already available from the MSDS for the chemical (see below).

Chemicals Distributed in Commerce. For chemicals distributed in commerce, the labeling process is assumed to require 0.5 hours of technical labor time per chemical to compile label information. The technical labor rate is fully loaded with fringe benefits and overhead, as described in Appendix B.

EPA assumes that 480 labels are required per chemical, based on EPA, (1989), and the assumption that, on average, each chemical is shipped twice monthly to 20 customers. This is consistent with roughly 10,000 kilograms of chemical per year shipped in 40 five-gallon containers per month (EPA 1989).[23]

EPA assumes that labels are designed in compliance with the 2012 OSHA Hazard Communication Standard. OSHA estimates the cost per label to be $0.15 (ERG 2011). The resulting costs of labeling for chemicals distributed in commerce, per chemical substance at one site, are shown in Table C-9.

Table C-9: Annual Costs of Labeling for Distribution in Commerce (40 CFR §721.72(b)(2))

Cost Element	Unit Cost (2011$)	Inflation Factor	Unit Cost (2020$)		Hours	Total Cost
0.5 hours technical time	--	--	$83.76	per hour	0.5	$41.88
480 labels	$0.15 per label	1.138	$0.17	per label	--	$81.60
				TOTAL	**0.5**	**$121**

Sources:
Label cost, ERG (2011); cost elements, quantities, EPA (1989); inflators, labor, Table B-1 and Table B-3.

Chemicals Used in the Workplace. Costs for workplace labeling requirements are estimated by assuming that the facility purchases six large signs, priced at $39.56 each in 2020 dollars, based on prices obtained from a national safety equipment supply website (Grainger 2014). These signs will be mounted in areas where the chemicals are used or formulated. For example, a placard might be posted at each of six

[23] Data on PMN notices suggest that some PMN submitters expected to produce less than 10,000 kilograms per year of the SNUR chemicals, but many expected to produce much more. It is not known whether volumes listed in the PMNs were realized in practice. Production volumes of secondary suppliers affected by the SNUR are also unknown. Annual volumes significantly greater than 10,000 kg could lead to higher haz-comm costs than those estimated here.

vessels: a mixing tank, a reactor, two separators, and two storage vessels (EPA 1989). The labeling process is also assumed to require 0.5 hours of technical time to compile label information and ten minutes of production worker time to post each of the six placards. Technical labor costs include wages, fringe benefits, and overhead, as described in Appendix B.

The resulting per chemical, per site costs of labeling for chemicals in the workplace are shown in Table C-10.

Table C-10: Annual Costs of Labeling for Use in Workplace (40 CFR §721.72(b)(1))

Cost Element	Unit Cost (2014$)	Inflation Factor	Unit Cost (2020$)		Total Hours	Total Cost
technical staff time	--	--	$83.76	per hour	0.5	$41.88
production worker time	--	--	$36.44	per hour	1.0	$36.44
6 placards	$54.30 per item	1.099	$59.68	per item	--	$358.08
				TOTAL	**1.5**	**$436**

Sources:
Placard cost, Grainger (2014); cost elements and quantities, EPA (1989); inflators and labor unit costs, Table B-1 and Table B-3.

C.2.3 Preparing Material Safety Data Sheet (MSDS) Information

If the SNUR cites 40 CFR §721.72(c), then to avoid engaging in a Significant New Use, each facility is required to create, post, and distribute material safety data sheets (MSDSs). We assume that facilities create Safety Data Sheets (SDS)[24] in compliance with the 2012 OSHA Hazard Communication Standard (OSHA 2012). According to PP&E (2009), depending on size of the firm, it is estimated to take 3 to 8 hours to develop an SDS that complies with the 2012 OSHA requirements. For this analysis, we use the average of this range, 5.5 hours. The loaded hourly wage rates are derived in Appendix B. Further, EPA assumes that the manufacturer provides 20 copies of the MSDS to customers and retains 20 copies for use onsite (EPA 1989). Using best professional judgement, EPA assumes that an SDS is, on average, 10 pages long. Per-page photocopy cost was based on Staples (Staples 2017); in-house printing costs would likely be less. The resulting cost of MSDS preparation is shown in Table C-11.

Table C-11: Annual Costs for Material Safety Data Sheets (MSDSs) (40 CFR §721.72(c))

Cost Element	Unit Cost (2020$)		Units	Total Cost
technical staff time	$83.76	per hour	5.5	$460.68
40 copies (10 pages each)	$0.085	per copy	400	$34.00
			TOTAL	**$495**

Sources:
Cost elements and quantities, EPA (1989); labor unit costs, Table B-1 and Table B-3; copy costs. Staples (2017).

[24] OSHA's 2012 HCS revision replaces MSDS with SDS. The information contained in the SDS is mostly the same as the MSDS, except now the SDSs are required to be presented in a consistent user-friendly, 16-section format. (EPA 2012).

C.2.4 Employee Training

The final required component of the haz-comm program is employee training, based on 40 CFR §721.72(d). EPA (1989) assumes that a training program currently is in place, but the existing program must be modified to add new information pertaining to the PMN substance. Subsequently, the training program must be expanded to include such material each time the training course is presented. Costs of modifying the program and presenting the modified program are mainly labor costs for the trainer and the trainees.

Inserting the new information about the PMN substance into the training program and conducting the revised training is assumed to require 0.5 hours of the trainer's time. An additional 0.25 hours per trainee is estimated to be required, and an average of 25 affected workers is assumed per facility (EPA 1989). If additional production workers needed to be trained, for example because they might come into contact with the chemical due to spills or leaks, training costs could be higher than estimated here (EPA 1989).

Labor rates for training are based on the loaded rates derived in Appendix B for chemical technicians and chemical industry production workers. The total cost of the employee training requirement is shown in Table C-12.

Table C-12: Annual Costs for Employee Training, Per Chemical (40 CFR §721.72(d))

Cost Element	Wage Rate (2020$ per hour)	Hours per Employee	Number of Employees	Total Hours	Total Cost
trainer updating training program (technical time)	$83.76	0.5	1	0.5	$41.88
employees attending training program (production worker time)	$36.44	0.25	25	6.25	$228
TOTAL				**6.75**	**$254**

Sources:
Cost elements and quantities, EPA (1989); labor unit costs, Table B-1

C.3 Recordkeeping

There are two main types of recordkeeping requirements for the substances listed in the current SNURs: those for companies submitting a SNUN, and those for all companies that manufacture, import or process SNUR-regulated substances, regardless of whether they have made a submission to EPA.

C.3.1 SNUN Submitters

Companies submitting a SNUN must keep records under 40 CFR §721.40. Some EPA reports have assumed that SNUN recordkeeping hours would be 5 percent of SNUN submission hours, or about five to

six hours.[25] Other EPA reports have estimated that electronic submission of SNUNs is expected to reduce the recordkeeping burden to approximately one hour (EPA 2009a, p. 16) For this report, the SNUN recordkeeping hours were included in the SNUN submission hours (see Table 2-8) and the SNUN recordkeeping cost was not separately estimated.[26]

C.3.2 All Manufacturers, Importers, and Processors

Whether or not they submit a SNUN, firms that manufacture, import, or process the SNUR substance must keep records based on 40 CFR §721.125(a) through (k), to document compliance with SNUR conditions for avoiding a Significant New Use. (For firms producing under the R&D exemption, R&D recordkeeping would be needed. R&D recordkeeping costs were not estimated for this report.)

Recordkeeping requirements vary between PMN chemicals, reflecting differences in SNUR restrictions. For all chemicals in the current SNURs, manufacturers, importers, and processors must keep records on quantities supplied or purchased under 40 CFR §721.125(a), (b), and (c). For chemicals with water discharge restrictions, companies must keep records concerning water discharge compliance, under §721.125(k). For chemicals with other use restrictions, or for those few chemicals with workplace protection or hazard communication restrictions, companies must keep records under other 40CFR §721.125 paragraphs, to document compliance.

The 2009 final PMN Electronic Reporting (ePMN) Rule that requires the electronic submission of all TSCA Section 5 notices. Therefore, EPA expects that records supporting TSCA Section 5 submissions, including SNUNs, will be created and stored electronically, including records related to: manufacturing, importing, or processing volumes; shipment amounts and customer information; clothing impermeability determinations; the hazard communication program including labels and MSDS copies; compliance with other use restrictions; and/or compliance with disposal and release to water limitations. Records must be maintained for five years from the date of their creation.

Costs for compliance with the recordkeeping requirements for substances subject to a SNUR are based on the approach in *Economic Analysis of Final Significant New Use Rules: General Provisions for New Chemical Followup* (EPA 1989) which in turn was based on *Recordkeeping Costs for a Generic SNUR*, prepared for EPA in 1988 by Kearney/Centaur (Kearney 1988b). These reports drew on recordkeeping costs estimated for the Comprehensive Assessment Information Rule, CAIR. Industry recordkeeping costs for CAIR compliance were estimated in reports Kearney prepared for EPA, including *Estimated Cost of the Final Comprehensive Assessment Information Rule*, June 1, 1988 (Kearney 1988a, pp. 63 to

[25] For example, OPPT's Information Collection Request (ICR) for *TSCA Section 5(a)(2) Significant New Use Rules for Existing Chemicals (Renewal),* October 11, 2005, estimates SNUN recordkeeping costs at 5.67 hours (EPA 2005b, p. 12).

[26] SNUN submission costs estimated in Table 8 of this report were based on PMN submission costs from a 1994 report, *Regulatory Impact Analysis of Amendments to Regulations for TSC Section 5 Premanufacture Notifications* (EPA 1994). Page III-14 of the 1994 report refers to "the normal records kept with a PMN submission which are included in the estimates for submission costs." Page III-12 identifies "maintaining a file of the submission" as part of the labor hours for the PMN reporting form. These statements imply that the 95 to 114 total hours for a PMN submission (EPA 1994, p. III-10) included recordkeeping hours.

65). To account for the burden reductions resulting from for electronic reporting, these recordkeeping costs were updated using the approach outlined *in The Economic Analysis of the Premanufacture Notification Electronic Reporting Rule* (EPA 2009b).

This report uses the basic Kearney (1988a and 1988b) estimates and assumptions to estimate recordkeeping costs for SNUR requirements and adjusts for efficiencies and costs savings generated by electronic submissions. Unlike Kearney (Kearney 1988b), this report presents costs for each §721.125 recordkeeping requirement separately. However, the underlying methodology is identical to the Kearney 1988b/RIB 1989 reports, resulting in identical costs per chemical except for differences due to inflation and rounding. The paragraphs that follow describe estimates and assumptions used from Kearney (1988a and 1988b).

Cost per page. Kearney (1988b) based recordkeeping costs on a cost per page basis and assumes that the ratios of labor hours to page count for each labor category, file drawer space to page count, and cost of miscellaneous supplies such as folders and labels to page count, are the same as the per-page ratios estimated for EPA's Comprehensive Assessment and Reporting Rule. The CAIR estimates are given in the 1988 report, Estimated Cost of the Final Comprehensive Assessment Information Rule, June 1, 1988, page 65 (Kearney 1988a). EPA (2009a) assumes that the recordkeeping burden for SNURs will be reduced by half because of the efficiencies in creating and storing Section 5 notices and supporting documents electronically. Therefore, the per-page labor burden estimates from the CAIR report (Kearney 1988a) have been reduced by half. In addition, all material costs associated with paper records, such as paper, and, filing cabinets have been removed, as files will now be stored electronically.

Table C-13 summarizes estimates from Kearney (1988b) and the CAIR report (Kearney 1988a) and adjusts for electronic reporting. It also shows the derivation of costs from these estimates, after inflation. The method is as follows:

- Technical labor was estimated at 1 hour for 750 pages in the CAIR report (Kearney 1988a, p. 65), or .00133 hours per page. Adjusting for electronic submissions, this burden is now .00067 hours per page. The analysis estimates a cost per hour and per page using fully loaded labor rates from Table B-1.

- Clerical labor was estimated at 10 hours for 750 pages in the CAIR report (Kearney 1988a, p. 65), or .01333 hours per page. Adjusting for electronic submissions this burden is now .00667 hours per page. The analysis estimates a cost per hour and per page using fully loaded labor rates from Table B-1.

The material costs described in Kearney (1988a and 1988b), such as photocopying, file storage, and miscellaneous materials costs are not considered in this analysis, due to the cost savings from keeping electronic files under the *Electronic Reporting Requirements for Certain Information under the Toxic Substances Control Act* rule.

Table C-13: Recordkeeping Estimates from Kearney (1988a; 1988b)

Labor Costs	Kearney Estimates for CAIR Rule (1988a and 1988b)				Adjusted for Inflation Per Page Cost - 2020$	
	Hours	ePMN Cost Savings	CAIR Pages	Cost Per Page	Cost Per Hour	Cost Per Page
	(a)	(b)	(c)	(d) = [(a) *(b)]/(c)		
Technical	1	50%	750	0.00067	$83.76	$0.06
Clerical	10	50%	750	0.00667	$35.84	$0.24
Total Labor						**$0.30**

Notes:

Per-page labor hours and materials costs were originally estimated in Kearney (1988a) for the CAIR rule. The CAIR per-page costs were then used to estimate SNUR recordkeeping per-page costs in Kearney (1988b), and adjusted for the burden reductions from electronic reporting using the approach outlined in EPA (2009a). This clarifies the method by which the original CAIR per-page costs and hours were calculated. It also adjusts costs for inflation using labor rates from Table B-1 and inflation factors from Table B-3.

Pages per chemical at one site. In order to estimate recordkeeping costs, the analysis multiplies the costs per page for each recordkeeping element estimated in Table C-13 by the number of pages required for each SNUR recordkeeping requirement at 40 CFR §721.125 as estimated by Kearney (1988b). The Kearney data was used by EPA in its original expedited-SNUR economic analysis (EPA 1989). For example, maintaining MSDS copies as required at §721.125(h) would require 5 pages. The following estimates from Kearney (1988b) are also used:

- Manufacture and import volume, and sales and transfer data require 485 pages of records per year. This reflects 40 invoices per month (see haz-comm Section C.1 above), 480 for sales/transfer and 5 for manufacturer/import (1988b, p.11).
- Disposal compliance records, if required, cover items such as waste production, shipping manifests, permits, and transfer receipts. The 600 disposal compliance pages assume 50 pages per month (Kearney 1988b, p.11).

(This report uses slightly different terminology from EPA (1989): "Protective clothing" instead of "protective gloves," "haz-comm" instead of "employee information and training." Recordkeeping for "impermeability determination" was not separately costed out in EPA (1989). This report assumes it is included under "protective clothing" recordkeeping.)

Cost per chemical. Table C-14 shows annual recordkeeping activities at one site for one SNUR chemical, by CFR requirement. If all recordkeeping requirements at 40 CFR §721.125 applied to a single chemical, there would be costs for 1.1 hours of technical time and 11.4 hours of clerical time. However, in reality, few if any chemicals will have all of the recordkeeping requirements listed in Table C-14. Recordkeeping costs would be lower for chemicals with relatively few SNUR restrictions because fewer pages would be needed to document SNUR compliance.

Table C-14 does not include costs of recordkeeping resulting from a SNUN submission; those costs were included in the SNUN submission cost.

Table C-14: Annual Per-Chemical Costs of Recordkeeping Requirement (40 CFR 721.125)

40CFR §721.125[2]	Requirement	Pages	Labor and Materials Cost[1] (2020$)		Hours	
			Per Page	Per Chemical	Per Page	Per Chemical
		(a)	(b)	(c)=(a)*(b)	(d)	(e)=(a)*(d)
(a)(b)(c)	Volumes & sales/transfer data	485	$0.30	$146	0.00734	3.56
(d)(e)	Protective clothing (§721.63) and impermeability (§721.63(a)(3))	20	$0.30	$6.00	0.00734	0.15
(f)	Haz-comm program (§721.72)	250	$0.30	$75.00	0.00734	1.84
(g)	Label copies (§721.72(b))	5	$0.30	$1.50	0.00734	0.04
(h)	MSDS copies (§721.72(c))	5	$0.30	$1.50	0.00734	0.04
(i)	Use limitations compliance (§721.80)	250	$0.30	$75.00	0.00734	1.84
(j)	Disposal compliance (§721.80)	600	$0.30	$180	0.00734	4.40
(k)	Release to water compliance (§721.90)	100	$0.30	$30.00	0.00734	0.73
	TOTAL	**1,715**	**--**	**$515**	**--**	**12.60**

Notes:

[1] This table multiplies cost per page estimates from Table C-13 by the number of pages estimated for each recordkeeping cost element. (This table does *not* include recordkeeping for SNUN submissions required by 40 CFR §721.40.)

[2] 40 CFR 721.125(a) through (k) list recordkeeping that may be specified in the SNUR. The recordkeeping specified depends on which 40 CFR §721 provisions (in parentheses) were used by the SNUR to define reportable New Uses (§721.63, §721.72, §721.80, and/or §721.90). Few if any SNUR chemicals would require all of the recordkeeping costs listed above since few if any chemicals are subject to all of the requirements (a) through (k).

[3] Pages count estimates for each SNUR requirement are from Kearney (1988b).

Appendix D: References

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