



**SUMMARY OF COMMENTS & RESPONSES
OZONE DEPLETING SUBSTANCES PROJECT PROTOCOLS
DRAFT VERSIONS 2.0**

9 sets of comments were received during the public comment period for the Climate Action Reserve (Reserve) draft Ozone Depleting Substances (ODS) Project Protocols Versions 2.0. Some comments have been edited for length, and similar comments have been combined. Referenced sections refer to the U.S. Protocol; most edits to language were suggested for both protocols even if referenced under a section from the U.S. Protocol. Reserve staff summarizes and provides responses to these comments below.

The comment letters can be viewed in their entirety on Reserve's website at <http://www.climateactionreserve.org/how/protocols/ozone-depleting-substances/revision/>

COMMENTS RECEIVED BY:

1. Coolgas, Inc. (Coolgas)
2. Environmental Credit Corp. (ECC)
3. Energy Changes Projektentwicklung GmbH (Energy Changes)
4. EOS Climate (EOS)
5. First Environment, Inc. (FE)
6. Hudson Technologies (Hudson)
7. RAL Quality Assurance Association (RALQAA)
8. Reclamation Technologies, Inc. dba RemTec International (RemTec)
9. Safe Disposal Systems, Inc. (SDS)

Table of Content

2.3	Eligible ODS	1
2.3.1	Refrigerant Sources.....	1
2.4	Eligible ODS Sources	2
3.2	Project Start Date	2
3.5	Regulatory Compliance	3
5	Quantifying GHG Emission Reductions	4
5.1	Quantifying Baseline Emissions.....	6
5.1.2	Calculating Baseline Emissions from Shredding and/or Landfilling ODS Foam Blowing Agents.....	7
5.2	Quantifying Project Emissions	7
5.3	Deduction for Vapor Composition Risk	7
6.2	Point of Origin Documentation Requirements	11
6.6	Concentrated ODS Composition and Quantity Analysis Requirements.....	13
6.6.1	Analysis of Mixed ODS	15
8.6	Verification Site Visits	17

2.3 Eligible ODS

1. Section 2.3 (and Table 8.3 Item 2.2): “ODS Sources not in one of the above categories, such as ODS that were produced for, used as, *or intended for* use as solvents, medical aerosols, or other applications are not eligible under this protocol.” [Emphasis added.]

ECC recommends the removal of the words “or intended for” in the above excerpt. ECC appreciates and supports the desire to exclude ODS which was actually used in solvent applications. However, we believe that it is impossible to determine whether ODS which was not actually utilized in solvent applications was intended to be used in such applications. This language would place an impossible burden on verifiers and project developers to determine intent. **(ECC, SDS)**

RESPONSE: Agreed. The protocol has been modified accordingly.

2.3.1 Refrigerant Sources

2. **U.S. only:** We agree that it is appropriate to include CFC 113 and CFC 13 as eligible ODS refrigerants. **(Hudson)**

RESPONSE: Thank you for your comment.

3. **U.S. only:** Inclusion of CFC-13 and CFC-113: We have no problem with this proposal although we do not see any great practical relevance, as these ODS have never been found in household and commercial refrigeration equipment. We also doubt whether significant quantities of these ODS have ever been used in construction foams or other relevant applications. However, for the sake of completeness they should be included in both protocols. **(RALQAA)**

RESPONSE: Thank you for your comment.

4. **U.S. only:** The only concern we have is that R-13 is such high pressure that it is stored in high pressure cylinders. It is very difficult, if not impossible, to get a liquid sample of R-13. Without a liquid sample, the material may not be eligible. We also do not see much R-13 in the industry at this time. **(RemTec, Coolgas)**

RESPONSE: It is the responsibility of the project developer to ensure the protocol sampling requirements are met. Difficulty in meeting these requirements should not be the basis of a decision to disallow CFC-13 as an eligible material.

5. **U.S. only:** We agree that CFC-13 should also be added to the Protocol as an eligible refrigerant. CFC-13 has been used in low temperature commercial and industrial applications, such as ultralow temperature laboratory freezers. During development of the 1.0 Protocol, the working group had assumed that remaining use and inventories of R13 were negligible. Based on our recent experience, there is continuing demand for CFC-13 to recharge high value older equipment. Because of their age and high-pressure requirements, these older units commonly leak, and in many cases, the full refrigerant charge is released. **(EOS)**

RESPONSE: Thank you for your comment.

6. **U.S. only:** We agree with the proposed inclusion of CFC-113. It is our experience that CFC-113 is still in limited use and in circulation in the U.S., not as a solvent, but as refrigerant used in cooling systems. There are opportunities to collect the R-113, but as of now, the only incentive is to recycle it back into older equipment. Based on the fact that there is continuing demand for CFC-113 refrigerant, most if not all of the CFC-113 that is being destroyed would very likely be solvent. **(EOS)**

RESPONSE: Thank you for your comment.

7. While we agree that ODS refrigerant acquired from the Defense Logistics Agency (DLA) can be eligible under the Protocol, we disagree with the restriction on other ODS refrigerant sourced from the Federal government. The rationale provided is that DLA aggregates all “excess refrigerant” from federal installations. However, many federal agencies control the refrigerants in the equipment within their facilities and operations, from acquisition to disposal. These agencies do not rely on DLA for disposition of refrigerant when equipment is decommissioned or retrofitted. **[See EOS public comment submission for more detail.]**

As we argued in 2009 during development of the 1.0 Protocol, we believe ODS refrigerant acquired from the Federal government should be eligible for destruction credits, provided that the following conditions can be verified:

- The refrigerant was not imported into the U.S.
- There was no requirement for its destruction
- The refrigerant was recovered, handled, and transferred in accordance with Section 608 of the Clean Air Act and all other relevant regulations. **(EOS)**

RESPONSE: While this protocol revision only expands eligibility to refrigerant acquired through DLA auction, the Reserve will continue to investigate if the baseline assumptions in the protocol are appropriate for government-sourced materials. Eligibility could be expanded further in the future.

2.4 Eligible ODS Sources

8. **Article 5 only:** “The eligibility of privately held virgin ODS is subject to import restrictions as indicated in Section 3.2.” (pg. 5)

It is misleading to include this statement given that private stockpiles are no longer eligible. **(FE)**

RESPONSE: Agreed. The protocol has been modified accordingly.

3.2 Project Start Date

9. The project start date definition has been changed in order to include all project activities that affect sources of GHG emissions within the GHG Assessment Boundary. For the mixed ODS the start date is set as “the day that mixing procedures begin.” This is not in line with the project

boundary SSR since thus the transportation is not regarded as a project activity although emissions from transport must be accounted for as project emissions. Another argument is that the date of mixing are out of project developer's sphere of competence and influence and trespassing the 12 months rule may happen easily.

Suggestion: Specifying the start date for mixed ODS as the day that the project ODS departs the final collection or aggregation facility for transportation to the destruction facility, as it is for the concentrated ODS. This would enable the project developer to plan for the proper and sufficient timing. A condition could/should be applied that the mixing and destruction must occur within certain period (e.g. 2 months) after date of departure. **(Energy Changes)**

RESPONSE: The project start date definition has been changed to ensure a project's reporting period includes all project activities, both physically and temporally. The Version 1.0 start date definition did not capture important project activities within the reporting period, such as mixing project materials and transportation to the destruction facility. Along with resolving this issue, the revised start date definition also allows the Reserve to ensure regulatory compliance of all project activities. The project developer has a similar level of influence over the mixing facility as it does over the destruction facility, thus the revised definition does not represent a significant change in the project developer's "sphere of competence and influence".

Finally, it is important that the start date for mixed projects be the day when mixing begins (instead of departure to the destruction facility) in order to capture the activities at the mixing facility within the project's reporting period. The mixing facility has been added to the list of relevant SSRs in Section 4 to make this clearer.

10. **Article 5 only:** "Privately held and saleable virgin ODS refrigerants are not eligible under this protocol." (pg. 8)

As this requirement is more relevant to the discussion of eligible ODS sources in Section 2.4, we recommend moving this statement to that section. **(FE)**

RESPONSE: Agreed. The protocol has been modified accordingly.

3.5 Regulatory Compliance

11. The scope of regulatory compliance has been extended to include the mixing facility and transportation. Project developer thus must attest the regulatory compliance for other companies (service providers) which is out of project developer's sphere of competence and legal responsibility. **(Energy Changes)**

RESPONSE: While all project activities are not performed by the project developer, the project developer is responsible for ensuring that the project be in compliance with all applicable laws at all times during the implementation of project activities. Version 1.0 specified the regulatory compliance requirement included to the destruction facility and transportation of material to the destruction facility; extending this requirement to project activities at the mixing facility is similarly appropriate. Furthermore, as the mixing facility was a required site visit for verification bodies (VBs) under Version 1.0, most VBs have already been confirming regulatory compliance of the mixing facility while project

activities were taking place. The Reserve does not believe clarifying the scope of regulatory compliance creates undue burden on the project developer.

12. “Any upsets or exceedances of permitted emission limits at a facility must be managed in keeping with an authorized start-up, shutdown, and malfunction plan (40 CFR 63.1206).”

It is not clear whether this applies to transportation too, since there are no “permitted emission limits at a facility” and especially for transportation within the Article 5 countries (it is probable that any plan is not required in an A5 country – how should then the A5 transporter obtain authorization for such a plan?). It is not clear whether the project developer is required to provide the mentioned plan for his subcontractors. **(Energy Changes)**

RESPONSE: The protocol language has been modified to make it clear that this requirement is only applicable to facilities, not transportation activities. However, the project developer is responsible for attesting via the Attestation of Regulatory Compliance that project material was transported (and imported) in compliance with all applicable laws.

13. In the first paragraph under Section 3.5, the last sentence refers to footnote 21, which is a reference to 40 CFR 63.1206. That CFR section deals with a standard that is applicable to destruction facilities. However, not all “facilities where mixed ODS projects are mixed and sampled” are destruction facilities and, therefore, such facilities cannot be held to that standard. We believe that this language should be clarified to limit the applicability of the last sentence to destruction facilities. **(Hudson)**

RESPONSE: Agreed. The protocol has been modified accordingly.

5 Quantifying GHG Emission Reductions

14. **Article 5 only:** ODS can be considered as end of life (EOL) if recovered within the past 12 months before the project start. It should be taken into consideration that the conditions are not as simple as doing the same within the U.S.. Collection of EOL ODS can be a lengthy process – it means to collect a volume large enough to be economical for transport, export and destruction, by assembling ca 100 grams amounts from one appliance. Enforcement of environmental legislation within the country is usually still weak but once the waste crosses the border, the project developer will very probably face the bureaucracy of the system at its full power which would cause delays. Considering these specific, sometimes unpredictable conditions in A5 countries, this period could be prolonged (e.g. to 24 months?) to allow better opportunity for the project developer to organize and execute the import to USA. You could also create a new baseline scenario of “stockpiled EOL ODS” and exclude it from calculating the project emissions from substitutes. **(Energy Changes)**

RESPONSE: The 12-month limit was originally included in the baseline scenario definition for EOL equipment (#3 in Table 5.1) to help ensure that only project material that could be tracked to recently decommissioned end-of-life equipment is able to use the 100% 10-year cumulative emission rate.

The Reserve appreciates that this time constraint may be difficult for project developers to meet, especially as it might take longer to aggregate enough material for an economically viable project. In response, the Reserve has removed this time constraint.

15. **Article 5 only:** Point 3 of Section 2.4 doesn't specify the type of ODS refrigerant from EOL. This suggests that unless it is recovered from EOL appliances and destroyed (or mixed, in case of mixed ODS) within 12 months it may be well a type of ODS which is not saleable in the country anymore. Problem raises if the project meets unpredictable barriers/delays, spans over 12 months and the collected ODS (or part of it) will become a stockpile of ODS which is not legally saleable on the market. **(Energy Changes)**

RESPONSE: In order for a project to be eligible, it must meet all of the requirements in Section 2 – the project definition in Section 2.2, the eligible ODS in Section 2.3 and the eligible ODS sources in Section 2.4; these sections are additive. Furthermore, EOL ODS cannot “become a stockpile of ODS which is not legally saleable on the market” based on the type of ODS; only government stockpiles of seized ODS would meet that definition. If the ODS from EOL equipment does not meet the 12-month cut-off, it is considered an ODS stockpile that can legally be sold into the refrigerant market.

16. **Article 5 only:** EOL stockpiled is “penalized” by the Protocol by a double reduction of emission reductions: naturally, the stockpiles may apply for 94% of 10-year cumulative emissions only. But according to the current interpretation of the baseline definitions in Table 5.1, ODS from EOL appliances older than 12 months are considered as stockpile and as such must apply the stockpile baseline scenario and account for project emissions from refrigerant substitutes (according to Section 5.2.1, Equation 5.5) although there are no substitutes of any kind. This accounting has a remarkable negative impact to the resulting emission reductions of the project. **(Energy Changes)**

RESPONSE: See response to comment #14. This comment does not need to be addressed, as there is no longer a time constraint for defining EOL material in the baseline scenario.

17. **Article 5 only:** In case when only a part of the total volume of ODS sent for destruction happens to be EOL and the other one is stockpiled already, project developer may have a problem to determine the quantity of each part and document the origin. **(Energy Changes)**

RESPONSE: The documentation requirements detailed in Section 6 were developed to ensure destroyed ODS material is credited conservatively. These requirements have been available since the protocol's adoption in February of 2010 – the Reserve feels that is adequate advanced notice of the type of documentation that must be secured to successfully register a project under our program. Furthermore, the point of origin definitions (Table 6.1) are flexible enough to allow most material to be credited, although it might not be quantified using the most favorable baseline scenario.

18. **Article 5 only:** There is a conflict/ambiguity in requirements on how to justify the origin of ODS and document it. According to Section 5.1, the origin of EOL ODS is tied to the time when the ODS is recovered. Documentation requirements per Section 6.2 involves tracking and record keeping depending on when the ODS have been collected. Thus, if the ODS have been assembled from many quantities of less than 500 lbs the documentation from the aggregation facility (if not older than 12 months) should be sufficient. But to document when the ODS has been recovered to distinguish the EOL from stockpile could mean that project developer must

keep records of volumes far below that. In the case the aggregation facility is collecting ODS from several dismantling facilities who are not project developer's subsidiaries such evidence can be impossible to obtain.

Suggestion: Unifying the sections by adding words "and collected" to Table 5.1, column Refrigerant origin, # 3, as follows: "Used ODS refrigerant recovered from end-of-life equipment *and collected* [emphasis added] during the 12 months prior to the start date." **(Energy Changes)**

RESPONSE: The protocol has been modified to more clearly illustrate the relationship between baseline scenarios and point of origin, as well as the documentation required to confirm both. Please also see response to comment #14.

5.1 Quantifying Baseline Emissions

19. Option B "Default Values" is unclear and, as written, appears to require that an entire shipment would be ineligible. We request that this section be clarified. (pg. 19) **(Hudson)**

RESPONSE: Agreed. The protocol has been modified to make it more clear that the portion/container(s) of ODS deemed ineligible shall be assumed to be full and comprised entirely of the ODS species with the highest GWP based on the composition analysis, not the entire tank that was destroyed. Once estimated, the ineligible portion of ODS is then subtracted from the baseline.

20. **U.S. only:** The draft 2.0 Protocol proposes an annual leak rate for CFC-13 of 9% (Table 5.2). This is at the low end of the range estimated by the 1.0 Protocol workgroup who in 2009 compiled data and input from industry and government experts, including the EPA Vintaging Model. That survey reported an average annual leak rate for CFC-13 between 7 and 33%. **(EOS)**

RESPONSE: As the EPA Vintaging Model does not track CFC-13 as a refrigerant, the Reserve had to use assumptions to derive the emission rate for CFC-13. Our understanding is that CFC-13 is used as a very low temperature refrigerant. Since the system size it is utilized in is uncertain, we assumed a large refrigeration system to be conservative. The California Air Resources Board (ARB) Compliance Offset Protocol for ODS projects utilizes a 9% annual leak rate for large refrigeration systems, in accordance with the impact of California's Refrigerant Management Program. To be conservative and consistent with the ARB compliance protocol, we have used this same 9% annual leak rate.

21. **U.S. only:** Like CFC-11, CFC-113 is used almost exclusively as a refrigerant in centrifugal chillers (RTOC, 2006; Stratus, 2008). The EPA Vintaging Model uses the same annual leak rate for R-113 as for CFC-11. Thus, to calculate the baseline emissions from recovery and resale of R-113, we agree that the same 10-year cumulative emission rate (89%) that is used for CFC-11 can be used in the Protocol (Table 5.2). **[See EOS public comment submission for more detail.] (EOS)**

RESPONSE: Thank you for your comment.

5.1.2 Calculating Baseline Emissions from Shredding and/or Landfilling ODS Foam Blowing Agents

22. **U.S. only:** We recommend that the column entitled 'Percent of released ODS blowing agent not degraded in an aerobic landfill conditions' in Table 5.4 of the U.S. ODS Project Protocol should be modified to take into account the results of the RUK studies. Instead of quoting a value of 5% for the CFC R11, the protocol needs to provide a direct reference to Table 1 of the RUK report from March 2012, which should also be incorporated into the protocol. **[See RALQAA public comment submission for more detail about the studies.] (RALQAA)**

RESPONSE: The findings of this study are of interest to the Reserve. We will continue discussions with the report authors and proponents to understand the study more fully and determine at a later date if the percent of ODS not degraded by anaerobic landfill conditions should be revised.

5.2 Quantifying Project Emissions

23. **U.S. only:** EPA's SNAP (Significant New Alternatives Policy) program lists refrigerants (with their global warming potentials) as acceptable alternatives to CFC-13.

There are a number of low-temperature technologies in widespread use today that are using alternatives to the HFC-based refrigerants, and which have not been submitted for listing under the SNAP program. These third-generation replacements should be factored into the calculation of substitute emission factors in Table 5.5. **[See EOS public comment submission for all listed alternative substances.] (EOS)**

RESPONSE: Most of the substitute emission factors in Table 5.5 were derived using 2012 query results from the EPA Vintaging Model, which compiles information on refrigeration equipment and ODS applications within the U.S. market. EPA does not track the use of CFC-13 as a refrigerant, and so Vintaging Model results were not available to derive a similar substitute emission factor for CFC-13. It is the Reserve understanding that CFC-13 is only used as a very low temperature refrigerant. Data was not available on the size or ratio of substitutes so the Reserve used conservative assumptions in the substitute emission calculation. We assumed the alternative with the highest GWP was the sole alternative (HFC-23) and the relative charge size was a 1:1 ratio. This is in line with the assumptions and substitute emission factor used in ARB's Compliance Offset Protocol for ODS projects.

The Reserve currently has no mechanism to gather information on the use of these alternatives in the U.S. market. If the Reserve is able to secure better information on the use of non-HFC-based refrigerants, it may update this emission factor in the future.

5.3 Deduction for Vapor Composition Risk

24. From the explanation of the effect of vapor from an ineligible refrigerant, it appeared that the 5% reduction was "overkill" in trying to be conservative. It appeared that the ineligible gas needed to

approach 100% and the eligible gas near 0% to get close to a 5% distortion. We recommend that the deduction be a 3% deduction in place of the 5%.

In most cases when the ineligible gas is contained in a mixed batch it does not exceed even 50% of the mixture. We recognize the goal of being conservative but think that 5% is too high. **(RemTec, Coolgas)**

RESPONSE: Based on stakeholder feedback and continued analysis, the Reserve has determined it appropriate to further refine the vapor composition risk deduction in order to more closely match the deduction with the potential risk of overstatement. After additional stakeholder consultation, we have revised the deduction for vapor composition risk to account for the liquid fill level of the tank. It also sets minimum thresholds for the concentration of the pertinent constituents before the deduction must be applied. This new policy will more closely align the deduction with the potential risk of overestimation.

25. Coolgas believes that Section 5.3 should include a minimum concentration threshold of ineligible high pressure chemicals that must be reached before the 5% deduction is applied to the emission reductions. Coolgas suggests that a minimum concentration threshold be included in the existing language of the second paragraph of Section 5.3, as follows (additional language is bolded and bracketed):

“To address this risk, a project container that holds an eligible low pressure ODS and **[also holds]** an ineligible high pressure chemical (e.g. HCFC-22) **[in a concentration of greater than 5%]** shall have a 5% deduction applied to the emission reductions generated by the destruction of the container. Any ineligible chemical with a boiling point below 32°F at 1 atm is considered high pressure.” **(Coolgas)**

RESPONSE: Please see response to comment #24.

26. ECC recommends removing this section in its entirety.

After review of the potential magnitude of the risk of over-crediting due to differences between liquid samples and actual contents, ECC does not believe that the this deduction is necessary or useful.

Under the revised verification requirements, verifiers are required to insure that source and eligibility documentation for container contents match up to reported liquid samples. This process should ensure that large deviations between actual contents and sampled contents do not occur.

Further, after review of the charts presented by CAR staff at the April 10th Public Workshop, it is apparent that the risk addressed in this section is only potentially material (although as noted above, verification should remove this risk) in cases where tanks are delivered substantially less than full (cited examples included tanks capable of holding approximately 33,000-35,000 lbs of materials which were filled with 15,000 and 30,000 lbs). ECC believes that if CAR does move forward with this unnecessary discount, that it should not apply to tanks which are filled to capacity levels of 80% or more. Capacity and Fill, for this purpose, should be determined based on type and weight of materials rather than by direct volumetric measurement which may not be available or independently ascertainable. Capacity should be stated not as Total Water Capacity, but as the recommended 80% of Water Capacity adjusted for the specific density of

the materials destroyed. (ECC)

RESPONSE: The verification of documentation and sample results can only confirm the composition of the liquid contents of a container. This section is intended to address the risks associated with unknown composition of the vapor contents of a container. Based on stakeholder feedback and continued analysis, the deduction for vapor composition risk has been refined to account for fill level and provide minimum thresholds of applicability. We believe that this new policy will protect against the risk of overestimation without being overly conservative.

Please see response to comment #24.

27. The language that currently describes the composition of a tank that would be subject to a 5% deduction is unclear for a couple of reasons.

First, it was clarified at the NACW conference ODS meeting that there is a single scenario (defined as #2 below) that defines the composition that would be subject to the 5% discounting. However, the language as written would suggest 2 scenarios:

- Scenario 1 – eligible low pressure ODS + ineligible high pressure (concentration thresholds undefined)
- Scenario 2 – eligible low pressure ODS in at least 1% concentration + eligible high pressure in any concentration + ineligible with higher pressure and concentration than the eligible high pressure ODS

Please reword the language such that it is clear that Scenario 2 is the only project where the discount would be applied.

Second, it is unclear how the project developer is to choose the eligible high-pressure refrigerant concentration if several high pressure eligible refrigerants exist within the container in varying concentrations. Please clarify which concentration of eligible high pressure refrigerant the developer is to refer to when determining the “eligible high pressure ODS” that is to be compared to the higher pressure ineligible chemical. (EOS)

RESPONSE: We apologize if there was confusion during the public comment meeting; the two scenarios described above are both subject to the vapor risk deduction. However, you are correct that the language was not clear enough for mixes with multiple species that meet the broad categories defined in this section. The protocol has been amended to clarify how the policy is to be applied in these situations.

28. **U.S. and Article 5:** Please clarify whether there is a *de minimis* concentration of ineligible high pressure chemicals at which the five percent discount is not required (similar to what is identified for the eligible ODS species). (FE)

RESPONSE: Please see response to comment #24.

29. SDS feels the vapor composition risk is small and exists only in special circumstances that would be better addressed in a different manner.

The Worst Case Scenario from the [public workshop] presentation is alarmist. R23 has a vapor pressure in excess of 600 PSI at 70 degrees F. Presenting R113 and R23 in the same vessel at

the volumes shown would be extremely difficult.

The current language has inadequate limits and thresholds. **[See examples in SDS public comment submission.]** The scenarios described in the presentation have very little risk until the vessel is mostly empty or the ineligible gas is extremely high.

SDS suggests that mixtures and combinations of gas that pose the highest risks be singled out. It seems unfair to project developers to receive a substantial deduction for mixtures that have low risk of over crediting. SDS suggests the deletion of this section. **(SDS)**

RESPONSE: The mixture of R113 and R23 that was presented in the public comment meeting was a worst case scenario. Staff discussed at the time that this was a mixture that we did not expect to see, and thus the vapor risk deduction is not nearly large enough to account for the risk of this unlikely scenario. The other graphs presented at the meeting represented mixtures that the Reserve has already seen in projects, and they present a risk of material overstatement at fill levels which are not unreasonable. It would not be possible to develop a comprehensive list of every potential risky mixture due to the number of variables involved.

Please also see the response to comment #24.

30. Second paragraph: There needs to be some minimum threshold percentage of the ineligible product before the 5% reduction should apply. In this regard, we would recommend that at threshold percentage for the low pressure eligible ODS be 20% of the total quantity before the 5% reduction would apply. **[See Hudson public comment submission for more detail.] (Hudson)**

RESPONSE: Please see response to comment #24.

31. The third paragraph refers to “an ineligible chemical with a higher pressure than the eligible ODS.” We believe that that sentence should read “...an ineligible chemical with a higher pressure than the eligible high pressure ODS.”

Also, this provision does not address a situation where there are two or more “species” of high pressure eligible ODS mixed with a low pressure eligible ODS. In such a case, the section does not specify which high pressure eligible ODS would be used for determining whether the 5% reduction should apply. We recommend that additional language be added to provide that, where there are 2 or more eligible high pressure ODS components, the 5% reduction would apply only if the non-eligible chemical is higher in pressure than the eligible high pressure ODS present in the highest concentration.

The 1% standard for low pressure eligible ODS, we submit is too low. As written, if there is no quantity of low pressure eligible ODS present, then there is no 5% reduction (penalty), but if there is only 1% of the low pressure, then the 5% reduction will apply. We submit that tying the reduction to a 1% level is not appropriate. We submit that a minimum concentration should be no less than 10%. **(Hudson)**

RESPONSE: Please see the responses to comments #24 and #27.

6.2 Point of Origin Documentation Requirements

32. EOS is in agreement with the changed definition of the stockpile to refer to February 3rd 2010.
(EOS)

RESPONSE: Thank you for your comment.

33. We recommend changing “Refrigerant ODS stockpiled *prior to February 3, 2010*” to “Refrigerant ODS stockpiled *for greater than 24 months*.” [Emphasis added.] We suggest this change because February 3, 2010 is no longer a relevant date as Version 1 is not mentioned in this revised Protocol.

Without this change, there are stockpiles created out of necessity of not having all the detailed record keeping data, that were being held for the 24 month rule, that will never be eligible (i.e. orphans without the chance of being eligible). In the absence of a GHG reduction project, this material may be illegally vented or recovered for re-sale into the refrigerant recharge market. This is the same rationale why the Version 1.0 included a greater than 24 month eligibility for stockpiles - so that material without the detailed point of origin could become eligible.

If this recommendation is not accepted, please at least change “February 3, 2010” to “the adoption date of Version 2.0.” Starting with the adoption date of this protocol will allow those stockpiles that were started prior to this new eligibility requirement and in accordance with the previous Version 1.0 of the Protocol, to be eligible and stockpiles starting after this date will not be eligible.

Stockpiles earlier than February 3, 2010 should have already been destroyed but if not they would still be eligible because they are started prior to the effective date of Version 2.0 Protocol date.

This requested change of the effective date will give time for operational changes in the way many developers acquire material. They will not acquire material that does not have the required documentation as desired by CAR. It is never the intent of a developer to hold material for 24 months prior to destruction but it was the “fall back” position and the only way the material could be eligible if detailed documentation is not available.

There is potentially a large financial investment in this material that was acquired in good faith with the “fall back” position in mind that could have disastrous consequences if all of a sudden the 24 month rule were to be eliminated. **(RemTec, Coolgas)**

RESPONSE: When Version 1.0 of the ODS Protocol was adopted on February 3, 2010, the stockpile definition was meant to provide an avenue for eligible materials that had been stockpiled prior to the publication of our documentation requirements to be destroyed. At that time, a project developer could not have known what evidence would be required to prove eligibility of their material. However, these documentation requirements have now been publicly available for more than 24 months. It was not the intention of the original protocol to allow for undocumented material to be redefined as a stockpile simply by waiting for 24 months.

34. “All data must be generated *at the time of collection* from the point of origin. Documentation of the point of origin of ODS shall include the following:

- Facility name and physical address
- Point of origin zip code
- Identification of the system by serial number, if available, or description, location, and function, if serial number is unavailable (for quantities greater than 500 pounds)
- Serial or ID number of containers used for storage and transport” (pg. 33)

There are many acceptable reasons why the documentation for point of origin is not available. In many cases it is the chain of getting material from the contractor who recovers the material to the project developer. As an example, a chiller holding 600 lbs of used eligible ODS may have been recovered in 2010. That contractor may have sent it to a branch wholesaler for proper return of ODS without the knowledge that it would be eligible for offsets and therefore no paperwork or point of origin information as required above is available.

For legitimate competitive reasons, many businesses refuse to provide information about their customers therefore the information requested in the protocol (above) is withheld. The 24 month rule in Version 1 is the only way this material may be eligible. After the adoption of this new Version 2, then the 24 month rule is no longer valid and this type of material may be vented to the atmosphere. **(RemTec, Coolgas)**

RESPONSE: Please see response to comment #33.

35. “All data must be generated *at the time of collection* from the point of origin.” (pg. 33)

Why are the words “at the time of collection” italicized? This causes confusion as some times it is necessary to “backtrack” and find the information required. This is especially the case when the material comes to a developer through several layers of a supply chain (local contractor branch to contractor region office to branch wholesaler to regional wholesaler to developer). The italics raises questions as to the eligibility to developers and verifiers of any material if the point of origin information is not recorded on a piece of paper that was created at the exact collection site at the exact time of collection. We recommend removing this sentence in its entirety to avoid confusion. **(RemTec, Coolgas)**

RESPONSE: Italicization was used to add emphasis to ensure that collection and documentation occurred simultaneously. We realize that “collection” could be interpreted in a number of ways and have revised the language throughout the section to clarify when and where documentation should be created for the various points of origin. The requirement that documentation be generated at the point of origin remains, but the temporal element of when the documentation is created is now more nuanced.

36. **Table 6.1, Identification of Point of Origin:** ODS: “Refrigerant ODS quantities greater than 500 lbs,” Defined Point of Origin: “Site of installation where ODS is *removed*.” [Emphasis added.]

We recommend replacing “removed” with “recovered.” The word “recovered” from “recovery” is defined in the Glossary of Terms. **(RemTec, Coolgas)**

RESPONSE: Agreed. The protocol has been modified accordingly.

37. In the two last paragraphs on page 32, we recommend replacing the word “collected” with “recovered.”

“For ODS *collected* by service technicians...” [emphasis added], and

“The project developer must provide documentation tracking the ODS back to a point where it was either a) contained or *collected* as a quantity of less than 500 pounds, or b) *collected* by a service technician as a quantity of greater than 500 pounds.” [Emphasis added.] (**RemTec, Coolgas**)

RESPONSE: Agreed. The protocol has been modified accordingly.

38. “ODS purchased from DLA Disposition Services must have documentation to show that the ODS was produced prior to the U.S. production phase-out and that it could legally be sold in the U.S. refrigerant market. Documentation must also show that the material was not sourced from U.S. Customs.” (pg. 34)

Appendix B.1 to the U.S. ODS Protocol suggests that ODS sourced from U.S. Customs is not available through the DLA Disposition Services (DLA). Is the intent that if a project developer can demonstrate that ODS is sourced from the DLA, no additional evidence is necessary to specifically demonstrate that the ODS is not sourced from U.S. Customs? If not, some additional guidance would be helpful in order to better understand what is considered acceptable documentation. From our experience, it can be difficult for project developers to provide evidence demonstrating conformance with a negative requirement (e.g., that ODS was not sourced from U.S. Customs).

Similarly, we are concerned that it may be difficult for project developers to obtain documentation from the DLA related to ODS production date and the legality of ODS being sold into the refrigerant market. Please further clarify what type of documentation the Reserve anticipates being available from the DLA. (**FE**)

RESPONSE: The protocol has been modified to clarify what documentation is needed for materials sourced from DLA auction. Further conversations with the U.S. government have indicated that most of the documentation mentioned above is unnecessary. The Reserve expects any material obtained from the DLA would be accompanied by documents showing that it was purchased from an official DLA auction, and a bill of sale with specifications about the material purchased.

39. Second paragraph under Table 6.1: The second paragraph under the chart refers to “the holding facility where *several small quantities* were combined and exceeded 500 pounds in aggregate.” We suggest simply substituting the words “2 or more containers.” [Emphasis added.] (**Hudson**)

RESPONSE: Agreed. The protocol has been modified accordingly.

6.6 Concentrated ODS Composition and Quantity Analysis Requirements

40. Sections 6.4 and 6.6: Requiring that scales are within 1% accuracy.

ECC believes that there is an opportunity to utilize an industry standard which instead would provide for a more conservative outcome as well as bringing the protocol into line with other

types of facility requirements.

ECC's understanding is that the industry standard for scale calibration is that the scale be calibrated within 3 Grads in order to be "Legal for Trade." A Grad is one scale increment. To illustrate the impact of utilizing the 3 Grad requirements, consider a 100,000 lb. scale which is off by 1%. When measuring an example 50,000 lb. load (truck and full container), such a measurement could be off by 500 lbs. Utilizing a 3 Grad rule, the same 100,000 lb. scale, using 20 lb. increments, can be off by only 60 lbs. This appears to be a substantially more accurate rule, as well as being appealing from a simplicity perspective. **(ECC)**

RESPONSE: We agree that the accuracy requirement, as written, was not appropriate for this application. The protocol has been modified to reflect the industry standards for certification and calibration.

41. Sections 6.4 and 6.6: Requiring that scales are within 1% accuracy.

There are 46 States that require NTEP Certificate of Conformance for trade weights and devices in service. These "Legal for Trade" requirements are well established and more restrictive than the protocol. We suggest the protocol adopt the same requirements the local supermarket to the local scrap yard must follow when it comes scale certifications. The current limit of 1% is excessive especially considering the spotlight on over crediting vapor composition risks.

Since destruction facilities are billing by weight they are already subject to this requirement. **(SDS)**

RESPONSE: Please see response to comment #40.

42. Scales: Accuracy of within 1% of reading: In our opinion, even this proposed increase in the precision of the scales used will not rule out the possibility of weighing errors. We believe that it would be better to specify the maximum mass with which the scales can be loaded (up to x kg) and to specify a measurement accuracy in absolute terms (e.g. $\pm 0.1\text{kg}$ or, equivalently, $\pm 100\text{g}$).

In the case of a weighbridge (or vehicle weighing platform) with a capacity of many tonnes, the specification "accuracy of within 1% of reading" does not represent an adequate description of the requirements to be met by the scales. **(RALQAA)**

RESPONSE: Please see response to comment #40.

43. "If a sample is tested and does not meet one of the requirements as defined above, the project developer may elect to have the material re-sampled and reanalyzed. While there is no limit to the number of samples that may be taken, the analysis results of all samples must be disclosed to the verification body."

Further clarification is necessary regarding how multiple sample results are considered for the purpose of quantification of emission reductions. It is unclear whether the intent is that failed samples are disregarded entirely, or factored into the determination of emission reductions in some way. If there is no limit to the number of samples that may be taken, this clarification is necessary in order for verification bodies to understand the implications and risks associated with multiple samples. **(FE)**

RESPONSE: Agreed. The protocol has been modified to provide more specific guidance on the consideration of multiple sampling events.

44. “4. The technician must ensure that all valves between the container and the sample port are open.” (pg. 36)

ECC would propose the following wording instead: “4. The technician must ensure the sample is representative of what is contained in the vessel. All valves between the sample point and the vessel’s interior must be open for a minimum of 15 minutes before the sample is taken.” **(ECC, SDS)**

RESPONSE: Agreed. The protocol has been modified accordingly.

6.6.1 Analysis of Mixed ODS

45. “3. The container must have sampling ports to sample liquid and gas phase ODS” (pg. 38)

ECC recommends removing this statement. Since gas sampling is not required in the protocol, this appears to be an error. **(ECC, SDS)**

RESPONSE: Agreed. The protocol has been modified accordingly.

46. “4. The sampling ports must be located opposite each other (i.e. both ports cannot be at the same end of the container)” (pg. 38)

ECC believes that this section intended to address mixing ports rather than sampling ports. There is no requirement for a gas sampling port, nor reason for specifying its location. If the intent in this sentence was to specify that the mixing ports were located opposite/across/not near each other, ECC agrees that the mixing ports should not be in the same section or location on the tank- they should be on opposite sides/ends of the tank (i.e. top and bottom or left and right). **(ECC)**

RESPONSE: The protocol has been modified to clarify this issue. The intent of this section is that the tanks shall have liquid and vapor ports that may be used for mixing, rather than sampling. At this time, only the liquid port shall be used for sampling.

47. “4. The sampling ports must be located opposite each other (i.e. both ports cannot be at the same end of the container)” (pg. 38)

SDS believes there is no language change necessary. If the mixture is “mixed” the location the sample is taken is irrelevant. **(SDS)**

RESPONSE: Please see response to comment #46.

48. “3. ...Alternatively, circulation may occur at a rate that is less than 30 gallons/minute, as long as the ODS is circulated continuously for a minimum of 8 hours” (pg. 38)

ECC proposes that circulation of a volume equal to two times the container contents should occur either 1. At a rate of no less than 30 gpm; or 2. In 4 hours or less.

ECC suggests that there is a danger in providing no lower limit or requirement to the speed of circulation.

Mandating a time in which the mixing of the required volume must occur allows for a wide variety of container sizes, volumes, and valves, while still placing a lower threshold on the mixing rate which will help ensure complete mixing.

The following example container volumes illustrate the proposal:

½ ton Cylinder (119 Gallons)	Mix total = 238 gallons	Min. Mix Rate = .99 GPM
3000 Gallon Trailer	Mix Total = 6000 Gallon	Min. Mix Rate = 25 GPM
5000 Gallon ISO	Mix Total = 10000 Gallons	Min. Mix Rate = 42 GPM

[See SDS public comment submission for more detail.] (ECC, SDS)

RESPONSE: The intent of this section is to require adequate mixing of the ODS to ensure that the liquid sample is representative, as well as to provide flexibility in the type and capabilities of the equipment used for this mixing. The protocol has been modified with a mixing time limit to ensure that a minimum mixing rate is achieved.

49. As currently worded in V.1.0, any pump would be sufficient for mixing. We suggest that a minimum of 15 gallons/minute threshold be adopted for the 8 hour mixing event, which would effectively achieve the same results as required if using the 30 gal/minute pump and a standard 33,000 lb capacity mixing tank. **[See Hudson public comment submission for more detail.] (EOS, Hudson)**

RESPONSE: Please see response to comment #48.

50. As currently proposed for V.2, if the mixing and sampling are conducted at the destruction facility, then this sample may be used to satisfy the requirements of Section 6.6. If the mixing and sampling do not occur at the destruction facility, then the most conservative composition analysis from the mixing facility sample shall be used for the quantification of emission reductions.

Please confirm that the sample used to satisfy the requirements of section 6.6 is in fact the most conservative of the **two samples** that must be used to determine CRTs when mixing and sampling are conducted at the destruction facility. As worded, it would suggest a single sample is all that is required to determine CRTs when mixing and sampling are conducted at the destruction facility. **(EOS)**

RESPONSE: The protocol has been modified to clarify this issue. For all mixed ODS projects, two samples are required to be taken at the mixing facility. If this facility is also the destruction facility, then no further sampling is necessary. The most conservative composition analysis between the two mixing samples shall be used for the quantification of emission reductions.

51. As currently proposed for V.2, the sampling ports must be located opposite each other (i.e. both ports cannot be not at one the same end of the container or the other).

Liquid and vapor ports are typically located side-by-side at the bottom of the tank where they

are easy to access. A very common tank design is to locate the liquid intake at the bottom center of the tank with a straight pipe direct to the liquid port. The vapor port is then located directly beside the liquid port and a vapor pipe is run either externally to the top of the tank or internally to the top of the tank with an inverted dip tube. In either case, the liquid and vapor port exist on opposite sides of the tank, which would facilitate adequate mixing.

To clarify, we suggest the following language (in italics) to describe an eligible mixing tank:

- The container has no solid interior obstructions
- The container was fully evacuated prior to filling
- The container must have liquid and vapor ports
- The *liquid and vapor* ports must be located *in the middle third of the container*
- The container and associated equipment can circulate the mixture via a closed loop system from the *liquid to the vapor port (EOS)*

RESPONSE: The protocol has been modified to clarify this issue. This guidance is intended to specify the location of the intake for the mixing port, and not necessarily the mixing port itself. The intake for the liquid mixing port shall be at the bottom of the tank, and the intake for the vapor mixing port shall be at the top of the tank. Both intakes shall be located in the middle third for horizontally-oriented tanks.

52. The description of the requirements for the mixing tank is unclear and inaccurate. All refrigerant tanks have a liquid port and a vapor port. The vapor port draws from the top portion of the tank (the vapor space) and the liquid port draws from the bottom of the tank. The proximity of the two ports is irrelevant. Many tanks use dip tubes such that a liquid port located on the top of a tank will have a tube going to the bottom of the tank to draw liquid. Conversely, a vapor port can have a reverse dip tube and be located on the bottom of the tank. The procedure needs to simply require that the liquid and vapor ports be located in the center third of the tank and that the ODS be pumped from the liquid port to the vapor port. Therefore, we suggest that this procedure should read as follows:

1. The container has no solid interior obstructions.
2. The container was fully evacuated prior to filling
3. The container must have sampling ports to sample liquid and gas (**vapor**) phase ODS
4. The sampling ports must be located in the middle third of the container'
5. The container and associated equipment **should** circulate the mixture via a closed loop system from the **liquid port to the vapor port. (Hudson)**

RESPONSE: Please see response to comment #51.

8.6 Verification Site Visits

53. During the NACW conference, it was clarified that a site visit to an additional facility of the verifier's choice be required per reporting period and not per project as stated. We feel an additional site visit per project would be appropriate, but that that the language in the current version of the protocol is sufficient in that it allows verifiers to initiate site visits if they deem it necessary in the context of the project risk assessment. **(EOS, Hudson)**

RESPONSE: As stated in the protocol, the new requirement is for one additional site visit

per project, not per reporting period. Each verification body shall conduct a risk-based assessment to determine whether additional site visits are necessary for any given reporting period.

54. “For each reporting period, the required site visits must have occurred no more than 12 months prior to the end date of the reporting period.”

During the public stakeholder meeting on April 10, 2012, the Reserve indicated that the intent of this requirement is that verification bodies would perform “one additional project facility” site visit each reporting period. While we believe it is necessary to allow for verifier judgment regarding the site visits, we assert that in many cases additional site visits each reporting period (as opposed to once per project) would not add value to the verification process. In addition, we recommend that the Reserve revise the language in this section to be more consistent with its intent. **(FE)**

RESPONSE: Please see response to comment #53.