SUMMARY OF COMMENTS & RESPONSES
DRAFT MEXICO ODS PROJECT PROTOCOL VERSION 1.0

Three sets of comments were received during the public comment period for the Climate Action Reserve (Reserve) draft Mexico Ozone Depleting Substances (ODS) Project Protocol Version 1.0. Staff from the Reserve provides responses to the comments below.

The comment letters can be viewed on Reserve's website at http://www.climateactionreserve.org/how/protocols/mexico-ozone-depleting-substances-project-protocol/.

COMMENTS RECEIVED BY:

1. Rodolfo Garza, Quimobásicos S.A. de C.V. **(Quimobásicos)**
2. Thomas Grammig **(Thomas Grammig)**
3. Ytzel Manjarrez, Ecofrigo S.A. de C.V. **(Ecofrigo)**

General Comments

1. **Required Protocol inputs:**

   - Programa Especial de Cambio Climático 2014 – 2018, carbon tax, national NAMA registry with 23 NAMAs
   - Mexican refrigerator replacement programmes, FIPATERM, PFAEE to ELAP (70% of replaced units 10-14yrs old, 30% >15yrs old)
   - 90% of refrigerator sales are from Mabe, Whirlpool and Samsung, all with large production of all possible technological options, 2012: total stock 19.1 mio, annual sales 2.55 mio
   - Multilateral Fund (MLF) financing of ODS destruction and HPMP
   - for CAR Article 5 ODS Protocol, two projects were realized in Mexico (#691, #826); CAR US ODS Protocol has not yet been used for foam blowing agent, other Mexican CAR Protocols (biogas) have been implemented in 8 projects so far, all small-scale
   - Centros de Acopio y Destrucción (CAyD), created in 2006, recovered on average 30.8 gr/fridge from 1.59 mio fridges 2009-12 (15% of all eligible households), ~26% of the total CFC-12 refrigerant. The recovered gases are treated in 14 Centros de Reciclado de Refrigerantes, like CAyD companies authorized by Semarnat and supervised aiming at World Bank environmental safeguard standards.

   [See references for above information in public comment submission.]

   These six dimensions of the Mexican context should be addressed in the design of a Mexico ODS Protocol. Even so it is challenging to integrate these factors systematically, these six are essential. They contain the potential volume of abatement, the possible technologies, the firms and their past behavior. Even so volume, costs and incomes cannot be predicted, most of these factors can be approximated to anticipate the projects such a Protocol invites.

   The first two dimensions are needed for the demand side of a Mexico ODS Protocol, those factors determining the flow of End-of-Life appliances. The dominance of three producers is relevant because their shifts to HCFC-141b and to HFC-134a determine the volume of these and the declining CFC volumes in the End-of-Life appliances arriving at CAyDs in the next years. The Mexico ODS Protocol applies the Montreal Protocol's TEAP 2002 recommendations for destruction and could furthermore integrate the ODS export funding and destruction technology funding and results in the recent years since TEAP 2002. When ALL Montreal Protocol funded ODS exports are using CAR's Article 5 ODS Protocol, then the impact of a Mexico ODS Protocol on Montreal funding can be anticipated. Some National Ozone Units decided to destroy CFC domestically and others not, CAR could be cognizant and even refer to the criteria and amount of Montreal funding. The last two dimensions account for firms and their behavior, the users of a Mexico ODS Protocol, whose recycling work is partly paid by SENER, supervised and controlled by SENER and SEMARNAT. The high variation in recovery rates (endnote 5) indicates that the possible impact of a Mexico Protocol will be very uneven.
   (Thomas Grammig)

   RESPONSE: Thank you for your summary of some additional context (and associated references) to be included in the Background Section (2.1) and background on performance standard development (Appendix B) of the protocol. The Reserve has made a number of revisions to these two sections to expand upon the background previously provided, per this recommendation. As part of its analysis, the Reserve also examined the Mexican refrigerator

and appliance recycling programs, as well as funding received by Mexico and its National Ozone Unit (known as UPO in Mexico, which is housed within SEMARNAT) from the Multilateral Fund, UNIDO, and UNDP. In response, we provided some additional background information on these activities to provide further general context for the protocol.
In response to the final comment about high variation in recovery rates of ODS, the Reserve is aware of this variation, but it is not directly addressed in the protocol. As the protocol quantifies emission reductions based on quantity (mass) of ODS destroyed, there is an incentive for appliance recyclers to minimize ODS leakage, maximizing the potential ODS available for destruction.

2 The GHG Reduction Project

2. Is it possible to extend the source to other countries? Or can the destruction facilities in Mexico participate in other protocols for countries where there are no destruction facilities? **(Quimobásicos)**

   RESPONSE: Unfortunately, because of current provisions in Mexican law, it is not possible to extend the source of ODS to other countries for destruction in Mexico. CFCs are considered a hazardous waste in Mexico and are covered under the General Law for the Prevention and Management of Waste (Ley General para la Prevención y Gestión Integral de los Residuos, LGPGIR). Chapter VII, Article 86 of the LGPGIR specifically states that the import of hazardous waste to Mexico shall be allowed *only* if that hazardous waste is intended for reuse or recycling.[1] In other words, the import of CFCs for the sole purpose of destruction at a facility in Mexico is not permitted by Mexican law at this time. However, if Mexican law were to change to allow for the import of ODS to Mexico, specifically for purposes of destruction, in the future, imported ODS could become an eligible source.

   ODS from Article 5 countries where there are no destruction facilities may use the Reserve's Article 5 Project Protocol, which allows for that ODS to be imported to the United States for destruction.

2.3 Eligible ODS - Inclusion of Foams

3. The proposed Protocol excludes all blowing agents extracted from foam out of excessive caution. End-of-life appliance foam in Mexico comprises CFC-11, HCFC-141b, HFC-134a, HFC-245fa and cyclopentane. These five substances should not be treated as a group because they have little in common and there is no reason for treating them as a group. Instead, specific factors can be considered for including/excluding blowing agent CFC-11, other reasons for HCFC-141b and yet another set for blowing agent HFC's possible eligibility.

   Regarding blowing agent CFC-11, most countries have effectively stopped producing or importing it in 2008, ahead of the Montreal Protocol deadline 2010. Seven years later, it is not a question of caution to prevent new CFC-11 production as justification for excluding blowing agent CFC-11.

[1] Ley General para la Prevención y Gestión Integral de los Residuos. ("General Law for the Prevention and Management of Waste"). Published as a New Law in the "Diario Oficial de la Federación" 8 October 2003. Latest reforms to the current text published in the "Diario Oficial de la Federación" 12 May 2014. Accessed 31 March 2015. Available at: http://www.semarnat.gob.mx/leyes-y-normas/leyes-federales.

For blowing agent HCFC-141b, the Mexico HPMP **[see reference in public comment submission]** stage I used 2.5mio$ for the conversion of Mabe's production to cyclopentane as blowing agent, as well as in three commercial refrigeration companies. Therefore Whirlpool is the last remaining HCFC-141b user as foam blowing agent in Mexico. The Government of Mexico has committed to reduce HCFC consumption by 35% in 2018, 50% in 2020 and 67.5% in 2022.

This accelerated phase-out should be included in Table 2.1 of the proposed Protocol instead of the Article 5 schedule.

The Mexico HPMP also comprises a national licensing and quota system for imports and exports of HCFC, and a specific customs tariff for each HCFC. **[See reference in public comment submission.]**

If the National Ozone Unit in Semarnat operates this system effectively, it is not possible for virgin HCFC-141b to be fraudulently declared recovered blowing agent, besides the fact that with the GWP of 700, the income from fraudulently obtained CRT certificates is in $/kg the same as the production cost of HCFC-141b. Therefore there is insignificant or no incentive for fraud with HCFC-141b even if the National Ozone Unit were unable to effectively run the licensing and quota system.

HCFC-141b eligibility in Mexico should be considered with similar merit as HCFC-141b eligibility in the US ODS Protocol.

Finally, recovered HFC-134a can be credited with avoided energy consumption during the production of new HFC-134a. **(Thomas Grammig)**

RESPONSE: The Reserve recognizes that there is significant potential for emission reductions from foams in Mexico if they were to be included in this protocol and that currently most foams are being sent to landfills. However, the Mexico ODS Project Protocol was, from its inception, meant to be an adaptation of the Reserve's Article 5 ODS Project Protocol. Foams are not eligible in the Article 5 protocol due to significant baseline and quantification challenges. Our budget and timeline for the Mexico protocol adaptation did not allow for an expansion of the scope of the protocol, which would have required adapting the quantification methodology for foams to Mexico, assessing whether to add additional eligible ODS, and conducting analysis necessary to establish a Mexican foams performance standard. Because of this, foam ODS will not be included in the protocol at this time. The Reserve agrees that it would be highly beneficial to include foams in the future, and is currently seeking resources to allow for the expansion of the Mexico ODS Project Protocol – and possibly the Article 5 protocol – to include ODS in foams.

Finally, HFC-134a is currently assumed to be the dominant substitute for refrigerants in the protocol; additional analysis would be needed to explore whether this protocol (and/or the Reserve's other ODS protocols) might be able to incentivize recovery of HFC-134a.

4. We urgently recommend including the gases contained in foams. At present time, there is no responsible environmental management of this issue and we believe that their inclusion would be an excellent support for the country if foams are treated as an environmental concern.

   Current Situation: In the country, more than 500,000 refrigerators are discarded annually, foams included in those refrigerators are sent to landfills (most of them are open areas close to

schools, commercial and residential areas). Most of these landfills also include garbage and everything is compressed with heavy machinery. The big problem is that most of these gases are released with environmental damage.

Recently, the government of DF, together with Mario Molina Center, developed a Climate Action Program. Among the actions considered for implementation is the scrapping of refrigerators mentioned, in order to reduce the potential emissions of hydrofluorocarbons (HFCs) and energy consumption associated with the use of obsolete-technology coolers. It is intended to provide direct support for the scrapping of old refrigeration units (with 10 or more years of use) and replacing them with appropriate equipment using refrigerants and with better energy efficiency. This action is focused on the domestic sector. The measure consists of a bond to cover a percentage of the price of the appliance to change the old refrigerator.

The Ministry of Environment (SEDEMA), through the program Reciclatrón, disables the unit for use and redeems the refrigerant compound for treatment. The use of HFCs in refrigerators and air conditioners is a major source of CO_2e (1,164,000 t) and a contribution of 3.8% of the total inventory. In Mexico, around 6 million old refrigerators over 2 years (CFC11) in foams are estimated. The goal of this program is mitigation of 1.2 million tCO_2e by 2020. **(Ecofrigo)**

RESPONSE: The Reserve appreciates the additional context the commenter has provided on the stock of foams in Mexico and current business-as-usual disposal practice, as well as the additional resources provided on landfills, the landfilling practices of foams, and the associated emissions. These resources will prove useful if and when the Reserve is able to include foams in the protocol – please see response to Comment #3.

5. Impact of Article 5 ODS Project Protocol: In five years, the Article 5 Protocol has brought End-of-Life CFC only from Mexico for destruction into the US, all other imports to the US from other countries (Nepal and India) have been virgin CFC stocks. The Mexican infrastructure for refrigerator dismantling has not responded to the incentive from the Article 5 Protocol because the CFC-12 recovered is only 26% whereas >80% is technically feasible (with currently used equipment, funded in 2006 by Montreal Protocol's MLF). The only independent assessment of the CAyDs **[see reference in public comment submission]**, funded from the World Bank and KfW, concluded that the variation in recovery is due to operational practices.

   Only in Brasil and Ghana new automatised refrigerator recycling plants currently recover all ODS (refrigerant and blowing agent, sometimes called demanufacturing or stage I and II recycling) and one of three plants in Brasil has been issued "Swiss Charter Units" (similar unit as CRT) **[see reference in public comment submission]** in 2013 for destroying the recovered ODS. Both in Mexico and in Brasil, electric utilities are spending large funds to replace old refrigerators. In Mexico ELAP included 50mio$ from CTF and 100mio$ from an IBRD loan, and at present the Mexican government pursues a second phase with the CTF. ELAP has paid 18 US$/refrigerator **[see reference in public comment submission]** to the CAyDs for the dismantling and in addition, CAyDs get 8 US$/kg CFC recovered if >96%pure. Institutional barriers are the likely reasons why no automatised recycling plants appear in Mexico compared to Brasil (value of other recycled fractions assumed similar, Brasil also got recovery equipment from MLF like Mexico, both countries have entrepreneurial private sectors, number of fridges >10yrs similar). Efforts and initiatives in Mexico by several members of the workgroup that produced US ODS Protocol, by strong carbon traders and manufacturers have not succeeded so far. Additional incentives are necessary to reach all End-of-Life ODS in Mexico.

The low recovery in Mexico seems congruent with the high recovery in Brasil not bringing ODS to destruction in the US. Since the Article 5 Protocol's exclusion of foam might be structurally counterproductive by preventing such recycling plants as in Brasil and Ghana, its specific extension to Mexico could create incentives that are more likely to be effective in the Mexican context. Against this conclusion, one can assert that the number of Article 5 ODS projects is too small to draw conclusions, or consider complex interferences **[see reference in public comment submission]** between CAR and Montreal disposal funding (for example that UNDP in Ghana is politically more influential). **(Thomas Grammig)**

RESPONSE: Thank you for sharing this perspective on the impact of the Article 5 Project Protocol, which will be duly noted as we consider future expansions of the Mexico ODS protocol. Please see the response to Comment #3.

6. Another fundamental eligibility aspect is the possible crediting for foam being burnt in waste-to-energy plants. This is standard practice in the US and would provide incentives to operate the current CAyDs in Mexico, bagging foam and destroying it in Mexico. Since it would be difficult to establish what foam blowing agents are in a large mass of foam, the lowest blowing agent concentration with the lowest GWP could be used to calculate the emission reduction conservatively. Crediting this foam destruction should be considered as the most pragmatic and realistic solution for Mexico. Problems in accounting for the emission reductions can be resolved.

   During the Webinar 26 February, CAR indicated that more resources might become available for further improvements of the protocol. The most important potential improvement is the counterproductive demand that CFC must be destroyed from concentrated (liquid) form. In light of hundreds of millions CFC containing refrigerators worldwide and the investments needed to get CFC into liquid form, in the range of 2 – 4mio US$ per 100,000 refrigerators per annum capacity, it is certain that the majority of CFC worldwide (in Montreal Protocol language "banks") will end up in the atmosphere. Most of the hundreds of millions CFC containing refrigerators in the world are far from a recycling plant and this will remain so, even if there would be 100 more large scale recycling plants to be build.

   The only technology that can reach the majority of hundreds of millions of refrigerators with CFC is manual dismantling and collection of the foam. Foam can be collected, ground to powder under vacuum, or burnt as fuel. Therefore an effective Article 5 countries – oriented ODS protocol can include criteria to destroy manually separated foam and estimate the emission reduction credited with offsets. **(Thomas Grammig)**

   RESPONSE: The Reserve recognizes that the requirement that foams be extracted and destroyed in concentrated (liquid) form has potentially contributed to the relative lack of foam projects registered to date. The requirement was imposed because of large quantification uncertainties associated with other destruction methods. Please see the response to Comments #3. If and when the Reserve decides to expand the scope of the Mexico ODS protocol, we will explore additional technologies to destroy foams and review methodologies for determining the quantity and composition of ODS destroyed.

7. **Foam baseline (Section 5.1):** During the CAR Webinar 26 February, problems of establishing a baseline for blowing agent emissions were mentioned. The US ODS Protocol gives defaults in Table 5.4 for the ODS emissions during shredding and landfilling, all taken from Scheutz et al., 2007, p.7721 (Table 3) **[see reference in public comment submission]**, with a landfill reactor model estimating the degradation of ODS under anaerobic conditions. Scheutz et al. research at

Technical University of Denmark was funded by AHAM and aimed at investigating whether foam ODS emissions from landfills can be reduced by landfill operations themselves.

Scheutz et al. defined representative foam conditions and representative landfill conditions, as a basis for modeling the highest ODS degradation (model MOCLA-FOAM). It is not possible to establish to what extend these defaults in the US ODS Protocol are conservative but the two main elements of conservativeness are a) real landfills not being fully anaerobic, and b) foam in the landfill not being 5cm cubes without mechanical stress (stated p.7720, any deformation increases blowing agent release). Scheutz et al. (p.7721) further state "In normal landfill operation, waste is compacted to gain landfill volume. How the compaction is affecting initial and long-term release rates for blowing agents is not known". Compaction affects CFC-11 emission much less than HCFC-141b because CFC-11 decays much faster. The two main elements of conservativeness (a and b) are certainly larger than the influence of landfill waste composition or other physical parameters. Another aspect adding yet more conservativeness is that microbiological decay of CFC-11 under anaerobic conditions produces HFC-41 (besides HCFC-21, HCFC-31 and nonvolatile compounds), which does not decay and is thus emitted to the atmosphere. HFC-41 has a GWP of 141 **[see reference in public comment submission]** and this emission reduction is not accounted for.

Overall, if the Scheutz et al. results permit a conservative estimate for US landfills, there is no reason why these would not also apply in Mexico. The degree of compaction of a landfill only affects the level of conservativeness. The conservativeness remains if Scheutz et al. modeling chose the landfill parameters reflecting the lowest emissions situation (highest ODS microbiological decay). TEAP, 2005, Report of the Task Force on Foam End-of-Life Issues, refers to other research in Colombia and Germany confirming Scheutz et al. results. Considerable adaptation to Mexican conditions is also possible by running the MOCLA-FOAM model for landfill conditions and foam particle conditions representative for Mexico. This would reduce the level of conservativeness of the defaults for a foam baseline more in line with waste baselines in other cap-and-trade methodologies. **(Thomas Grammig)**

RESPONSE: Thank you for providing this additional feedback on establishing a baseline for foams. It will prove useful if/when the Reserve is able to move forward to expand the protocol to include foams - please see response to Comment #3.

2.4.1.1 Eligible ODS Sources

8. There's a considerable amount of ODS used for other applications such as medical and blowing agent that can be recovered and destroyed, so our suggestion is to include another applications and not only to the refrigerants. **(Quimobásicos)**

RESPONSE: The Reserve recognizes that there are a number of other sources of CFCs and other ODS that are not eligible under this protocol. Under the Montreal Protocol, there was an "essential use exemption" for the CFCs used in medical devices such as metered-dose inhalers (MDI) for treatment of asthma and chronic obstructive pulmonary disease, which allowed for a slower phase-out schedule for CFCs used for medical technologies. Due to this slower phase-out schedule, CFCs for medical uses were excluded from protocol eligibility in both the Reserve's US and Article 5 Project Protocols. Though CFC production for MDIs has now been phased out in all countries except China, and a number of countries, including Mexico, continue to have stockpiles of CFCs for MDIs, the Mexico ODS Project Protocol was meant to be an adaptation of the Reserve's other ODS protocols, and the budget and timeline did not allow for

an expansion of its scope. In the case of CFCs for MDIs, inclusion in the protocol would have required additional analysis to establish a baseline and performance standard. If the Reserve expands the protocol in the future, we will include consideration of these classes of ODS.

As for CFCs used as blowing agents in foams, please see the response to Comment #3.

5.1 Quantifying Baseline Emissions

9. For new refrigerants, the ineligible material has to be lower than 100ppm which is very low to determine the weight, also for recovered ODS the quantities are expected to be low. Can the protocol set a reference (somehow like the water content criteria) in those cases where the ineligible material is more than 1% has to be determined and deducted. **(Quimobásicos)**

RESPONSE: The requirement here is simply to deduct ineligible material in project calculations (no physical separation is required). ODS projects currently registered with the Reserve have not encountered issues measuring and deducting ODS amounts lower than 100 ppm.

5.2.1 Calculating Project Emissions from the Use of CFC Substitutes

10. The project emissions from replacement refrigerants is assumed at 13.5% (Equation 5.5) which is not realistic, given the dominance of three producers, their actual specifications are preferable and considerably lower. Perhaps it is a wise approach on policy grounds to request data from Mabe, Whirlpool and Samsung and use the highest one. All three produce some refrigerator models that have effectively no leakage at all, and they know what leakage their main production lines achieve. The proposed Protocol does not list NOM-015-ENER-2002 (in Appendix E), the Mexican legislation that requires manufacturers to certify their products. Including this law would also underline that refrigerator exchange programmes bringing in the majority of End-of-Life refrigerators to the CAyD comply with the energy efficiency classes in this legislation. **(Thomas Grammig)**

RESPONSE: Though the Reserve has not had the opportunity to analyze primary data from Mabe, Whirlpool and Samsung, the Reserve believes that retaining the assumed leak rate of 13.7% for substitute HFC-134a in Mexico is appropriate. That 13.7% leak rate, which is also used in the Reserve's Article 5 Project Protocol, is specific to HFC-134a leakage in Article 5 countries and comes from a 2006 Report by the UNEP TEAP Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee[2]. More recent reports by the RTOC[3] confirm that this continues to be reasonable, with leak rates varying dramatically in non-Article 5 countries (3.5% - 35% per year) and expected to be higher in Article 5 countries, such as Mexico. Further, the GIZ-Proklima Inventory itself estimates leak rates in Mexico ranging from 2% to 35% per year for HFC-410a, HFC-134a, and HCFC-22, with leak rates for most systems the 10% range. More specifically, domestic refrigeration in Mexico typically uses HFC-134a and does, as the

[2] United Nations Environment Programme, Technology and Economic Assessment Panel. (2006). Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. http://ozone.unep.org/Assessment_Panels/TEAP/Reports/RTOC/rtoc_assessment_report06.pdf

[3] United Nations Environment Programme, Technology and Economic Assessment Panel. (2010, 2014). Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. *http://ozone.unep.org/Assessment_Panels/TEAP/Reports/RTOC/RTOC-Assessment-report-2010.pdf* *http://ozone.unep.org/Assessment_Panels/TEAP/Reports/RTOC/RTOC-Assessment-Report-2014.pdf*

commenter suggests, have a lower leak rate of about 2%, but many industrial and commercial systems have significantly higher leak rates of 10-35%. For consistency with the Article 5 protocol and in an effort to be conservative (as substitute refrigerant leak rates impact project emissions), the Reserve has chosen to retain the 13.7% leak rate used in Equation 5.5.

As for the NOM-015-ENER-2002, this legislation establishes energy efficiency limits, test methods and labeling requirements for refrigerators, freezers and appliances. While this regulation has supported Mexico's Montreal Protocol phase-out goals and ongoing efforts to improve energy efficiency in refrigerators and other appliances, it is regulatory requirement outside the GHG project boundary and as such, not a regulation that verifiers or project developers need to review here.

11. A related issue for project emissions are the replacement refrigerants. The proposed Protocol states on p.22 that HCFC-22 and HFC-410a are common substitutes but this is a partial result from the GIZ-Proklima inventory. HCFC-22 and HFC-410a are not used for domestic refrigerators, only industrial systems. Therefore the replacement refrigerants for CFC-12 from CAyD are only HFC-134a and isobutane and the market share data available allows to calculate the GWP accordingly. **(Thomas Grammig)**

    RESPONSE: At the commenter's recommendation, the Reserve reexamined the GIZ-Proklima F-gas Inventory data on the market shares of substitute refrigerants currently being used in Mexico and expected sales distribution trends into the future (estimated for 2020-2030). As the commenter suggests, HCFC-22 and HFC-410a are indeed used as substitutes to CFC-12 primarily for commercial refrigeration and unitary air conditioning, but Mexico is beginning to phase out HCFC-22. HFC-134a is a substitute for mobile AC, domestic refrigeration, and some commercial refrigeration applications, and isobutene (HC-600a) is increasingly a substitute in domestic refrigeration. The Reserve did edit the protocol to make note of the fact that isobutene is also increasingly used as a substitute in Mexico. However, to avoid inconsistencies between the Mexico ODS protocol and the Article 5 Protocol (and the perverse incentives this might create), and in light of the ever growing market share of HFC-134a, the Reserve believes that the proposed quantification methodology, in which 100% of substitutes are assumed to be HFC-134a, is the most appropriate approach. Therefore, we did not make changes to Equation 5.5.

5.2.2 Calculating Default Project Emissions from ODS Destruction and Transportation

12. The proposed Protocol states that Quimobásicos is the only destruction facility currently authorized to destroy ODS and that a destruction trial was conducted by the National Ozone Unit at the Ecoltec cement kiln in 2008. A further potential adaptation to the Mexican context could be using the data from both in place of the Transport and Destruction default of 7.5 $kgCO_2e/kgODS$. **(Thomas Grammig)**

    RESPONSE: During protocol development, the Reserve did seek out Mexico-specific data to update the destruction emissions assumptions used for the default emissions factor, but no such data was forthcoming. As such, the Reserve has maintained the assumptions for destruction emissions based on destruction data from facilities in the United States. Though facility emissions in Mexico may be somewhat higher than in the US, as can be seen in Appendix D of the protocol, the overall default emission factor for transportation and destruction is expected to be more than sufficiently conservative to account for that. Further, it should be noted that emissions from transportation and destruction amount to less than 0.15 percent

baseline emissions, ultimately making a relatively minor impact on the total emission reductions achieved by the project.

13. This number is high compared with other projects, where the CO_2e per kilogram is 0.5, so we would like this number to be reviewed. **(Quimobásicos)**

RESPONSE: Though other methodologies (e.g., under the CDM) may account for emissions for transportation and destruction differently, the approach required here is consistent with the Reserve's other ODS Protocols. As noted above, a full explanation of how this emission factor was derived can be found in Appendix D of the protocol. Though the Reserve did update some of the assumptions used to derive the default emission factor, the Reserve ultimately decided to maintain the conservative 7.5 $kgCO_2e/kgODS$ used in the other ODS Protocols for consistency and conservativeness and in light of the fact that these emissions amount to less than 0.15 percent baseline emissions.

5.3 Deduction for Vapor Composition Risk

14. We don't think the densities have to be determined since the amount of ODS to be destroyed are determined by the weight (full and empty) and there are rules to certify the weight. **(Quimobásicos)**

RESPONSE: Though the total quantity of ODS destroyed (Qrefr), as well as the total mass of the contents in the project container, are determined by comparing the weight of the full and empty project container, this data is insufficient for assessing and managing the vapor composition risk. As explained in Section 5.3 of the protocol, in any given project container, the ODS may be in various liquid and gaseous (vapor) states due to differences in the thermodynamic properties of the different species of ODS. As such, the composition of ODS in the vapor could be vastly different than the composition of ODS in the liquid. When a sample (of liquid ODS) is taken per the requirements of Sections 6.4.2 and 6.4.3, it may lead to a very different composition analysis than what analysis of the vapor would have shown. As such, in cases where a project container includes more than one chemical, an additional deduction for the vapor composition risk must be taken, according to the methodology in Section 5.3, and testing the densities of the liquid and vapor phase components of the container is a necessary input to that established methodology, which is used in the Reserve's other ODS Protocols.

6.4.1 ODS Quantity Analysis

15. Please clarify the sentence "3 months prior or after a project destruction event." We consider that the calibration certificate has to be no more than three months prior to the destruction event (and not after). **(Quimobásicos)**

RESPONSE: In the public comment version of the Protocol, the Reserve provided additional flexibility in terms of making sure the scales were calibrated, due to the fact that Mexican law requires only annual calibration checks and due to stakeholder feedback that these scales typically need to be recalibrated somewhat infrequently. As such, the protocol allows for a scale to be demonstrated to be in calibration up to 3 months prior to, *or following,* a destruction event. Of course, if a destruction event takes place and the calibration test performed in the subsequent 3 months reveals that the scale was not in calibration, the material will have already been destroyed, which is a risk to the project developer.

16. Per operation logistics, we request no limitation in time for full and empty weight process. **(Quimobásicos)**

    RESPONSE: In an effort to maintain consistency and a level of rigor equivalent to that found in our other ODS Protocols, the Reserve prefers to maintain the requirement that full and empty ISO weights are taken within 2 days prior to and 2 days after project ODS destruction. However, the Reserve does recognize that this 2 day (48 hour) requirement could be problematic in circumstances where destruction finishes on a Friday evening, and no one will be able to weigh the empty tanks until the following Monday. In light of this, the Reserve has changed this requirement from 48 hours (2 days) to 72 hours (3 days) in the Mexico ODS Protocol.

6.4.2 ODS Composition and Concentration Analysis

17. We request that the laboratory should be accredited according to the applicable Mexican regulations (ISO17025 laboratory accreditation regulation). **(Quimobásicos)**

    RESPONSE: The Reserve has evaluated the ISO17025 laboratory accreditation against the AHRI-700 2006 standard, as well as discussed the AHRI accreditation process with an accredited laboratory that performs analysis on many US projects registered with the Reserve. However, the Reserve does not believe the ISO17025 laboratory accreditation, or any other laboratory accreditation we have reviewed, compares with the rigor of the AHRI-700 2006 certification. Certification by a refrigerant testing laboratory under the AHRI standard requires the laboratory to perform quarterly refrigerant analyses to this standard, demonstrated via pass/fail tests. Though an effort to develop a comparable ISO standard was in initiated, in an effort to increase the number of labs performing refrigerant analysis to this rigorous standard, that effort stalled and looks unlikely to resume. There are relatively few laboratories in the world that are accredited to this standard, yet the Reserve believes it is an important element of the protocol. Due to the importance of the laboratory analysis results in project emission reduction quantification, we believe reducing rigor in this area would present too high a risk. We have therefore retained the requirement that laboratories be accredited under AHRI-700 2006.

18. Does this [sampling requirement] refer to samples taken before ODS collection? Or any sample during the destruction process? If so QUIMOBASICOS request that the technician shows prof of proper training but not according to SEMARNAT course. **(Quimobásicos)**

    RESPONSE: The sampling requirement in Section 6.4.2 requires that samples of ODS be taken while ODS is in "the possession of the company that will destroy the ODS," i.e. the destruction facility. As the original phrasing could be somewhat ambiguous, the Reserve has clarified this further in the protocol. Section 6.4.3 establishes additional requirements for mixed-ODS projects, and clarifies that for mixed-ODS projects, samples may be taken at either the destruction facility or prior to the delivery at the destruction facility (such as the aggregation facility). In addition, the Reserve has reexamined the requirement that the technician taking the sample must have attended SEMARNAT's course and be listed on SISSAO. In the Reserve's other ODS Protocols, the technician must be "properly trained for the functions they perform," which is assessed by the verifier, but otherwise some degree of flexibility is allowed as to how that level of expertise is achieved. While the Reserve continues to believe that completion of the SEMARNAT course and listing on SISSAO may be one of the best ways to demonstrate a technician's competence, the Reserve also recognizes that requiring these credentials is more inflexible than the requirements of our other ODS Protocols, and as such, the Reserve has

revised this protocol to allow for professional judgement of the verifier when examining a technician's competence. That said, guidance has been included in the protocol that retains completion of the SEMARNAT course and SISSAO listing as an option that sufficiently demonstrates technician competence.