Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility

(Version 5)

STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: October 01, 2013 Screener: Christine Wellington-Moore

Panel member validation by: Hindrik Bouwman
Consultant(s):

I. PIF Information *(Copied from the PIF)*
FULL SIZE PROJECT GEF TRUST FUND
GEF PROJECT ID: 5492
PROJECT DURATION : 6
COUNTRIES : China
PROJECT TITLE: Contaminated Site Cleanup Project
GEF AGENCIES: World Bank
OTHER EXECUTING PARTNERS:
GEF FOCAL AREA: POPs

II. STAP Advisory Response *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies): **Minor revision required**

III. Further guidance from STAP

The objective as stated in the PID is "to support the Chinese government to establish the policy and regulatory framework for contaminated sites, and pilot the identification and remediation of sites contaminated with POPs and other hazardous chemicals. "

III. Further guidance from STAP

This PID format provides less detail than normal to permit a more rigorous review, though the STAP does not doubt the necessity of this project. Thus, given the situation in this country, and recognising the investment tied to this project, STAP would like to offer its assistance when further information becomes available. STAP will also raise issues in its comments that may have already been taken into consideration by project developers, but are hard to identify, or are partially alluded to in the PID format. The STAP acknowledges that some key steps are indeed flagged in the PID, but there are other lessons learned from the GEF portfolio that could be used to fine tune the approach in the PID.

STAP's comments:

a) The documentation lacks any preliminary risk assessment and a risk mitigation strategy as is typified in the PIF document, so it is difficult to ascertain risk for the project. Seeing as this was part of a larger loan package to the country, however, the STAP assumes that one was done, but suggests that it be elaborated in the final project document.

b) The document helpfully flags the intent of the project to draw on its past experiences in the field and in POPs legislative and institutional work. However no reference is made to examples from the GEF portfolio and work of other implementing agencies.

Given the rapid increase in remediation projects entering the work programme, the STAP has seen that there is a need to work with the GEF Secretariat to better amass knowledge and lessons learned around GEF technology demonstration projects. It is only just now beginning these efforts, but has already begun distilling some of the lessons from the literature, and the few recent comprehensive evaluations, such as the GEF/UNDP demonstration project "Environmental Remediation of Dioxin Contaminated Hotspots in Vietnam"; though the broader Agent Orange program with US support is relevant as well. The STAP also awaits lessons that might be gleaned from the World Bank's Belarus project "Persistent Organic Pollutant Stockpile Management and Technical/Institutional Capacity Upgrading". But with the evaluative material available, what is evident is that in spite of the fact that projects may target different chlorinated POPs products, there are many lessons that can be shared across remediation projects in general; and the STAP is sure that more lessons will be gleaned with more evaluations completed. It is encouraged that there be recognition of the successes and failures observed to date, with proper recording of operations of such projects to feed into the knowledge base. Admittedly, many key findings thus far actually apply to many thermal desorption processes; but lessons on non-combustion processes are fewer in the GEF portfolio (though the STAP does provide a link to external reports on the latter within this screen). Acknowledging that some of these are inferred in the PID, STAP proposed that the following points should be kept in mind as project development and implementation proceeds:-

1) Program Design regarding replication and upscaling

In this type of GEF project, the focus is on elucidating and demonstrating a technology that is appropriate for the intended scale of remediation required and under the conditions within the country. So one is not attempting to set up a definitive test of the technology's acceptability or otherwise, but rather assess potential for the technology to operate on a full scale basis, meeting national and internationally benchmarked remediation and environmental performance standards. Therefore, key outputs should include development of a proposed full scale commercial configuration based on data generated and lessons learned from the project. The remediation plan in its overall context for the site involved must include the scaling of the technology proposed, with some reasonable estimate of unit costs, and perhaps, consideration of handling of remediation output materials (see further details below).

Similarly if the technology is to continue to operate post-project, and/or be up-scaled it follows that there should be some capacity strengthening within the project, and if possible, a national training plan elaborated to support the commercial configuration and facilitate technology transfer. Also, given the expense of investing in any one technology, where possible (as this is not always the case), a criterion for technology selection might also include applicability to other chlorinated contaminant species.

There also needs to be recognition that any technology needs site-specific trials cost and performance analyses are to be reliable.

2) Define the problem well (site assessment and risk assessment) including addressing all contaminants (few sites are single contaminant problems) and doing baseline ambient environmental impact as well as monitoring during any site work

a) Detailed clarity on the characterization of contamination levels anticipated is critical. This would include recognition of co-contaminants that may affect technology performance, and recognition that there may be high variability. The characterization of remediation in situ, should recognize the non-uniformity of contamination. This carries over into technologies which are based on in-feed into a particular apparatus. More specifically, one should provide for:
i) a precise and clear definition of the targeted soils through the process of selecting source sites;
ii) acknowledging the possible necessity of increasing the extent of analytical characterization, to give an early and thorough indication of the wide range of contamination levels encountered for a given target location (especially in industrial sites where a mixture of chemicals have been dumped);
iii) appropriate planning of contracted analytical work to have this characterization available well in advance of starting remediation trials, and
iv) better knowledge of soil concentrations, such that there is common understanding of what might be encountered, and there can be better correlation made between pretreatment concentrations and remediation efficiency of the technology being assessed for commercial scale up.

b) Related to the aforementioned, direct analysis for key active ingredients and byproducts of the POPs involved (especially in the case of herbicides), as well as other priority pollutant constituents that may be present (eg chlorophenol, (heavy) metal species such as Mercury and Arsenic, Lead, Zinc,) should be identified ahead of remediation.

Though it may be potentially commercially and politically attractive, there is some evidence that it is detrimental to select separate technologies for sites based on predetermined contamination levels, which in and of themselves were not based on an adequate sampling and characterization regime. Thus a comprehensive, site-specific, advance characterization and site assessment should be prudently undertaken in advance of undertaking remediation activities, such that the whole range of contamination encountered, and its distribution at a relatively fine scale, is known. This also has implications for any attempt to apply absolute remediation standards to all results given the variation in concentration on sites, as well as (in the case of ex situ processes), between in-feed samples (in the latter case there might be pretreatment (eg through mixing of soils) to make for more uniform in-feed).

c) There should be good procedural definition of expectations and practices related to day to day technical communication and joint decision making on events and alterations during the program. Also, seemingly peripheral elements that could substantially affect the performance of the technology (eg. reliable power supply in the site area) should be thought through, and the appropriate stakeholder partners engaged in support of the work.

d) There should be some emphasis on workplace and general ambient monitoring so that emissions (eg VOCs and any noxious releases). There should be an ambient baseline set and monitoring during the remediation process; and capture of emissions and comprehensive environmental monitoring should be considered for any full scale commercial configuration.

3) The level of contamination and final handling of the treated soil should be carefully considered, including if there was unintended augmentation of active toxic by-products, heavy metals etc, as a result of the remediation action, or any other reduction in the quality of the soil. In some cases, for purposes of future land use planning, sites should be considered generally contaminated, and as such, may have inherent limitations respecting future land use including restriction to lower value and risk designations. In these cases, some form of land disposal that provides sufficient natural or engineered containment to avoid release to the general environment is required. However in some cases (particularly thermal and/or mechanical processes), the remediation process may result in treated material where soil structure is lost due to incineration of organic matter. The very fine grained structure generated therefore will require cover to avoid uncontrolled dispersal of windblown, potentially toxic, particulates. With this in mind, the handling of the treated matter should be considered in assessing any technology so that at the earliest, the client country is aware that additional investigation, investment, and perhaps broader national consultation and planning (eg with Land Use Planners), should be undertaken with respect to future management of treated material generally. This may include further investment into Research and development, such as consideration of stabilization perhaps within a building materials production process (eg cement on runways), use of soil additions to enhance fertility and restore soil structure (should toxicity levels meet appropriate standards), or what have you. But this can contribute to the overall cost of using a particular technology.

General advice

Remediation work should not commence unless there is clear characterization of contaminants, a "cradle to grave" assessment of employing a particular technology, and it is certain that there are sufficient financial and other resources to complete the job. There is a tendency for substantial underestimation of costs at the start of a remediation due to the uncertainty of the magnitude of contamination ahead of the commencement of remediation work. In the absence of such precautions, one can end up with a half finished job, with (re-)exposed pollutants, and exacerbated risks to environmental and human health. As such, some form of completion guarantee in the form of Government backstopping could be useful, as was done in the Belarus POPs burial site cleanup, where more POPs waste was found than estimated, but the government did the extra work to get it clean up and secured (see http://www.worldbank.org/en/news/feature/2013/01/28/belarus-neutralizing-dangerous-chemical-stockpile). In the absence of such, it may be wiser to simply present the definition of problem and commercial configuration plan, and not begin the remediation until better guarantee can be made that it can be carried out to completion.

Technology selection and evaluation should draw on the large body of existing work, such that there is not a tendency to "reinvent the wheel", whilst retaining the ability to improve on the knowledge base. There is some anecdotal evidence that in the POPs destruction area, there was an artificial creation of "POPs destruction technologies", when in the commercial world, POPs were but a subset of halogenated wastes that could be handled en masse. This artificial divide, however, meant there was a myopic approach to possible applications, and to recognition of shared experience that may have been mutually beneficial. Therefore as remediation projects become more frequent, it would be good to avoid the lack of coordination and sharing of lessons amongst similar GEF projects, and not tapping into global research and knowledge gained both inside and outside of the GEF, where it may exist (eg use of STAP products (its POPs Disposal Technology guidance defines what constitutes environmentally sound disposal of POPs, and technologies and costs to achieve it), Convention technical guidance and other training materials, etc). Remediation work should also try to draw on the extensive global experience on remediation and research that exists within key government agencies (eg EPA's assessment of non-combustion remediation technologies http://www.clu-in.org/download/remed/POPs_Report_FinalEPA_Sept2010.pdf).

Further, the capacity of national partners should be built as well, perhaps using elements from training guides such as the 2002 Basel Secretariat training manual "Destruction and Decontamination technologies for PCBs and other POPs Wastes under the Basel Convention: A Training Manual for Hazardous Waste Project Managers" (http://archive.basel.int/meetings/sbc/workdoc/TM-A.pdf). Though largely (but not exclusively) targeted to PCBs, and published a considerable time ago, it still has some utility in pointing out useful operational planning steps and stages that apply to any disposal or remediation project, and would amply inform the steps to be considered within any project. More research on lessons learned and planning/training materials would help ensure there are proper checks in place for the uncertainties for which remediation projects are prone.

STAP advisory response	*Brief explanation of advisory response and action proposed*
1. **Consent**	STAP acknowledges that on scientific or technical grounds the concept has merit. However, STAP may state its views on the concept emphasizing any issues where the project could be improved. Follow up: The GEF Agency is invited to approach STAP for advice during the development of the project prior to submission of the final document for CEO endorsement.
2. **Minor revision required.**	STAP has identified specific scientific or technical challenges, omissions or opportunities that should be addressed by the project proponents during project development. Follow up: One or more options are open to STAP and the GEF Agency: (i) GEF Agency should discuss the issues with STAP to clarify them and possible solutions. (ii) In its request for CEO endorsement, the GEF Agency will report on actions taken in response to STAP's recommended actions.
3. **Major revision required**	STAP has identified significant scientific or technical challenges or omissions in the PIF and recommends significant improvements to project design. Follow-up: (i) The Agency should request that the project undergo a STAP review prior to CEO endorsement, at a point in time when the particular scientific or technical issue is sufficiently developed to be reviewed, or as agreed between the Agency and STAP. (ii) In its request for CEO endorsement, the Agency will report on actions taken in response to STAP concerns.