

## Green Economy Initiatives Private Limited

CIN: U74900PB2013PTC038026

215 Silver City (Main) | Ambala Chandigarh Expressway (NH-22) | Zirakpur | District SAS Nagar (Mohali)  
140603 Punjab | INDIA[www.greenalliance.in](http://www.greenalliance.in)

### PT PROTOCOL- General Information

This PT protocol is a part of Information brochure on PT Scheme(s) and is in public domain ([www.greenalliance.in](http://www.greenalliance.in)). PT Protocol provides general information, on how PT Schemes are run, read along with PT Calendars and Registration Form ¶ Terms & Conditions for participation ¶ PT Protocol ¶ Frequently asked questions ¶ Accredited Scope as per ISO/IEC 17043. Participants are informed if there is any specific change in running a PT Round then described in the protocol.

For symbols, abbreviations/acronyms refer to end of protocol. In this protocol use of “masculine” gender shall include the “feminine” gender and “singular” shall include “plural” wherever relevant to the context, and vice versa.

#### PT PROVIDER LOCATION:

Green Economy Initiatives Private Limited  
215, Silver City (Main) | Zirakpur  
District Mohali (SAS Nagar) | Pin140604 | Punjab | INDIA

PT PROVIDER CONTACT DETAILS: [greenecomyipl@gmail.com](mailto:greenecomyipl@gmail.com) 88720761900

#### PURPOSE AND SCOPE OF PROFICIENCY TESTING:

GEI conducts quantitative and or qualitative or interpretive or sampling PT Schemes/PT Rounds; single or continuous; simultaneous; pre-analytical, analytical or post-analytical for evaluation of participant performance against pre-established criteria by means of interlaboratory comparisons in line with requirements of ISO/IEC 17043: 2023, ISO 13528:2022, customers, regulatory authorities and organizations providing recognitions (NABL). This PT Scheme is run to assess Correct application of sampling method(s) and plan to collect a representative sample including but not limited to gaps in competence and resources to do sampling and providing information required for the interpretation of results

#### PT PROVIDER USES TRADEMARK



#### EXTERNALLY PROVIDED PRODUCTS AND SERVICES

PT Provider does not use external service providers for the following activities (a) the design and planning of PT Schemes (b) the evaluation of performance (c) the authorization of reports. However, as and when required GEI may use Advisory Group / Technical Experts while conducting different PT Schemes. GEI purchases services and supplies including materials required for preparing the PT Items, consumables, reference materials, equipment's that affect the quality of its PT Schemes from authorized reputed / registered vendors only. GEI uses competent external service providers for testing carried out for the purpose of homogeneity or stability assessment or for assigning the property values (NABL 181A)

## IMPARTIALITY

### PT Provider ensures:

- PT Activities including performance evaluation of participants are conducted without any bias.
- Performance evaluation of participants and the validity of the PT Scheme are not compromised due to being influenced by any relationships.
- Arrangements are made to prevent collusion or falsification of results (**Refer Terms and conditions also**)
- When a relationship poses unacceptable threat to impartiality, PT services are not provided
- PT Items are prepared, handled and distributed by authorized person / agencies.
- The access to the records of communication, codification and distribution of PT Items are controlled.
- PT Provider has provisions to get photographs, videos, participants original observation data of test or measurement conducted on PT Item.

## CONFIDENTIALITY POLICY

- Identity of customer or participants is kept confidential by unique coding and is known only to persons involved in operation of PT Scheme. Participants may be given the same code number in different PT Scheme by chance. GEI has a continuing obligation to identify and report any actual or potential conflicts of interest arising during the operation of the PT Scheme. If an actual or potential organizational conflict of interest is identified, GEI will immediately make a full disclosure to the appropriate parties and actions to eliminate or minimize risks to confidentiality and to maintain confidentiality
- The information provided by customer or participants to PT Provider is kept confidential including any information created during PT Activities:
  - When PT Provider is required by law or authorized by contractual arrangements to release confidential information, the consent of participating laboratory is taken, unless prohibited by law except the records of PT Scheme participation are accessible to NABL. Results are also shared with regulators where asked by them. Results may also be shared with the customer for which a PT Scheme is provided through a contractual arrangement for its participants.
  - Participants can also be asked to waive of confidentiality within the PT Scheme for the purpose of discussion and mutual assistance or as required due to very nature of PT Scheme
  - PT Provider shares documents and records with organizations providing recognition e.g. NABL as part of its audit or assessment requirements.
  - PT Provider may use data and experience from operation of PT Schemes for the purpose of further developments including, but not be limited to, use for research publications or conferences, PT Conclaves, however, identity of participants is kept confidential
  - The identity of any external service Provider used is not disclosed in report or otherwise to ensure confidentiality
  - Information about a customer or participant from a source other than participant or customer is kept confidential by PT Provider. The identity of the source is kept confidential by PT Provider and is not shared with the customer or participant unless agreed by the source.

**PARTICIPATION IN A PT SCHEME:**

GEI tries it best to provide PT Schemes and incorporate parameters to deliver optimum solutions to CABs in terms of cost without compromising quality.

**For criteria to be met for participation, refer to Terms and Conditions.** For latest PT Calendars and Registration Form send an email to [greenecconomyipl@gmail.com](mailto:greenecconomyipl@gmail.com) or send a WhatsApp at +91-8872061900 providing following information (1) Organization Name (2) Email id (3) Groups or Sub-groups in which PT required as Water, Air, Food, Pharma, Minerals, Fertilizers etc.

Submission of registration form may be exempted by PT Provider at its sole discretion under any special circumstances as deemed fit by PT Provider and registration may be accepted via other means as request on email, work order etc. The decision of PT Provider is final in this regard. Registration is on first cum first basis. Participants who register late may be shifted to next PT Round. PT Provider may suggest/ request for participation in a specific scheme for meeting the minimum participants requirement or otherwise. PT Provider may also restrict participation depending upon the nature of the scheme and issues related to availability of infrastructure support or any other issues specific to the scheme.

Registration for a scheme closes on the date of registration mentioned in PT Calendars unless the scheme is extended. However, PT provider can admit participants who fail to register by the given deadline and may allow registration as long as sample preparation has not started or extra samples can be provided from the lot. The decision of PT provider is final in this regard.

Participation in PT scheme is given in good faith. PT Provider may refuse provision of PT Services to the customer or participant in case of influencing/ canvassing/ threatening/ disrespectful behaviour/ use of abusive language/ proven evidence of fraudulent behaviour/ suspected collusion or issues affecting impartiality, confidentiality and integrity / pending payments / harassment / business conflicts / nuisance / misuse and or theft of reports, data and information, plagiarism. PT provider may forfeit any payments made for PT purpose in such scenarios and decision of PT provider shall be final. Further, if it is found that any participant is misusing registration or making any other false claims to meet the requirements of accreditation or regulatory bodies and subsequently drop their registration or do not respond or does not make payments, the PTP has a right to bring the same to the notice of the concerned accreditation or regulatory body or customer and disclose the identity of such participant including taking any other appropriate action as deemed fit.

Where customer (e.g. a consultant) is coordinating PT for a group of laboratories; it is limited to making payments on behalf of laboratories or coordinating other administrative issues or request for a special Scheme say covering additional parameters, however, beyond that each laboratory has to register individually and any communication related to PT activities is done with laboratories only unless agreed otherwise.

Minimum number of participants for running a Quantitative/Qualitative PT Round are four or more. A Sampling PT Round can be run with two participants. For commercial reasons Schemes are preferably run when minimum 8 or more participants are available. For Quantitative/Qualitative PT Round if less than 4 participants are there the evaluation shall be done using assigned value determined by method other than using 'consensus value of participants'. Both accredited and non-accredited participants meeting requirements of NABL-142 are eligible for participation. If a laboratory is not meeting the requirements of NABL 142, it is labs responsibility to inform the PT Provider at the time of registration. PT Provider may allow participation to such participants, however, additional measures as laid down in PT Plan/Design are taken to ensure performance evaluation is meaningful.

In some PT Schemes as on food sampling, Participants may be Samplers (working in laboratories) in line with requirements of integrated assessments by NABL.

**FEES:**

Refer to PT Calendar.

Fixing/Charging of fees including providing any discounts is a sole prerogative of PT Provider.

**PROFICIENCY TEST ITEMS:**

PT Scheme Plan/Design discusses selection of the measurand(s) or characteristic(s) of interest, including information on what the participants are to identify, measure, or test or sample in the specific PT Scheme as well as description of the range of values or characteristics, or both, to be expected for the PT Items. Relevant information is available to participants initially in PT Calendars. Registered participants are provided all relevant information subsequently in detail during the operation of the PT Scheme.

The determinants in PT Items may either be at natural levels, incurred or spiked at a particular formulation level and or manipulated. The range of PT Items can usually be varied from round to round in order to be realistic and challenging.

Range is given only for limited guidance e.g. for an idea whether dilution will be required or not. It is varied to ensure that it is not used to guess the true value and sometimes may be used as a tool to avoid collusion or may not be provided. Laboratories should report the results as obtained by them irrespective of range given.

**HOMOGENEITY AND STABILITY OF PT ITEMS.**

**Quantitative and qualitative Schemes-**

For homogeneity ten replicates ( $n \geq 10$ ) at random are used for first PT Round and or during trials. It is done prior to distribution of the PT Items to the participants and after the PT Items are packed and unique ID numbers are given. The PT Items are ensured to be sufficiently stable for the duration of the program by doing stability checks every time over the duration of PT Round by selecting a minimum of six replicates and testing two replicates at the conclusion of the PT Round and compare these with one replicate tested prior to run. Where required during initial run of the Round or during trials or otherwise stability checks may additionally involve establishing suitable transport and storage conditions that may involve combination of simulated conditions, expert advice and assessment of historic data as applicable and documented in PT Design. Stability check may include comparing PT Items retained at the PT Provider's premises with PT Items subjected to shipping and return. Studies based on exposure to reasonably foreseeable conditions of transport may also be used. However, for parameters where PT Items used are sufficiently stable over the run period, the stability testing may also not be carried out as laid down in design taking expert advice.

The homogeneity and stability are ensured by establishing  $s_s \leq 0.3 \sigma_{pt}$  for homogeneity and Homogeneity Average (X)- Stability Average (Y)  $\leq 0.3 \sigma_{pt}$  for stability. This can also be subsequently revalidated using  $\sigma_{pt}$  derived from participants algorithm. The PT Provider may additionally use Cochran's C Test  $C_{max} < C_{critical}$  (implying no evidence of analytical outliers).

There may be cases where it is not feasible for PT Items to be subjected to homogeneity and stability testing e.g. Sampling Schemes (However, uniform case study is used for all participants) or there are Schemes where homogeneity testing cannot be carried out prior to distribution for practical, technical or logistical reasons. Such cases are documented in PT design and described in the report and testing may be carried out at the same time as by participants.

Further, in line with clause 6.1 of ISO 13528:2022 as documented in PT Design on case to case basis for subsequent Rounds, the number of PT Items included in homogeneity check may be reduced to  $g \geq 4$  or where a set of PT Items contain testing of multiple are used based on experience under repeatable conditions or on the basis of experience with the behaviour of closely similar PT Items in previous Rounds of the PT Scheme verified as necessary for the current Round. As experience is gained, critical measurands in a Round may be analyzed only instead of all irrespective of replicates used. Also as experience is gained with regard to behaviour of a PT item the testing for homogeneity may be carried out after packing and distribution of PT item to participants if so planned.

The aim is, however, to ensure that homogeneity and stability is fit for purpose and every participant receives comparable proficiency test Items.

In case of non-compliance, heterogeneity and or instability of the PT Items is considered for evaluating the performance of participants as per procedures. In these circumstances further explanation is given in the report and design is reviewed as applicable as certain PT Items may be heterogenous by nature.

#### **Sampling schemes-**

The homogeneity and stability is not applicable for sampling schemes as such. The sampling scheme involves assessment of correct application of sampling method(s) and plan to collect a representative sample for a given scenario (case study) including but not limited to gaps in competence and resources to do sampling and providing information required for the interpretation of results. The scenarios are chosen in line with Section-11 of ISO:13528 based upon requirements of regulators or customers through expert consensus. Standard sampling procedure or plan and predetermined criteria are used.

#### **PRODUCTION AND DISTRIBUTION OF PT ITEMS**

While organizing the different Rounds of the PT Schemes, GEI ensures that the matrix, properties, characteristics and concentration level of the PT Items are matching with the type of samples being regularly received by the testing laboratories. However, PT Items may be manipulated or be either at natural levels, incurred or spiked at a particular formulation level to ensure it is suitable for the purpose of evaluation.

In line with NABL-181A, PT Item supplied is sufficient for the analysis required once in order to ensure collusion does not happen. PT provider may issue additional PT item subject to its satisfaction of genuineness of the issue after due diligence. Decision of PT provider in this regard is final. The testing of PT Items is not for the purpose of providing 'statement of conformity' as such number of PT Items to be tested may not necessarily be in line with requirements laid down to meet product compliance specifications.

Participants are advised to treat the PT Items similar to their routinely tested samples and carry out the testing and reporting of the same in accordance with their normal procedure. However, participants may be instructed to report the test results in a different manner for the purpose of performance evaluation by PT Provider in some cases.

In sampling schemes no samples are sent. Participants are provided with 'case study' and participants have to do sampling and report information's as desired by PT Provider for evaluation of performance.

## REPORTING OF RESULTS

Participants shall use methods as told in instructions given for 'Handling and Analysis of PT Items'. Methods based on same or similar principle may also be used subject to be capable of achieving the measurement accuracy and/or measurement uncertainty required to provide a valid result. Please note PT Provider may, however, provide instructions to use specific amount of sample or condition a sample at particular temperature for a particular time to bring uniformity in handling on the basis of informed decision and as documented in PT Plan. If participant intends to use a method that is different from as given in instructions, participant should take prior permission in writing. PT provider may allow as per documentation in the PT Plan and provide relevant information including on performance evaluation to such participants.

Participant shall keep all technical or other records in line with requirements laid down in ISO/IEC 17025 for each activity related to participation in PT to facilitate audit trail (e.g. original data generated from analysis including any logged data, calculations, photographs, videos, status of calibration, use of reference materials etc.). PT Provider may or may not ask these records along with submission of PT Results. However, it is mandatory to provide such records in the stipulated time period whenever asked. The failure of participant to provide said records or any other relevant information when asked by PT Provider may lead to 'Results Not Considered' / 'Cancellation' of participation. Decision of PT Provider in this regard shall be final.

Results reported in a semi-quantitative manner as "less than" or "more than" a value, or results reported as zero except where it may be appropriate to report a result of zero together with qualitative results or results not reported in 'Result Submission Sheet' provided by PT Provider or by tampering 'Result Submission Sheet' provided by PT Provider or results reported in units different from asked by PT Provider or if any desired information in 'Result Reporting Sheet' is left blank shall be collated and listed in the PT round report as 'Results not Considered' and shall not be included in the statistical analysis including any results that are tagged i.e. any comments are given. Participant shall resolve such issues with PT provider before submission of results. The decision of PT Provider shall be final in this case and no communications shall be entertained in this regard after the announcement of results.

Summary of test results of participants as used by the PT provider are made available in draft result sheet, except for sampling schemes where these may or may not be provided, prior to release of final report. Draft result sheet is submitted only to verify that data read and entered by PT provider is correct and there are no readings or typing errors on PT provider's part. The data values are, however, rounded to the decimal points as per standard practice laid down by IS e.g. if reporting decimal point (DP) asked is 2 and CAB report results as 23.445, then it is recorded 23.45 and if CAB reports as 23.444 then it is recorded as 23.44. No requests for any change in results are accepted except if there are typing and reading errors at PT providers end. Participants are asked to crosscheck and confirm in two days from the date of sending email and no claims are entertained later. PT provider does not provide draft result sheet or final report to participants who have not cleared the payment. In such a case, PT provider is not responsible if subsequently it is found that any results provided by participants are entered wrong due to lack of cross checking or otherwise.

The data values are however rounded to the decimal points as per standard practice laid down by IS e.g. if reporting decimal point (DP) asked is 2 and CAB report results as 23.445, then it is recorded 23.45 and if CAB reports as 23.444 then it is recorded as 23.44

For PT schemes as on sampling instead of 'Result submission sheet' information may be asked in other formats as relevant to the PT scheme. In addition, participants are also asked to submit certain information in formats used by participating laboratories. Photographs and videos may also be asked.

For some parameters there may be large variation in test methods followed by CABs due to non-availability of standard methods or otherwise; in such scenario's PT provider may provide specific instructions for the purpose of uniformity.

**TIMELINE:** Refer to terms and conditions of participation

#### **PREVENTION OF COLLUSION AND FALSIFICATION:**

PT Provider builds a lot of measures in PT Round to try to prevent collusion. This may include but not limited to - The amount of PT item sent to participants is not too large; Manipulating 'range' for the purpose; Use of blind samples etc. Raw data, photographs and videos may also be asked. Participants are strongly advised not to engage in any collusion. Collusion is sole responsibility and risk of participant

#### **STATISTICAL ANALYSIS OF DATA**

The statistical analysis of data set is done starting with identification and removal of blunders by visual review as well as subjecting the data to any one of the following methods individually or in combination (i) Results that deviate from the  $\bar{X}$  by more than  $\pm 5\sigma_{pt}$  or (ii) Outlier detection test such as Grubbs test (iii) presence of any obvious blunders or erroneous reporting in case of qualitative schemes based on literature, experience and any other relevant factors as laid out in PT Plan/Design. When any participant result is excluded then it is excluded only for the purpose of determination of  $x_{pt}$  and  $\sigma_{pt}$  or other evaluation criteria.

#### **Quantitative Schemes-**

After removal of blunders, PT Provider further uses robust estimators such as Algorithm-A in line with ISO 13528:2022 for the determination of both assigned value as well as  $\sigma_{pt}$  from the consensus value of participants when  $p \geq 12$  (after removal of outliers) as specified in Note 2 under D.1.2 of Annex D of ISO 13528:2022. When  $p < 12$  (after removal of outliers) PT Provider uses other techniques as provided in ISO 13528:2022 and laid down in its procedure as median of the participants' results or robust average from modified Algorithm-A. When z-score or z-prime score is determined as specified above, PT Provider ensures that participants identified as blunders are getting z-score or z-primes score  $\geq \pm 3$ .

#### **Qualitative Schemes-**

Where assigned value is reported on a categorical (or nominal) scale, the assigned value determined by any of the methods should match exactly with the results obtained from homogeneity assessment. Where assigned value is reported on an ordinal scale, the assigned value determined by any of the methods should not differ by more than the permissible limit (that is used for performance evaluation of participants) with the results obtained from homogeneity assessment as provided in PT Plan/Design.

#### **Sampling schemes-**

Sampling scheme uses expert consensus in line with Section-11 of ISO:13528 to decide a case study in line with regulatory or customer requirements and then uses predetermined criteria from sampling methods by expert consensus to determine correct application of a sampling method and plan by participants and their evaluation. Three experts are used for analysis of data.

## ASSIGNED VALUE, METROLOGICAL TRACEABILITY AND MEASUREMENT UNCERTAINTY OF ASSIGNED VALUE

### Quantitative Schemes-

The assigned value  $x_{pt}$  is the value selected as being the best estimate of the 'true value' for the parameter under test. A consensus value of participants is taken by PT Provider as assigned value unless explained otherwise in design. The standard uncertainty of assigned value  $u(x_{pt})$  is calculated using the following formula:

$$u(x_{pt}) = 1.25 \times \frac{s^*}{\sqrt{p}}$$

The  $u(x_{pt})$  is compared with the following criteria to ensure compliance:  $u(x_{pt}) \leq 0.3 \sigma_{pt}$ . In case of non-compliance with the above criteria, performance evaluation is not done using z-score but using z'-score (z-prime) by taking into consideration the standard uncertainty of the assigned value also in the denominator.

The validity of the assigned value for measurands or characteristics of interest determined in PT Items is done by determining the estimate of the reference value of the PT Items determined independent of the participants results,  $x_{ref}$  (for example homogeneity average of the concerned measurand determined by an accredited CAB which is not a participant i.e. CAB that has done homogeneity or stability testing). The difference between homogeneity average and consensus average of participants is then calculated. The difference should be less than 2 times  $u_{diff}$  where  $u_{diff} = \sqrt{[u(x_{pt})^2 + u(x_{ref})^2]}$

PT Round may be planned and run adopting other methods for determination of assigned values as (i) by formulation (also called as Known Value Scheme) or (ii) by using a CRM as PT item or (iii) Using a single laboratory using a reference method or (iv) by using consensus value from expert CABs.

The assigned value is traceable to SI units in line with requirements of ISO/IEC 17025 read along NABL-142 through traceable calibrations and reference materials.

### Qualitative Schemes-

When the test results reported on categorical (nominal) scale, mode (most common observation) reported by participants is used as the assigned value or when the test results reported on ordinal scale (i) either mode (most common observation) or (ii) median reported by participants is used as the assigned value.

### Sampling Schemes

Predetermined criteria from sampling methods by expert consensus is considered as assigned value in line with Section-11 of ISO:13528



**STANDARD DEVIATION FOR PROFICIENCY ASSESSMENT ( $\Sigma_{PT}$ )**

**Quantitative Schemes-**

Initially expected or target  $\sigma_{pt}$  can be chosen by perception (literature, expert opinion and or experience for previous programs) or predicted from model by Thompson based on Horwitz equation.

Subsequently, the robust standard deviation of the participants results is treated as  $\sigma_{pt}$  and it is determined by using Algorithm A as given in ISO 13528:2022 where  $p \geq 12$  of if  $p < 12$  PT Provider uses other techniques as provided in ISO 13528:2022 and laid down in its procedure as median of the participants' results or robust average from modified Algorithm-A.

In line with NABL 181A and ISO 13528:2022 clause 8.6.2 in order to ensure that the  $\sigma_{pt}$  used for performance evaluations is fit for purpose PT Provider uses initial  $\sigma_{pt}$  from perception (literature, expert opinion and or from experience) as applicable as detailed out in its procedures, PT plan and highlighted in summary and performance characteristics including ensuring fitness with reference to lower and upper limits.

$\sigma_{pt}$  is not applicable in case of **qualitative Schemes**.  $\sigma_{pt}$  is also not applicable in **sampling schemes as such**. Standard sampling procedure or plan and predetermined criteria are used.

**PERFORMANCE EVALUATION**

**Quantitative Schemes-**

Performance evaluation is conducted in terms of z-score which is calculated using the following formula:

$$z\text{-score} = \frac{(x_i - x_{pt})}{\sigma_{pt}}$$

It is possible for the z-scores published in this report to differ slightly from the z-score that can be calculated using the formula given above. These differences arise from the necessary rounding of the data prior to its publication in report.

When  $u(x_{pt})$  is not meeting the criteria:  $u(x_{pt}) \leq 0.3 \sigma_{pt}$ . performance evaluation is done using z'-score (z-prime) by taking into consideration the standard uncertainty of the assigned value also in the denominator:

$$z'\text{-score} = \frac{(x_i - x_{pt})}{\sqrt{[(\sigma_{pt})^2 + u(x_{pt})^2]}}$$

If  $p < 12$  PT Provider uses other techniques as provided in ISO 13528 and laid down in its procedure.

The following interpretation is given to results

Result	Interpretation	Coding
$ z/z'-score  \leq 2.0$	Satisfactory result	Black
$2.01 <  z/z'-score  < 2.99$	Questionable result (straggler)	<b>Black</b>
$ z/z'-score  \geq 3.0$	Unsatisfactory result	<b>Red</b>
--	No score RNS or RNC as explained	Black
Blunder	Obvious odd values as explained	<b>B (Score) Red</b>

Where  $|z|$  denotes the absolute value of the z-score. When an outlier is identified the sign of the z-score indicates whether the result is too high (positive z-score) or too low (negative z-score).

### Qualitative Schemes

The method used for performance evaluation is as under in line with section-11 of ISO 13528: 2022

When the test results reported on **categorical (nominal) scale**, each participant CAB which has reported the result should be marked as **satisfactory (or scored as a success)** if it exactly matches the assigned value. Otherwise, the participant CAB should be marked as **unsatisfactory** or given an **adverse performance score**.

When the test results reported on **ordinal scale**, each participant CAB which has reported the result should be marked as **satisfactory (or scored as a success)** if the difference between the result and assigned value do not deviate by more than half a grade. Otherwise, the participant CAB should be marked as **unsatisfactory** or given an **adverse performance score**.

In both the cases specified above, the PT Report should clearly indicate the proportion or number of participants who have reported the assigned value correctly or with in permissible limits. In circumstances where number of participants whose results are not in agreement with assigned value are more than 75%, further explanation shall be given in the report.

### Sampling schemes





The evaluation is done using “**Overall Performance Index (OPI) Model**” which makes uses of predetermined criteria agreed by expert consensus. The obvious strength of this approach is that it involves consideration of all key steps as identified in predetermined criteria in sampling method and plan to determine its correct application. Operational performance of individual steps is determined on the basis of assigned score by expert consensus w.r.t clause 11.4.3 of ISO 13528 as:

Assigned Performance Score (PS) by Expert Consensus	Remarks
3	Acceptable (Full compliant)
2	Followed to large extent
1	Followed to some extent
0	Unacceptable (Non-compliant)

The performance scores in individual steps are converted to Overall Performance Index (OPI) to reflect the overall performance of the CAB:

OPI = [Total PS obtained by participant ÷ (n x ACV)X Absolute Complaint Value for PS]

**OPI Interpretation:**

OPI ≤ 0.75	Unsatisfactory (outlier)	
0.76 < OPI ≤ 1.50	Questionable (straggler)	
1.51 < OPI ≤ 2.25	Satisfactory	
2.26 < OPI ≤ 3.00	Good	

OPI	Level of action envisaged	Remarks
Unsatisfactory (Outlier)	Shall review competence requirements and re-establish competence to do sampling including a review of training, supervision and authorization of personnel.	Irrespective of OPI, wherever against a pre-determined criteria performance score is 0 or 1 or RNC root cause analysis and corrective action is suggested, based on risk levels established by the laboratory.
Questionable (Straggler)	Shall do training of personnel on all aspects of sampling and review supervision	
Satisfactory	See remarks	
Good	See remarks	

No score is given for RNS or RNC. Results are not taken as RNS where Participant may not submit results for a parameter(s) for various reasons- It is not in their scope or they have already covered that parameter(s) or participating only for outlier parameters or as per their plan will participate in parameter(s) in next Round or during testing is not confident of the results etc. PT Provider in this case does not give score and mark the column as '--'. Results not considered are situations where participants report results as zero (except where results can be zero) or non-numerical results e.g. <0.1 or >1, Nil, BDL etc. or results are qualified by any symbol or given with any remarks etc.; these results are not considered for performance evaluation – PT Provider in this case do not give score and mark the column as '--'.

**FEEDBACK, APPEAL AND COMPLAINT**

All due diligence is exercised in conducting the PT Round yet if a participant has any concern about any aspect of PT Round, they should contact undersigned within 15 days from the date of release of final report:

Quality Manager  
 Green Economy Initiatives Private Limited  
 greeneconomyipl@gmail.com  
 M: 8872061900

Participants are encouraged to provide feedback for improving any aspect of the PT Scheme/ Round. Feedback form is sent along with the final report. Appeal, a request can be made by a participant for reconsideration of any adverse evaluation. If a complaint is received, an investigation is conducted in accordance with procedure laid down by GEI and the participant is conveyed of the outcome.

**USE OF PT REPORTS:**

The report or any other documents and records of PT Provider are strictly for use by customer or participant for (i) Participation in PT with PT Provider (ii) To monitor performance and or to improve the participants performance (ii) To show to relevant regulators and or organizations providing recognition as part of audit / assessment requirements. PT Report or any document or records in part or whole shall not be shared and or used by customer or participant to any individual or organization including its other divisions/sections for any reason other than as stated above without taking the permission of MD of PT Provider in writing. PT Provider can bar future participation for customer or participant if misuse or unauthorized sharing or use or tempering or copy paste of any records or documents of PT Provider is found. The customer may be provided with PT Report as applicable and agreed for a particular purpose.

**DISCLAIMER**

PT Activities are undertaken by PT Provider in good faith and in accordance with best industry practice. Neither Green Economy Initiatives Private Limited (PT Provider) nor any individual or any other organization involved accepts any liability whatsoever from application or use of information contained therein or from any inadvertent error in the information in report including without limitation indirect or consequential loss or damage. This statement does not affect your statutory rights.

Comments or recommendations in PT Report does not construe to be any legal or technical advice to participant. PT Provider is also not soliciting any action based on it. Any trade name given in this report is information given for the convenience of users and does not constitute as endorsement.

The customers and participants agree that any matters are governed by Indian law. All disputes are subject to original jurisdiction of Courts in district SAS Nagar (Mohali) Punjab, India

**IMPORTANT**

Participants are requested to go through all related documents in information brochure as PT calendar, registration form, terms and conditions for participation, NABL and clarify if there are any doubts any time including If there is any contradiction in details given in different documents under information brochure. All clarifications must be taken in writing on email, conclusions drawn from telephonic discussions are at participants own risk. Typographical and clerical errors are subject to correction.

## SYMBOLS

<b>g</b>	Number of PT Items tested in homogeneity checks
<b>m</b>	Number of replicate measurements to be made on a PT Item
<b>p</b>	Number of participants taking part in round of PT Scheme
$s_r$	Estimate of repeatability standard deviation
$s_R$	Estimate of reproducibility standard deviation
$s_s$	Estimate of between sample standard deviation
$s^*$	Robust estimate of the participants standard deviation
$s_{\bar{x}}$	Within-sample or within-participant/laboratory standard deviation
$s_w$	Standard deviation of sample averages
$\sigma_{pt}$	Standard deviation for proficiency assessment (SDPA)
$\sigma_r$	Repeatability standard deviation
$\sigma_R$	Reproducibility standard deviation
$u_{char}$	standard uncertainty due to characterization,
$u_{hom}$	Standard Uncertainty due to difference between PT Items (Inhomogeneity)
$u_{stab}$	Standard Uncertainty due to instability during the period of PT
$u_{trans}$	Standard Uncertainty due to instability during transport conditions
$u_{max}$	Upper limit of standard uncertainty used for screening participants reported MU
$u_{min}$	Lower limit of standard uncertainty used for screening participants reported MU
$u(x_i)$	Standard Uncertainty of a result from participant $i$
$u(x_{pt})$	Standard Uncertainty of the assigned value
$u(x_{ref})$	Expanded Uncertainty of a reference value
$U(x_i)$	Expanded Uncertainty of a result from participant $i$
$U(x_{pt})$	Expanded Uncertainty of the assigned value
$U(x_{ref})$	Standard Uncertainty of a reference value
$w_t$	Between test portion range
$w^*$	Robust estimate of participant repeatability
$x$	Measurement Result (generic)
$x_{char}$	Property value obtained from characterization (determination of assigned value)
$x_{CRM}$	Certified value for a property in a CRM
$x_{diff}$	Difference between an independent reference value or a robust average and an assigned value
$x_i$	Measurement result from participant $i$
$x_{pt}$	Assigned value
$x_{ref}$	Reference value for a stated purpose
$x^*$	Robust estimate of the participant mean
$\bar{x}$	Arithmetic average of a set of results
<b>Z</b>	Score used for proficiency assessment (absolute value $\pm$ )
<b>Z'</b>	Modified z-score (commonly pronounced as z-prime)
$\delta_{hom}$	Errors due to difference between PT Items
$\delta_{stab}$	Errors due to instability during the period of PT Items
$\delta_{trans}$	Errors due to instability during under transport conditions
<b>X</b>	Homogeneity Average
<b>Y</b>	Stability Average
<b>B</b>	Blunder

**ABBREVIATIONS / ACRONYMS**

ACV	Absolute compliant value
Amd.	Amendment
BDL	Below Detection Limit
CRM	Certified Reference Material
CAB	Conformity Assessment Bodies
DP	Decimal point. This indicates the number of decimal places to which participants should report their measurement results.
e.g.	For example
et al.	Latin phrase et alia, which means "and others"
etc.	et cetra; and so on, and other thong of a similar kind
ESP	Externally Provided Products and Service Providers / External Service Providers
GEI	Green Economy Initiatives Private Limited / PT Provider
HDPE	High-density polyethylene
ISO	International Organization for Standardization
IEC	International Electro Technical Committee
MD	Managing Director
NABL	National Accreditation Board for Testing and Calibration Laboratories
OPI	Overall Performance Index
PDF	Portable document format, used to display documents in an electronic form independent of the software, hardware or operating system they are viewed on.
PS	Performance score
PT	Proficiency Testing
RNS	Results not submitted
RNC	Results not considered
SI	International System of Units
w.r.t.	acronym for with respect to

Any other symbol or abbreviation used is described at the first instance. For more details including terms and definitions refer to ISO/IEC 17043:2023, ISO 13528:2022, ISO/IEC 17025:2017 and ISO/IEC 17011:2017.