SCIENCE BASED TARGETS NETWORK

FRESHWATER

Freshwater Step 3 Technical Guidance Version 2

STEP 3

MEASURE, SET & DISCLOSE

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Credits

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    - Step 1: Assess
    - Step 2: Interpret & Prioritize
    - Step 3: Measure, Set, & Disclose
    - Step 4: Act

Companies are expected to use the methods in succession (i.e., use Step 1, then Step 2, then Step 3, then Step 4). However, understanding the content of future steps may improve the efficiency of prior steps.

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How to use this guidance

What this document does

This guidance sets out how to convert the basins and pressures you prioritized in Steps 1 and 2 into validated freshwater science-based targets. It covers three targets: Freshwater Quantity, Nutrient Freshwater Quality, and Pesticide Freshwater Quality.

It does not tell you which basins to act in. That was decided in Step 2: Interpret & Prioritize. It does not tell you what actions to take. That is guided by Step 4: Act.

Before you start

By the end of Steps 1 and 2, companies will have:

- Screened their economic activities for materiality;
- Completed an initial place-based assessment of pressures and states;
- Defined the spatial scale for each pressure using the relevant SBTN methodology for target setting; and
- Prioritized locations to set science-based targets on Freshwater Quantity and Freshwater Quality.

Rankings may differ between pressures. A basin can be top priority for water quality but not for quantity, and you will need to keep separate rankings for validation.

Minimum data requirements are set out in the section of that name. If you cannot meet them for a basin, you cannot set a target there yet.

How the guidance is organized

Target setting runs through seven tasks, spread across four sub-steps (Figure 1):

Sub-step	Task	What you do	Section of this guidance
3a. Approach selection	1	Check the Target Tracker and Basin Threshold Tool (BTT)	3.1.2
	2	Consult stakeholders on local resources and the global model	3.1.2
	3	Document your approach selection	3.1.2–3.1.3
3b. Baseline setting	4	Compile your activities in the basin	3.2.1
	5	Calculate your baseline	3.2.2–3.2.5
3c. Required basin-wide reduction	6	Calculate the required basin-wide reduction	3.3.1, 3.4.1, 3.5.1

3d. Company targets	7	Set your company targets	3.3.2–3.3.4, 3.4.2–3.4.4, 3.5

Tasks 1 to 5 are the same for all three pressures. Tasks 6 and 7 differ, so each pressure has its own section.

To see at a glance which approach applies in each basin, start with the decision tree in Figure 4 (Section 3.1).

Which sections apply to you

Most companies do not need the whole document. Use this table to find your path.

If you …	Read Sections
Have water quantity pressures only	1.1–1.3, Minimum data, 3.1, 3.2.1–3.2.3, 3.3, 3.6
Have nutrient pressures only	1.1–1.3, Minimum data, 3.1, 3.2.1–3.2.2, 3.2.4, 3.4, 3.6
Use pesticides, with traceability to the producer or the first or second point of aggregation	1.1–1.4, Minimum data, 3.1, 3.2.1–3.2.2, 3.2.5, 3.5, 3.6
Use pesticides	Table 2: Pesticide targets by company role and traceability in Section 1.4 Applicability of pesticide targets

If several pressures are material in the same basin, read each relevant pressure section. Where both nutrient and pesticide pressures are material, you should set targets for both.

Additional resources

You can find these in the Resources library on SBTN's website.

Resources to accompany Step 3: Freshwater

- Step 1 Toolbox
- State of Nature Water Layers app
- Basin Threshold Tool
- Hogeboom's global water quantity app (Water Footprint Network platform)
- Pesticide Impact Quantification (PIQ) Tool and Manual
- Claims Guidance V2 [In prep]
- Crosswalking SBTN Freshwater Requirements with CSRD Water Disclosures (2026)
- Corporate water stewardship and science-based targets for freshwater: Alignment and interoperability between leading approaches (2024)
- Validation Data Template—Step 3 Freshwater V2 [In prep]
- Validation Submission Form—Step 3 Freshwater V2 [In prep]

Subsequent methods

- Step 1: Assess V2
- Step 2: Interpret & Prioritize V2
- Step 3: Measure, Set, & Disclose—Land V2
- Step 3: Measure, Set, & Disclose—Ocean V1
- Step 4: Act V1

General resources

- SBTN Freshwater- Technical FAQs

Please note the following conventions used in this document

- Orange text signifies a linked webpage.
- Numbers in superscript, for example, [1], indicate links to footnotes.
- Requirements and recommendations are formatted as follows:

Req. 1

> Requirement 1

Rec. 1

> Recommendation 1

Introduction

Step 3: Freshwater targets

Science-based targets are defined as measurable, actionable, and time-bound objectives, based on the best available science and best practices, which allow actors to align activities with Earth's limits and societal sustainability goals.

For freshwater, this definition refers to what the latest ecohydrological science identifies as necessary to ensure pressures remain within local thresholds that support the attainment of the desired state of nature.

SBTN's Step 3 Freshwater Technical Guidance includes methods to set science-based targets for three types of freshwater pressure:

- **Freshwater Quantity**: surface water and groundwater withdrawals;
- **Nutrient Freshwater Quality**: nitrogen and phosphorus loading;
- **Pesticide Freshwater Quality**: the potential freshwater ecotoxicity impact of pesticide use.

Freshwater Quantity and Nutrient Freshwater Quality targets are basin-specific pressure reduction targets for withdrawals and nutrient loading. Pesticide Freshwater Quality targets combine a Pesticide Impact Reduction target with two complementary targets: a Highly Hazardous Pesticides (HHPs) Cessation target and a Pesticide Landscape Engagement target.

1.1 General approach

The approach to setting science-based targets for nature is grounded in the Drivers, Pressures, States, Impacts, Responses (DPSIR) framework (please refer to the Step 1 Technical Guidance for additional information), which provides a structured understanding of how anthropogenic pressures, including company-driven activities, influence the state of nature. It also defines thresholds that delineate the boundary at which those pressures *may* trigger a shift away from the desired ecological condition. For example, freshwater pollution is a pressure that can downgrade freshwater quality.

There is a five-step process to set science-based targets for nature:

- *Step 1: Assess*—screen activities for materiality, map value chain locations and assess environmental impacts;
- *Step 2: Interpret & Prioritize*—identify priority locations for science-based target setting and set enabling targets for locations with limited traceability;
- *Step 3: Measure, Set, & Disclose*— determine baselines and set and validate realm-specific targets based on regionally appropriate ambition levels;
- *Step 4: Act*—develop action strategies to make progress on the targets while accounting for biodiversity and social safeguards;
- *Step 5: Track*—measure, report, and verify progress on the targets (MRV).

Companies *may* choose which pressures and basins within their Step 2 target boundary to set Freshwater science-based targets for. Targets *must* follow the requirements of this

guidance, and companies *must* disclose the coverage of their targets relative to their material pressures (Section 1.3). Step 1: Assess and Step 2: Interpret & Prioritize determine which sites and activities are in scope.

Where a company's water use, nutrient load, or pesticide use and potential ecotoxicity impact make Freshwater targets material in a basin, the company *must* use this Step 3 Freshwater V2 guidance. Data from the Step 1b value chain assessment *may* be used to calculate a baseline only where it is consistent with this guidance.

The methods follow a basin-first approach, with some exceptions for pesticide targets. Companies first determine the maximum allowable pressure in the basin that is consistent with the desired state of nature (e.g., environmental flows, nutrient concentrations, or "safe" benchmarks for pesticide impact). The resulting basin-wide reduction is then applied to the company's own baseline pressure in that basin. This anchors company targets in what the basin as a whole can sustainably support, rather than in company pressures in isolation.

To do this, companies apply an approach (Step 3a) that *may* combine models, monitoring results, local assessments, thresholds, government-established environmental objectives, or chemical footprint tools. For pollution, for example, a target defines the maximum amount of a pollutant a company can discharge in each basin while keeping freshwater quality acceptable for species and ecosystems.

Pesticide targets differ from Freshwater Quantity and Nutrient Freshwater Quality targets. Pesticide Freshwater Quality targets consist of:

- Pesticide Impact Reduction (with focus on ecotoxicity impacts on freshwater ecosystems);
- Highly Hazardous Pesticides (HHPs) Cessation (also integrating human health considerations);
- Pesticide Landscape Engagement targets.

The Pesticide Impact Reduction target most closely follows the Nutrient Freshwater Quality approach (see Box 2). Target setting also differs for companies that produce or trade pesticides and for companies that use pesticides in their value chain, for example through sourcing food and fiber crops. Section 1.4 sets out which pesticide targets apply and which steps to follow.

Step 3 targets, apart from HHPs Cessation and Pesticide Landscape Engagement targets, are expressed as reductions in withdrawals or pollution. Step 4 response options include both direct and indirect actions in the basin.

Setting reduction targets for Freshwater requires three components:

1. *Indicators to represent pressure and the state of nature*

Indicators to measure both pressure exerted on the environment and the resulting state of nature. Following the example above for pollution, these indicators could be:

- Pressure indicator: the rate at which phosphorus (P) is loaded into a water body;
- State indicator: the P concentration in that water body.

2. *A threshold value defining the environmental limit*

A threshold representing the maximum level an environmental indicator can reach without compromising the desired state of nature. Continuing with the above example:

- The threshold corresponds to the maximum P concentration that still supports a healthy aquatic ecosystem

3. *A method to link pressure to the desired state of nature*

A method is required to determine how changes in pressures affect the state of nature. Completing the above example:

- A model, method, or tool can be used to estimate the maximum P load (pressure) that will keep concentrations below the defined threshold.

This guidance sets targets that reduce pressures to limits aligned with environmental thresholds, protecting and promoting the desired state of nature. It does not consider the business risk these pressures pose to the company. The validation requirements set the minimum criteria and ambition levels: companies wishing to validate their targets *must* submit the documentation they specify, and are encouraged to set more ambitious targets where possible. Step 3: Measure, Set, & Disclose has four sub-steps (Figure 1), which apply to all three target types.

Because targets are derived this way, a company's target is its contribution to a basin-level outcome rather than a measure of that outcome. A company may meet its target in full while the basin remains outside its thresholds, since recovery depends on reductions by all users. Companies are therefore encouraged to track basin conditions alongside their own progress, and to pursue collective action where their own reductions are not sufficient (see Section 3.6 and Step 4: Act).

The four sub-steps of the Freshwater target-setting process are as follows:

- Step 3a: The company checks the SBTN Basin Threshold Tool and consults relevant stakeholders to identify basin-specific data and methods, then selects the approach for each basin and pressure.
- Step 3b: The company aggregates its pressures (water withdrawals or consumption, nutrient load, or pesticide use) across all its activities in the basin over the baseline period and records the baseline values. For pesticides, use is translated into potential ecotoxicity impact, and HHPs are identified.
- Step 3c: The company applies the selected approach to calculate the required basin-wide pressure reduction.
- Step 3d: The company sets company-specific targets for the basin (or for the landscape, company, or business unit for some pesticide targets) and submits them to SBTN for validation and disclosure.

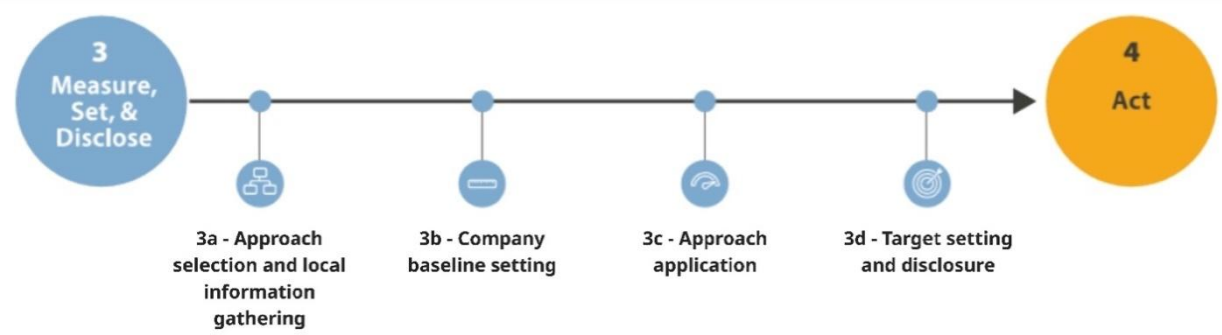


Figure 1: Within Step 3: Measure, Set, & Disclose, there are four main sub-steps that companies *must* follow. This technical guidance describes each of these in detail.

1.2 Freshwater method scope

This document provides technical guidance for Step 3: Measure, Set, & Disclose. It sets out how companies set Freshwater science-based targets to reduce three pressures: water withdrawals, nutrient loading, and the potential ecotoxicity impact of pesticides. Not every company will be able to use these methods for all its freshwater impacts. Table 1 summarizes what this version (V2.0) covers for setting Freshwater science-based targets for nature.

This guidance includes the following pressures on nature:

Water quantity ( ):

- Freshwater withdrawals from surface water bodies ( ) and groundwater ( ).

Water quality ( ):

- Nutrients ( )—The total amount of nitrogen and phosphorus entering a surface water body during a given time;
- Pesticides ( )—Potential ecotoxicity impact based on pesticide usage during a given time. Amount of Highly Hazardous Pesticides produced or traded.

These pressures are selected for two main reasons:

1. They are the pressures most relevant to the impacts many corporations pose on freshwater;
2. Established methods exist to define science-based targets to link these pressures to a healthy state of nature.

This version expands the scope of water quality targets to include chemicals, starting with pesticides. Pesticides were chosen due to their bioactivity by chemical design, direct release into the environment, and relatively abundant data availability compared to other industrial chemicals.

The scope of this version includes direct operations and upstream activities only. Upstream activities matter particularly for freshwater: around 45% of internationally traded virtual water is drawn from overconsumed sources, and most countries import water that is physically scarcer than the water they consume domestically (Su et al., 2026). Downstream impacts are excluded from reduction targets because robust methods for defining quantitative target levels for these aspects of business scope are not yet available. HHPs Cessation targets for pesticide producers and traders, however, already incorporate downstream impacts.

Biodiversity is inherently integrated into the Step 3 Freshwater methods. SBTN recognizes that the health of freshwater biodiversity and freshwater systems are interlinked and, in some contexts, *may not* even be distinguishable. As a result, actions taken to maintain or improve the state of nature will effectively support biodiversity. In Steps 1 and 2, companies *must* incorporate biodiversity state-of-nature metrics to prioritize action on Freshwater targets in basins critical for mitigating biodiversity loss. Recommended freshwater biodiversity metrics can be found in the Step 1 method.

Step 3 Freshwater methods consider biodiversity within the sub-step in which desired environmental conditions are set. For example:

- Water quantity thresholds account for maintaining or enhancing freshwater ecosystems, including the needs of specific species, using environmental flow requirements.
- Nutrient water quality thresholds are linked to the eutrophication risks that affect

ecosystems.

- Pesticide thresholds ***should*** be based on ecotoxicological effect test data for aquatic species (see Appendix A).

Further explanation on the inclusion of biodiversity is provided in the supplemental report, *Business action for biodiversity via science-based targets for nature*.

Stakeholder consultation and stakeholder engagement

In Step 3a, companies follow a stakeholder consultation process that supports them in selecting a target-setting approach to derive the basin-wide pressure reduction required (i.e., local, global, or pesticide fallback approach).

For clarity, this process is distinct but related to the broader stakeholder engagement process that a company ***should*** undertake throughout its target-setting journey. More information regarding the broader stakeholder engagement process is provided in SBTN's stakeholder engagement guidance, while recommendations for conducting stakeholder consultations for approach selection are provided in Appendix C.

Where specialist support is needed to apply models, tools, or assumptions, companies ***may*** also work with subject-matter experts (SMEs). In this guidance, "SME" always means subject-matter expert, not small and medium-sized enterprise. SME input does not count toward stakeholder consultation (Section 3.1.2).

1.3 Method applicability

The Materiality Screening Tool or the ENCORE database applied in Step 1: Assess, identifies which economic activities are likely to have material impacts on freshwater quantity and quality. In general, this includes:

- Sectors that rely on agricultural products in parts of their value chains;
- Sectors where water is incorporated into a product (e.g., the food and beverage industry);
- Sectors that use water for industrial processes (e.g., cooling).

These methods suit companies that know, or can reasonably estimate, where their direct operations and upstream activities are located. Freshwater pressures are assessed at basin level: Freshwater Quantity targets require traceability to Pfafstetter Level 5 basins, and Nutrient and Pesticide Freshwater Quality targets to Pfafstetter Level 6 basins. HHPs Cessation targets for pesticide producers and traders, and Pesticide Landscape Engagement targets, require less traceability. Future versions may expand the issues and impacts covered.

Box 1: Basin priority

Basins *should* have been evaluated based on the company's pressures and state of nature (including biodiversity). Companies *must* classify basins into the following categories:

- *Top-priority basins*: The highest 10% of basins based on the Step 2a or 2b ranking results, or the top 10 basins where more than 100 basins are considered material and have sufficient traceability.
- *Other priority basins:* All remaining basins that are considered material and have sufficient traceability.

Companies *should* note that:

- Step 2: Interpret & Prioritize ranking of basins *may* differ in terms of water quantity and quality, depending on their pressures and site conditions.
- A basin might be considered a top-priority basin for water quality but not for quantity.
- Companies *must* maintain separate rankings for validation purposes.

Rankings are made separately for each pressure, and targets are set for each pressure in that pressure's priority basins. Setting a target for one pressure in a basin does not require targets for other pressures that are material there, although companies are strongly encouraged to set them (see Rec. 1—Co-material pressures).

Req. 1—Disclosure of target coverage

Companies must disclose, with their validation submission and at each progress report, the coverage of their Freshwater targets relative to the material pressures identified in Steps 1 and 2. For each pressure (Freshwater Quantity, Nutrient Freshwater Quality, Pesticide Freshwater Quality), companies must report:

- The priority basins within the target boundary, identifying top-priority basins;
- The basins in which a target has been set;
- The share of the company's total material pressure for that pressure covered by targets.

Where the share cannot be estimated from Step 1b data, companies must report the number of basins covered and state why the share could not be estimated.

Rec. 1—Co-material pressures

Where more than one freshwater pressure is material in a basin in which a company sets a target, companies *should* set targets for each. This is common in agricultural value chains, where nutrient and pesticide pressures usually co-occur. Water quality and quantity targets also interact, since pollutant concentrations depend on flow: e.g., reducing a nutrient load while withdrawals continue to rise may not deliver the concentration outcome the target is aiming at.

Setting targets together lets corporate water strategies adopt a holistic approach, leverage similar data collection and management pathways, and support coordinated action across pressures.

Companies are also encouraged to prioritize basins that are top priority for more than one freshwater pressure, and that overlap with priorities for Land and Ocean science-based targets where applicable.

Where a company sets a target for only some of the material pressures in a basin, it should disclose the reason in its coverage disclosure (Req. 1 —Disclosure of target coverage).

Req. 2—Scope of claims

> Claims about Freshwater science-based targets *must* identify the pressures and basins covered. Companies *must not* state or imply that targets cover their full freshwater footprint unless all material pressures in all priority basins are covered. Claims *must* follow the SBTN Claims Guidance.

Table 1: Summary of content included in this second version of methods for setting Freshwater science-based targets for nature.

Content included	Content not included
Freshwater quantity	
• Surface water flows • Groundwater levels	
Freshwater quality	
• Nutrient pollution (nitrogen and phosphorus)[1] • Chemical pollution (pesticides)[2]	• Other freshwater quality parameters
Value chain scope	
• Upstream • Direct operations • Downstream (for pesticide producers and traders only)	• Downstream
Biodiversity and ecosystems	
• Biodiversity is included in the Step 1 and Step 2 prioritization of basins for freshwater target setting. It is also relevant for environmental flow requirements and nutrient concentration thresholds, which protect and restore freshwater species and ecosystems	• Freshwater species and direct conversion of freshwater ecosystems
Future projections	
• Consideration of forward-looking scenarios, including how continued climate change will impact groundwater levels	• Included only through the global groundwater model (GSGM-2), which reflects future climate conditions; not required for local approaches

1 A form of water pollution driven by excess levels of nutrients, primarily nitrogen (N) and phosphorus (P).

2 This version only provides guidance on the setting of freshwater quality targets related to pesticides. However, when assessing the local state of nature, other chemicals than pesticides might be included in mixture toxicity metrics.

1.4 Pesticide Freshwater Quality targets

Box 2: Chemical freshwater pollution and impact pathway.

Setting chemical targets, starting with a focus on pesticides in Freshwater V2 guidance, requires understanding their impact pathways. With an estimated 350,000 chemicals linked to global commerce, and a smaller fraction of that number used as pesticides, the complex emission, distribution, and exposure pathways, as well as the wide range of negative effects, regulatory evaluation, and management systems, often fail to sufficiently protect both people and nature (Scheringer & Schulz, 2025). Furthermore, data availability depends heavily on existing legal and monitoring frameworks. Additionally, regulatory frameworks often do not address the impact associated with mixtures of chemicals in water bodies (Kortenkamp et al., 2019). This guidance aims to help companies understand their impact and the context of local chemical pollution, as well as access local data, tools, and frameworks for reducing chemical pollution.

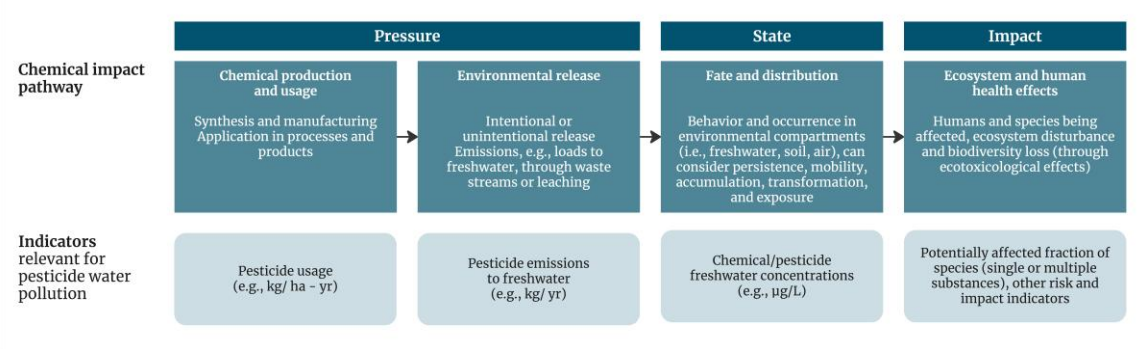


Figure 2: Impact pathway elements for chemical impacts and their positioning within the DPSIR framework. Indicators relevant for pesticide pollution. (Source: Adapted from Persson et al., 2022).

Defining appropriate indicators for assessing a company's contribution to chemical pollution and its impacts on human health and the environment, as well as related impact reduction efforts, requires an understanding of the impact pathways of chemicals. This can be described using the DPSIR framework as introduced in the SBTN Step 1 Technical Guidance (see Figure 2). Determining which chemicals to phase out or substitute with safer, more sustainable alternatives or pest management practices specifically for pesticides requires an impact-level approach, as different chemicals have different persistence and toxicity potential. This means that each chemical contributes differently to the overall impact, and the effectiveness of reduction depends on which chemical is reduced or avoided.

For setting pesticide impact targets, this means:

- Companies ***must*** assess their pressure (i.e., pesticide usage) at a potential impact level using a chemical footprint tool or method. Tools like SBTN's Pesticide Impact Quantification (PIQ) Tool provide background data on emission fractions and impact characterization factors to approximate the potential ecotoxicity impact on freshwater ecosystems. These tools ***may*** vary in terms of granularity, data requirements, and implementation effort.
- Companies ***should*** consider chemical mixtures in water bodies for determining a required impact reduction in a basin. Following the local approaches outlined in Section 3.1.1, local concentrations of chemicals ***may*** be predicted through hydrological and contaminant fate models or based on local measurements. Additionally, the toxicity of the mixtures and hence pesticide risks must be assessed (see Appendix A on chemical thresholds).

Overview of Pesticide Freshwater Quality target components

To support clarity and consistent application, the three pesticide target types address distinct but complementary dimensions of pesticide-related pressures:

- *Pesticide Impact Reduction target*
  Quantitative target to reduce a company's potential ecotoxicity impact on freshwater ecosystems within a defined basin or geography. This target is expressed as a percentage reduction of a company-specific total baseline ecotoxicity impact.
- *Highly Hazardous Pesticides (HHPs) Cessation target*
  (Semi-) quantitative target to phase out the production, trade, or use of pesticides classified as highly hazardous. The target can be set at the basin, company, or business unit level and applies to all HHPs within the selected scope. This target reflects precautionary action on substances with inherently high levels of hazard that are included in the PAN International List of Highly Hazardous Pesticides.
- *Pesticide Landscape Engagement target*
  Qualitative or semi-quantitative target for engaging in collective action within priority geographies, and in areas where data limitations or shared pressures hinder robust quantification of company-specific impacts. It allows more flexibility and supports reducing pesticide freshwater impacts through a more holistic agricultural transition, for example, by applying integrated pest management (IPM) strategies.

These three targets collectively address:

- Potential ecotoxicity impact on freshwater ecosystems (Impact Reduction);
- Intrinsic hazards beyond freshwater considerations (HHPs Cessation);
- System-level conditions and shared responsibility (Landscape Engagement).
- In this guidance, pesticide pressure is expressed as potential ecotoxicity impact: the potential impact on freshwater ecosystems from direct pesticide application. This covers part of a chemical footprint as defined under the Global Framework on Chemicals (GFC, 2026), which by default includes all relevant life-cycle stages and both human toxicity and ecotoxicity. Unless stated otherwise, "ecotoxicity impact" in this guidance refers to this scope.

Alignment with Step 3 reduction target-setting logic

Freshwater science-based targets follow a reduction framework: desired state of nature (threshold) → required basin-wide reduction → company allocation. Pesticide targets follow this logic only in part, because of data and methodological limitations:

- For Pesticide Impact Reduction targets under local approaches, companies can apply the full reduction target framework:
  - Identify a threshold or "safe" benchmark;
  - Determine the required basin-wide reduction;
  - Allocate the reduction to the company setting the target.
- For Pesticide Impact Reduction targets under the fallback approach, local resources *may not* allow for determining basin-wide reductions. In these cases, the reduction target logic is partially followed:
  - The company sets a reduction target against its own baseline, using the PIQ Tool or another chemical footprint tool to quantify the baseline potential

ecotoxicity impact and available local information to inform the target.

    - The reduction is at least 50%, following target 7b of the Global Biodiversity Framework (GBF); ambition may be increased based on local information.

- HHPs Cessation and Landscape Engagement targets do not follow the threshold-allocation logic:
    - HHPs Cessation targets are based on hazard elimination, not basin thresholds;
    - Landscape Engagement targets are based on collective action and system change.

This distinction reflects current scientific constraints while maintaining alignment with the objective of reducing pressures to levels compatible with the desired state of nature.

Figure 3 shows the integration of pesticides throughout the steps.

- Pesticide producers and traders need only Step 3b (baseline setting) and the HHPs Cessation target section (Section 3.5.2)
- Companies setting Pesticide Impact Reduction targets follow all sub-steps (see Req. 4—Applicability conditions of Pesticide Impact Reduction and HHPs Cessation targets)
- Companies setting only Pesticide Landscape Engagement targets may build on Steps 3a–3c. They must also establish whether pesticides used locally are sufficiently monitored and whether environmental quality standards or thresholds exist (Step 3a; Case 1 in Req. 5—Applicability conditions of Pesticide Landscape Engagement targets). For companies setting Pesticide Impact Reduction and HHPs Cessation targets, Cases 2 and 3 may be triggered in Step 3b or by an HHP exemption (Section 3.5.2).

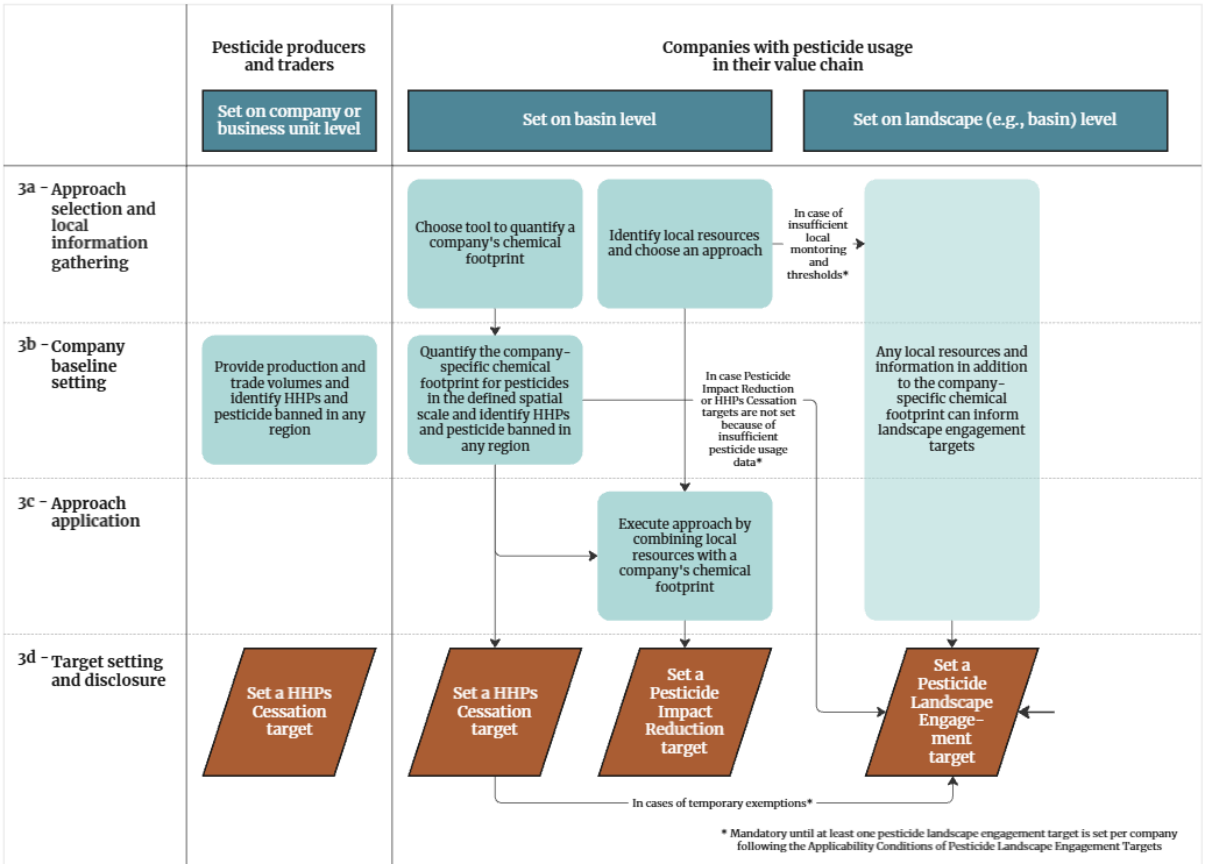


Figure 3: Overview of pesticide targets and their integration in the guidance. Note that at least one Pesticide Landscape Engagement target must be set per company. For more information on applicability of pesticide targets and exemptions review Reqs. 4 and 5 below.

Applicability of pesticide targets

The pesticide targets a company sets depend on its role in the value chain, its traceability, and pesticide data availability (Table 2):

Table 2: Pesticide targets by company role and traceability.

Company role and traceability	Pesticide Impact Reduction	HHPs Cessation	Pesticide Landscape Engagement
Pesticide producers and traders	–	*Must*† (company or business-unit level)	–
Pesticide usage in the value chain, producing commodities that require the usage of pesticide or sourcing from the first or second point of aggregation from the producer	Must*	Must*†	*Must* (at least one per company)
Pesticide usage in the	Should*	Should*†	*Must* (at least one per

upstream value chain, sourcing only from a point downstream of the second point of aggregation			company)

* Unless available pesticide usage data do not meet the data requirements (Req. 42—Pesticide Usage Baseline Reporting).

† Where HHPs are produced, traded, or used.

Req. 3—Applicability conditions of HHPs Cessation targets for companies producing or trading pesticides

Companies producing or trading pesticides ***must*** set an HHPs Cessation target on a business unit or company level.

Req. 4—Applicability conditions of Pesticide Impact Reduction and HHPs Cessation targets for companies with pesticide usage in their value chain

Companies with pesticide use in their value chain and traceability to the producer or to the first or second point of aggregation ***must*** set Pesticide Impact Reduction and HHPs Cessation targets. Companies that can only trace sourced commodities to a point downstream of the second point of aggregation ***should***[3] collect pesticide usage information, calculate their baseline, and set these targets.

If available pesticide usage data do not meet the outlined requirements (see Req. 42—Pesticide usage baseline reporting), a Pesticide Impact Reduction target and HHPs Cessation target do not need to be set. However, supply chain and local engagement are encouraged to improve pesticide usage data availability. Companies ***may*** also choose to set an HHPs Cessation target without exact quantification of HHPs mass used in their supply chain.

If a Pesticide Impact Reduction target or HHPs Cessation target cannot be set, a Pesticide Landscape Engagement target ***must***[4] be set in the specific basin (see Case 2 in Req. 5—Applicability conditions of Pesticide Landscape Engagement target).

Req. 5—Applicability conditions of Pesticide Landscape Engagement targets

Companies ***must*** set at least one Landscape Engagement target per company following one of the three cases below:

In locations with traceability to Pfafstetter Level 6 basins (direct operations or Upstream target boundary A), the landscape initiative ***must*** be located within the

[3] Pesticide Impact Reduction and HHPs Cessation targets may be set with proxy data based on local pesticide usage even if the exact production unit cannot be identified. For details, refer to the PIQ Tool Manual. Whether proxies were used will be communicated with the target as shares of different pesticide usage data representation levels.

[4] Companies must set a Pesticide Landscape Engagement Target unless a target has already been set based on the three cases outlined in Req. 5. If this is the case, companies should set a Pesticide Landscape Engagement target but are not required to.

company's top-priority basins (Box 1) where substantial pesticide impacts and pollution can be shown based on local data. Basins where the following cases apply *must* be prioritized:

- Case 1: Pesticides used locally are not sufficiently monitored or do not have environmental quality standards/thresholds defined in a priority basin.
- Case 2: A Pesticide Impact Reduction target or Highly Hazardous Pesticide target is not set either because a company is too far removed from the value chain stage in which pesticides are used, or because pesticide usage data are insufficient to quantify a company's baseline.
- Case 3: A temporary exemption for at least one HHP is granted in a priority basin.

Companies are encouraged to set Pesticide Landscape Engagement targets in all basins where those cases are met.

Minimum data requirements

Setting Freshwater science-based targets requires data collection and management. Please see Step 1: Assess guidance for information on how companies can leverage existing work, capacities, and resources when setting science-based targets for nature.

Companies *must* collect data to establish a baseline for each pressure in scope (referred to in Steps 1 and 2 as freshwater use and pollution), across all basins in scope within their direct operations and upstream activities. Data that differ in completeness, resolution, or source may be combined. Any assumptions must be transparent, internally consistent, and conservative wherever uncertainty exists. Primary and secondary data, as well as direct operations and upstream activities, *must* be kept separate in baseline reporting but *may* be aggregated for basin-level target setting. Baselines *must* follow the baseline hierarchy in Section 3.2.2. Table 3 summarizes the minimum data requirements.

Table 3: Minimum data requirements for quantifying company baseline pressure.

	Data requirement	Data sources	Unit of measurement
Freshwater quantity			
Direct operations	Nature of water source (surface or groundwater)	Water provider	
	Primary/direct measurements	Water meter	Volume per month, e.g., ML/month
Upstream	Nature of water source (surface or groundwater)	Water provider	
	Primary/direct measurements (preferred, if available)	Water meter or water diversion	Volume per month, e.g., ML/month
	Secondary (estimated)	Blue water footprint, or modelled crop water use, applied to procured volume or crop area	Volume per month, e.g., ML/month (or ML/year where only annual values are available)
Nutrient freshwater quality			
Direct operations and upstream	Primary/direct measurements (point sources)	Discharge flow and nutrient concentration	Volume per month, e.g., ML/month (for discharge flow) Mass of nutrient per volume, e.g., mg P/L (for nutrient concentration)

	Secondary (nonpoint sources)	Model results of nutrient load or Gray water footprint	Mass of nutrient load per month or year, e.g., kg P/year (if based on model results of nutrient loads) or Volume per year, e.g., ML/year (if based on gray water footprint)
Pesticide freshwater quality			
Companies with pesticide usage in their value chain	Primary (direct operations) Pesticide (active ingredient) usage Pesticide name and CAS registry number (Input requirements might differ slightly based on the chemical footprint tool selected in Step 3a)	Company records or Farmer surveys	Total mass of pesticide used (active ingredient) per year (i.e., across one or multiple applications and fields/crops), e.g., kg/year Units for other inputs vary
	Secondary (upstream) Pesticide (active ingredient) usage Pesticide name and CAS registry number (Input requirements might differ slightly based on the chemical footprint tool selected in Step 3a) or Model results of pesticide usage or potential ecotoxicity impact (only if footprint tool criteria are met)	National and subnational statistics or Farmer surveys or Published studies, assessments, or other credible sources (e.g., identified through desktop research), if based on national or subnational data and representing actual usage or Model results of pesticide (active ingredient) usage or potential impact if based on national or subnational data For details on the types of secondary data allowed and data processing requirements refer to the PIQ Tool Manual	Total mass of pesticide used (active ingredient) per year (i.e., across one or multiple applications and fields/crops), e.g., kg/year Units for other inputs vary

Pesticide producers and traders	Primary Mass of HHP pesticide (active ingredients) produced or traded	Company records	Mass (HHP active ingredients) per year

Detailed application of these data requirements for baseline calculation is provided in Section 3.2.

Process for setting Freshwater science-based targets

Sections 3.1 to 3.5 follow the sub-steps: selecting an approach and gathering local information (Step 3a, Section 3.1), establishing baseline values (Step 3b, Section 3.2), and setting Freshwater Quantity and Quality targets (Steps 3c and 3d, Sections 3.3 –3.5).

Step 3a. Approach selection and local information gathering

3.1 Overview of the approach selection and local information gathering process

What this section produces: A documented approach selection for each basin and pressure, with the evidence supporting it, ready for validation.

How it works: Three tasks.

1. Check SBTN's Target Tracker and Basin Threshold Tool for prior targets set in the basin, or existing local thresholds and models.
2. Consult stakeholders to identify and assess local resources and, where applicable, the global model, to determine whether the basin qualifies for a local approach.
3. Document the approach selection for target validation.

Together, the three tasks above guide companies toward selecting an approach that is scientifically grounded, locally appropriate, and can be validated, while promoting alignment among companies operating in the same basin. Sections 3.1.2 and 3.1.3 further explain each of these tasks, while Section 3.1.1 provides background information on the approaches.

In this guidance, an "approach" is the structured methodological pathway that a company selects in Step 3a to determine a basin's maximum allowable pressure and calculate the required basin-wide reduction. An approach combines data, models, thresholds, and other local resources.

Depending on what information is available for the basin and pressure, companies *may* use any of the approaches in the list below.

- A local approach, which uses basin-specific models, monitoring data, thresholds, assessments, tools, or government-established environmental objectives to determine the maximum allowable level of basin-wide freshwater withdrawals, nutrient loads, or pesticide impact.
- A global approach for Freshwater Quantity or Nutrient Freshwater Quality targets, which uses SBTN-approved global models where suitable local information is not available.
- For Pesticide Impact Reduction targets: a pesticide fallback approach where an appropriate local approach cannot be applied. This approach uses the company's potential ecotoxicity impact to set a reduction target against the company's own baseline and applies at least a 50% reduction based on Target 7b of the Global

Biodiversity Framework.

Companies select the applicable approach based on the availability and suitability of basin information.

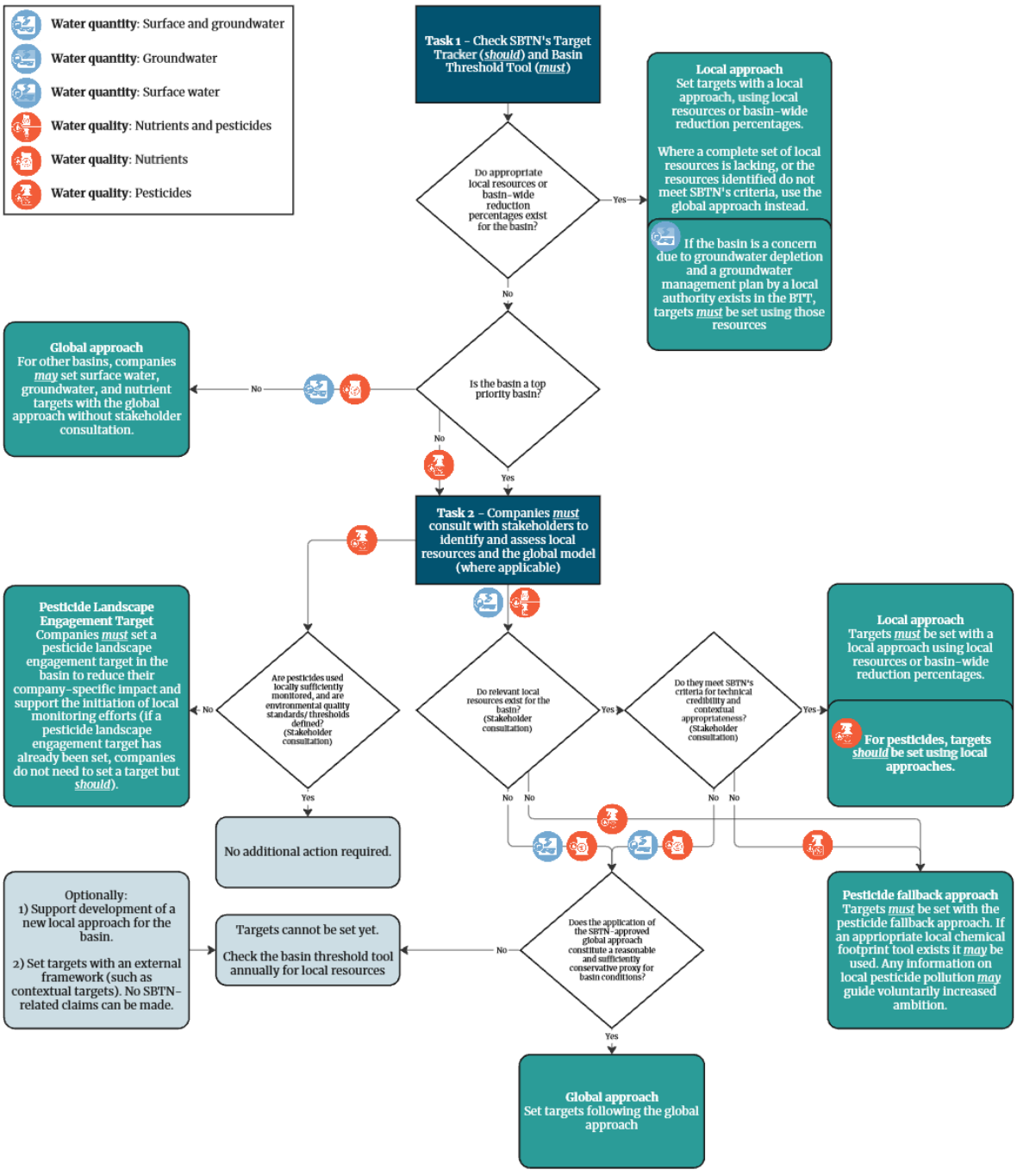


Figure 4: Decision tree for approach selection. Companies must use it to determine the approach for each basin selected for target setting in Step 2: Interpret & Prioritize.

3.1.1 OUTLINE OF APPROACHES

Freshwater science-based targets rely on local information to indicate what a given ecosystem and its users need. The need for location-specific inputs to set Freshwater science-based targets is demonstrated through the following examples:

- The environmental flow (e-flow) requirements representing the desired state of nature in a lowland river will be different from the e-flow requirements for a headwater stream.
- Nutrient levels that result in acceptable algal growth in a clear lake with high levels of sunlight penetration will differ from those in a turbid stream with little sunlight penetration.
- The relationship between nutrient load and the resulting state of nature will depend on the hydrologic characteristics of the receiving water body. Much of the phosphorus (P) load delivered to a slow-moving water body may settle out of the water column prior to being carried to downstream reaches, while the P load delivered to fast-moving streams may not settle out.
- Every basin has unique chemical mixtures, and regionally varying aquatic species have different sensitivities to them (see Appendix A for more on chemical thresholds).

For Freshwater science-based targets to be effective, pressure mitigation and implementation actions *must* be applied in the local basin[5]. Basin-specific conditions are therefore required to:

- Determine the threshold values representing the desired state of nature;
- Understand the current state of nature related to the specific pressure;
- Define the relationship between the pressures and the desired state of nature;
- Set Freshwater science-based targets.

The information available to do this varies considerably between basins. In some locations, companies may have access to detailed local monitoring data, models, thresholds, assessments, or government-established environmental objectives. In others, little or no suitable local information may be available. The time, technical expertise, and effort required from a company will therefore also vary depending on the information available and the complexity of the method used.

Because many parts of the world do not yet have the local resources needed, SBTN accepts both local and global approaches for Freshwater Quantity and for Nutrient Freshwater Quality targets. Similarly, a pesticide fallback approach for Pesticide Impact Reduction targets is accepted.

The approach selection *must* correspond with local data availability, be consistent with SBTN selection criteria (see Appendix B), and meet SBTN stakeholder consultation requirements. Where multiple local approaches are available, companies *may* select any option.

Appropriateness of resources

For all approaches, the appropriateness of the underpinning resources is assessed across two complementary dimensions that *must* both be met:

1. *Technical credibility:* The resource *must* meet the relevant SBTN criteria for models, thresholds, and other analytical resources (see Appendix B). These criteria ensure that methods are scientifically robust, transparent in their assumptions and limitations, and fit for defining relationships between pressures and the state of nature.
2. *Contextual appropriateness:* The resource *must* also be suitable for the specific basin in which it will be applied. Companies assess this through stakeholder consultation to

[5] Further information and reasoning for the importance of taking a local approach when setting Freshwater science-based targets can be found in Vollmer and Harrison, 2021.

confirm that the selected approach and its underlying resources are suitable for basin-specific ecological, hydrological, and governance conditions.

Stakeholder consultation (Task 2, Section 3.1.2) informs, but does not replace, the assessment of technical credibility. Stakeholders are not expected to validate models or calculations, but to comment on the suitability, limitations, and relevance of the approach for the basin. Companies remain responsible for demonstrating that both dimensions are met, and validators assess whether the evidence is sufficient.

Operationalizing contextual appropriateness

For Step 3, a resource is considered contextually appropriate when it is suitable for the specific basin in which it will be applied. In addition to meeting the technical credibility criteria in Appendix B, companies must assess whether the resource meets all of the following criteria:

- *Ecological and hydrological relevance:* Resources reflect basin-specific conditions, including pressures on the state of nature, and are aligned with the desired ecological outcomes.
- *Scientific robustness in context:* Methods, data inputs, and assumptions are transparent, based on credible sources (e.g., peer-reviewed literature, government data, or established tools), and appropriate for the basin in which they are applied.
- *Scale alignment:* Spatial and temporal resolution of the resource aligns with the selected basin boundary, baseline period, and applicable thresholds.

These dimensions *must* be assessed and supported through stakeholder consultation (see Section 3.1.2).

Application across approaches

Companies *must* demonstrate that the resources they use are appropriate for the basin and the selected approach. Appendix B sets out the detailed criteria for models, thresholds, tools, monitoring data, and other resources, and forms the primary basis for validation. What companies need to demonstrate depends on the approach (Table 4).

Table 4: What companies must demonstrate for each approach.

Approach	What the company must demonstrate	Role of stakeholder consultation
Local Approach	The models, thresholds, assessments, tools, or other resources meet the SBTN technical criteria (Appendix B), are contextually appropriate for the basin, are internally consistent when combined, and adequately represent the relationship between pressure and the state of nature.	Assess whether the specific resources and approach are suitable for the basin.
Global Approach	SBTN has already approved the global models and thresholds for technical credibility; the company *must* show that the global approach is appropriate for the basin. Results are available in the Basin Threshold Tool and the SBTN	In top-priority basins, confirm whether the global approach is a reasonable and sufficiently conservative proxy for basin conditions and whether more suitable local resources exist.

	State of Nature Water Layers app (groundwater and nutrients, McDowell et al., 2025), and on the Water Footprint Network platform (Hogeboom's water quantity global model).	
Pesticide fallback approach	The company calculates its potential ecotoxicity impact with SBTN's Pesticide Impact Quantification (PIQ) Tool or another chemical footprint tool that meets the SBTN criteria.	Identify local information on pesticide pollution, monitoring gaps, and thresholds. This can inform target ambition and actions, and *may* trigger a Pesticide Landscape Engagement target.

Req. 6—Appropriateness of resources

For all approaches, companies *must* ensure that selected resources are internally consistent when combined, adequately represent the relationship between pressures and the state of nature, and are supported by evidence of both technical credibility and contextual appropriateness.

Companies *must* document the methods, assumptions, limitations, and relevant stakeholder input used to support this assessment.

Selecting between local, global, and pesticide fallback approaches:

SBTN does not rank local approaches: where several meet SBTN's criteria for the same basin, companies *may* choose any, based on the suitability and robustness of the underlying resources.

Req. 7—Selecting the global or pesticide fallback approach

For Freshwater Quantity and Nutrient Freshwater Quality targets, companies *may* use the global approach **only** where both of the following apply:

a) No complete local resource set (a model and threshold, or an equivalent combination in Table 6) has been identified through the Basin Threshold Tool, desktop research, or stakeholder consultation, or the local resources identified do not meet the criteria in Appendix B.; **and**
b) In top-priority basins, stakeholder consultation confirms that the SBTN-approved global model is a reasonable and sufficiently conservative proxy for basin conditions and has not identified a clearly superior local approach. In other priority basins, consultation is not required where the Basin Threshold Tool identifies no local resources (Section 3.1.2).

For Pesticide Impact Reduction targets, companies *should* use a local approach where a complete local resource set meeting Appendix B criteria is available. Otherwise, they *must* use the pesticide fallback approach (Section 3.5.1.4).

Companies *must* apply this logic using the decision tree in Figure 4.

Local approaches *may* produce targets that differ from those of global models because they

reflect basin-specific data, thresholds, management conditions, and ecological characteristics. A lower reduction does not invalidate a local approach that meets SBTN criteria and validation requirements.

Section 3.1.2 provides additional information on selecting (local) resources, and Appendix C provides recommendations for conducting consultations.

The approaches are summarized below and are described in further detail in Steps 3c and 3d (Sections 3.3-3.5). The icons indicate the pressures to which an approach is applicable:

Local approach ():

Under the local approach, companies build on basin-specific resources, tools, and thresholds to determine the maximum allowable level of basin-wide freshwater withdrawals, nutrient loads, or pesticide impact.

For pesticides, the local approach uses chemical footprint tools applied locally to define the company's potential ecotoxicity impact in a basin. These are "source-to-impact" tools that combine usage, emissions, and impact potential. The Pesticide Projector in Queensland, Australia is one example (see Box 3). These tools provide relative and comparative indicators of potential impact rather than precise estimates of environmental concentrations, supporting directional decision-making.

Depending on the type and quality of local information available, companies *may* apply a local approach in three different ways:

1a. Direct application of local models or methods:
Under this approach, companies run an existing model or apply an existing method to test different withdrawal or pollution scenarios and determine the maximum allowable pressure needed to meet a local threshold. Applying this approach *requires*:

a) Access to the model

b) Sufficient local data

c) Technical capacity to run simulations.

It is most appropriate when the model has been previously applied within the basin and is supported by basin authorities, rights holders, or technical stakeholders. In some cases, particularly for groundwater, local models *may not* always be superior to global models, due to limitations in the model domain **and** other factors. SBTN model selection criteria are provided in Appendix B.

Regionalized global models. A global model that has been regionalized for the basin(s) under consideration *may* be applied as a local model under this option, provided the company can demonstrate basin-level performance. Regionalization means the model has been parameterized, calibrated, or validated against observed conditions in each basin where it is applied—for example, a global hydrological model run at finer resolution using national input data and evaluated against gauged flows. A model that is only available at global resolution, or asserted to be appropriate without basin-level evidence, does not qualify.

Regionalized global models are assessed against the local model selection criteria in Appendix B, not the global approach approval criteria, and are subject to the stakeholder consultation requirements for local resources set out in Section 3.1.2. Companies *must* document, for each basin: the regionalization performed, the evidence of basin-level performance, and stakeholder confirmation of contextual appropriateness.

Req. 8—Groundwater local approaches

> For groundwater, including integrated surface water–groundwater models, companies *may* use a local approach only where a designated water management agency has applied the model as part of a recognized groundwater management plan. The plan's

abstraction limits or company-specific allowable pumping are then the basis for the target.

Where no such plan exists, companies *must* apply the global approach if stakeholders confirm that it is appropriate. Where neither is available, no valid approach exists, and therefore groundwater targets cannot yet be set in that basin.

For pesticides, the process *may* also include applying methods to assess chemical risk or impact based on predicted (modeled) or measured concentrations in water bodies, i.e., bringing together state of nature indicators with thresholds. Additionally, subject-matter experts *must* support the application of models or methods.

1b. Back-calculation from existing results ( ):
Under this approach, companies use existing model, monitoring, or assessment results rather than rerunning a model. This approach can be chosen when local (e.g., basin-wide) assessments like environmental flow analyses, water quality reports, or mixture toxicity reports exist that include:

- Model or monitoring results that quantify the present-day pressure-specific state of nature (e.g., stream flow, nutrient, or chemical concentrations) based on current pressures exerted in the basin.
- A threshold is defined that represents the desired state of the freshwater system (e.g., environmental flow requirements, ecological water quality standards, or acceptable chemical impact or risk levels). Or, for pesticides, a "safe" benchmark representing an acceptable chemical impact or risk level.
- And ideally, the required percentage for basin-wide reductions in withdrawal, nutrient load, or chemical impact *should* be specified.

These inputs are used to determine the pressure reduction needed to remain within the local threshold. Typical information requirements depend on the type of pressure addressed (see Table 5).

Table 5: Typical information for target setting through back-calculation.

Surface water	Nutrients (Nitrogen, Phosphorus)	Pesticides
For surface water withdrawals, back-calculation is based on the concept of excess withdrawals, defined as the amount by which present-day withdrawals exceed levels consistent with environmental flow (e-flow) requirements. Sufficient information typically includes: • Basin- or catchment-level environmental flow requirements; • Estimates of natural	For nutrients, back-calculation relies on existing freshwater quality model results and the assumption that instream nutrient concentrations are proportional to nutrient loading rates. Sufficient information typically includes: • Model results representing present-day instream nutrient concentrations at the basin- or water-body level; • A defined threshold	For pesticides, the back-calculation approach builds on local chemical impact or risk assessments for freshwater quality, using defined "safe" benchmarks (see Box 3 for a local example). Sufficient information typically includes: • Local predicted (modeled) or measured concentrations of pesticides (and potentially other chemicals) expressed in chemical risk or impact (see mixture toxicity or Appendix A on PAF and

flow, present-day streamflow, and present-day withdrawals.	nutrient concentration representing the desired ecological state.	msPAF). • A clearly defined "safe" benchmark (e.g., negligible or low risk, protection of 95% or 99% of species). • Inclusion of most pesticides used locally. • Stakeholder guidance on how to address spatial and temporal variability, including how to aggregate or select representative chemical impact or risk values.

Req. 9—Documentation of back-calculation

Where companies derive the required basin-wide reduction by back-calculation from existing results, they ***must*** document the methodology applied and justify the choice of data sources. Documentation ***must*** be sufficient for a validator to reproduce the calculation, including the data used, any locations or records excluded and the reason for each exclusion, and how multiple sources were combined.

Req. 10—Temporal basis for back-calculation

Where the required basin-wide reduction is derived by back-calculation, companies must apply the calculation over the full period covered by the source results and use the 75th percentile of the resulting required reductions. Where that period is shorter than the baseline period in Section 3.2, or is not stated, companies ***must*** apply it over the baseline period and state why the period used is representative.

This requirement does not apply to Freshwater Quantity targets derived by back-calculation from e-flow information, where the percentile is taken per month across years as set out in Section 3.3.1.

Box 3: Great Barrier Reef Catchment Case: Managing pesticides for water quality.

Queensland, Australia, offers a strong example of science-based water quality governance for pesticides, linking ecological targets, mixture-toxicity monitoring, on-farm pesticide management, monitoring, and collaboration across government, researchers, industry, and landholders.

The Great Barrier Reef is one of the world's most important marine ecosystems, and poor water quality is a major pressure on its habitats. In addition to targets for nutrients and sediments, Queensland's Reef 2050 Water Quality Improvement Plan sets a clear target for pesticides: keep concentrations low enough to protect at least 99% of aquatic species at end-of-catchments. To assess progress toward that goal, Queensland uses the Pesticide Risk Metric, which estimates the combined ecological risk of pesticide mixtures. The metric accounts for ecological risks that single chemical assessments might miss and provides a dashboard with current monitoring information. Queensland also uses the Paddock to Reef Integrated Monitoring, Modeling and Reporting Program, which tracks and evaluates management practices and water quality. The Catchment Water Quality Alliance, a collaboration between government and academia, now further supports the framework. This approach strengthens water quality monitoring, data sharing, and regional stakeholder engagement. In the Mackay–Whitsunday region alone, nearly 500 projects were completed to improve farming practices for water quality. In Project Bluewater, technical assistance was provided to 75 growers, including a chemical footprint tool, the Pesticide Projector, which has so far resulted in a 26% reduction in aquatic ecosystem risk while maintaining productivity (Neelamraju et al., 2025).

1c. Alignment with government-established environmental objectives (*):*

Under this approach, companies use freshwater-related environmental objectives as the basis for target setting. Governance bodies may establish these objectives at the basin, subnational, national, or regional level. These *may* include:

- Objectives on thresholds or the desired state of nature (e.g., environmental flow requirements, water quality standards, or 99% of species protected at the end of catchment as described in Box 3).
- Pressure-reduction goals (e.g., water allocations, nutrient or pollution caps, pesticide impact or risk reduction targets), which are based on a desired state of nature, e.g., directly connected to maintaining minimum environmental flow requirements through a model, method, or tool.
- Pressure-reduction goals (e.g., reducing various pesticide risk metrics by at least 10% by 2030 in the UK's National Action Plan (NAP)), which are not directly connected to a desired state of nature but allow for a relative, directionally correct reduction of relevant pressures.
- Broader freshwater restoration and protection commitments (e.g., national or catchment goals made under initiatives like The Freshwater Challenge).

These objectives *may* be set through regulatory instruments, formal policies, or strategic basin plans, and are not limited to minimum compliance thresholds. Where they reflect ecologically protective intent, are recognized by relevant basin authorities or governance bodies, and meet the conditions in Appendix B, companies *may* use them directly to determine the maximum allowable basin-wide pressure. Where they do not directly define a pressure reduction, they are combined with approaches 1a or 1b. The aim is to align company targets with publicly established environmental outcomes, not just minimum

legal requirements.

Consideration for regulated contexts: Where governmental environmental objectives are implemented through binding legal requirements, companies *may* face constraints in setting or communicating corporate targets that directly mirror those requirements. In such cases, governmental objectives can still serve as important reference points for defining desired freshwater outcomes, while companies establish targets that reflect their specific contribution toward achieving or maintaining those outcomes.

Req. 11—Subject-matter expert support for back-calculation

The following apply to all pressures.

A subject-matter expert (SME) is *not required* where the source already states the required basin-wide reduction and already derives it over the full period of the source results using the 75th percentile [Req. 10—Temporal basis for back-calculation]. No methodological judgment is involved in that case, and the company must state this.

An SME is *recommended* where the company combines multiple datasets, or makes methodological judgments, that do not meet the conditions below.

An SME is *required* where the company:

- Selects the temporal aggregation, percentile basis, or benchmark because the source does not specify it;
- Selects or modifies a "safe" benchmark, or aggregates across assessments using different benchmarks;
- Combines local resources under Appendix B Section 5;
- Makes an interpretive choice that the source does not specify, such as selecting among monitoring data or transferring parameters from another basin (see Section 3.1.2(c)).

Without SME input, the aggregation rule in Req. 10—Temporal basis for back-calculation applies as stated. An engaged SME may determine a different aggregation where the structure of the underlying data makes the default inappropriate. The company must then record the aggregation applied and the data characteristics that justify it. A different aggregation *must not* be selected on the basis of the resulting reduction percentage.

Where an SME is engaged, the company *must* identify them under Req. 16—Subject-matter expert identification.

Global approach: ( ):

Under the global approach, companies use an SBTN-approved global model to determine the required basin-wide pressure reduction.

This approach is intended for basins where no appropriate local approach is available. Global models and thresholds represent the best available science for setting directionally correct targets. SBTN maintains one approved global model per pressure, applied in its standard, globally consistent form, so that results are comparable across companies and basins. A global model that has been regionalized and validated for a basin is treated as a local resource under approach 1a.

The global approach is currently only available for Freshwater Quantity and Freshwater Quality (nutrients) targets. For pesticides, there is currently no comprehensive dataset that

links usage to predicted environmental concentrations and freshwater quality thresholds. SBTN aims to integrate such a dataset in future updates as it becomes available. In the absence of appropriate local resources and approaches, companies may still set pesticide targets based on their own ecotoxicity impact (see pesticide fallback approach).

Pesticide fallback approach: ( ):

The pesticide fallback approach applies only to Pesticide Impact Reduction targets. The HHPs Cessation and Pesticide Landscape Engagement targets follow different target-setting approaches (see Section 1.4).

Where a local approach cannot be applied, companies set a Pesticide Impact Reduction target of at least 50%, in line with target 7b of the Global Biodiversity Framework (GBF). The reduction applies to the total baseline ecotoxicity impact, calculated with the PIQ Tool or a local chemical footprint tool that meets the criteria in Appendix B.

As with the global approach, the pesticide fallback approach provides a directionally correct target based on available science when local options are not available or feasible.

Even if local resources do not meet SBTN criteria for applying a local approach, they can still inform when the target ambition should be voluntarily increased by highlighting:

- High chemical or pesticide water pollution risk or impact;
- High company impact;
- Multiple pressures on the local ecosystems (e.g., nutrients and pesticides).

Local water quality dashboards or monitoring reports (e.g., the Pesticide Atlas deployed in the Netherlands) may provide this information.

How the approaches *may* be combined:

Please note that the approaches outlined above *may* build on each other. For example:

- Local approaches *may* use thresholds from global models under specific circumstances.
- Results from the direct application of local models or methods to translate concentrations into mixture toxicity *may* be used for the back-calculation.
- Government-established environmental objectives or frameworks might provide the resources to set a target through direct application or back-calculation, but they do not directly define a pressure reduction.

The worked example below follows the decision tree in Figure 4 through three basins.

Box 4: Worked example—approach selection across three basins.

A beverage company has three priority basins for Freshwater Quantity targets.

Basin	Situation	Path through Figure 4	Approach
A (top-priority)	The Basin Threshold Tool lists a local hydrological model approved by the basin authority, with local e-flow thresholds.	Task 1 only; the company documents this in Task 3.	Local approach (1a)

B (other priority)	Nothing in the Target Tracker or the Basin Threshold Tool.	Task 1 only; the company documents this in Task 3.	Global approach, without full consultation
C (top-priority)	Nothing in the Basin Threshold Tool; no response from stakeholders in two categories after eight weeks and two follow-ups.	Task 2 outreach fails; the company documents its own assessment that the global model is appropriate.	Global approach (local approaches not permitted)

In each basin, the company then sets its baseline (Step 3b) and calculates its target (Section 3.3).

3.1.2 INFORMATION GATHERING, ASSESSMENT, AND APPROACH SELECTION

Mapping of (local) resources and criteria

Table 6 below outlines analytical resources that *may* be used for defining basin-level pressure reductions and subsequent company-specific pressure reduction targets.

Where local resources are incomplete, companies *may* combine local and global resources where permitted (see below). Complete, internally consistent local resource sets are preferred over mixes of higher- and lower-quality components.

Allowable combinations of resources

To define basin-level pressure reductions and corresponding company-specific targets, selected resources *must* be combined in a manner that satisfies the three required components introduced in Section 1.1:

- *Component 1—Current condition:* Data on pressure and pressure-related state of nature;
- *Component 2—Desired condition:* Threshold(s) defining the desired state of nature; and
- *Component 3—Pressure-state relationship:* Method to link pressure to the desired state of nature or an approximation thereof.

Based on these requirements, the following combinations are considered allowable for each approach to derive a basin-wide percentage reduction:

- *Direct application:* model, method, or tool that links pressure to the state of nature + threshold (+ chemical footprint tool for pesticides).
- *Back-calculation:* observed or modeled state of nature + threshold (+ chemical footprint tool for pesticides).
- *Global approach:* pre-integrated analytical resources that combine state, thresholds, and pressure–state relationships. Local thresholds may be paired with global model results only where the combination produces a more stringent target.
- *Pesticide fallback approach:* chemical footprint tool (+ any additional resources where available).

- *Alignment with government-established environmental objectives*: *may* substitute for thresholds or reduction values only where the underlying ecological basis is demonstrably aligned with SBTN criteria. Where this basis is unclear, supplementary resources (models, assessments, or expert input) are required.

Where resources are incomplete, companies *may* apply combinations of local and global resources, provided that:

- All three required components are adequately represented;
- Assumptions are transparent and conservative where uncertainty exists;
- The combined resource set is internally consistent.

For pesticides, complete resource sets *may not* exist, and application and interpretation might require subject-matter expertise. Therefore, suitable combinations of local data, tools, and expert-supported assumptions *may* be used to approximate basin-wide reductions and company-specific reduction targets. Even if a local approach cannot be followed, local resources can provide important insights, allow for alignment with local frameworks, and guide actions.

Further detail on resource types and combinations is provided in Table 6.

Table 6: Analytical resources for defining basin-level pressure reductions and subsequent company-specific pressure reduction targets.

Resource Type	Description	Role	Supports which approach(es)	Related criteria in Appendix B
Threshold	Boundary value of an environmental indicator beyond which ecological conditions begin to shift away from the desired state of nature (e.g., water quality standards, and minimum flow requirements)	Defines the environmental limit (component 2)	All approaches	Threshold selection criteria
Local model	Hydrological, ecohydrological, water quality, or contaminant fate models to model the pressure exerted on the environment and the resulting state of nature (e.g., pollutant concentrations) adjusted to the local conditions and based on local data. Local models can be used to derive	Links pressure to the desired state of nature and defines the state of nature (components 1 and 3). Defines environmental limit if thresholds are integrated (component 2)	Direct application	Local model selection criteria (if thresholds are integrated, also threshold selection criteria)

	the required basin-wide pressure reduction to meet a threshold or spatially resolved pressure reductions that can be aggregated to a basin level.			
Local model results	Outputs from local models (e.g., concentrations, flow estimates)	Represents state of nature (component 1) Defines environmental limit if thresholds are integrated (component 2) and the link between pressures and desired state of nature (component 3)	Back-calculation	Local model selection criteria (if thresholds are integrated, also threshold selection criteria)
Monitoring Results	Studies, datasets, dashboards or reports that contain relevant metrics on current pressures and pressure-specific state indicator (e.g., pollutant concentrations) based on monitoring, observations, and measurements.	Represents state of nature (component 1)	Back-calculation	Monitoring and assessment criteria
Local assessment	Studies, datasets, dashboards or reports that are based on local model results or monitoring results that already integrate thresholds. Additionally, they may contain the required basin-wide pressure reduction or spatially resolved pressure reductions that	May provide state + threshold + reduction gap (components 1 + 2 + 3 partially)	Back-calculation, Government established environmental objectives	Threshold selection criteria, local model selection criteria and monitoring and assessment criteria

	can be aggregated to a basin level.			
Local method or tool	Methods, tools, or frameworks to derive the required basin-wide reduction or spatially resolved pressure reductions that can be aggregated to the basin level. For example, current pollutant concentrations can be used as inputs for the Key Factor Toxicity tool (the Netherlands) to obtain mixture toxicity metrics that incorporate thresholds.	May provide state + threshold + reduction gap (components 1 + 2 + 3 partially)	Direct application	Threshold selection criteria, local model selection criteria and monitoring and assessment criteria
Government-established environmental objectives (including groundwater management plans)	Formal objectives established by relevant authorities, such as environmental standards, reduction targets, or ecological goals. May incorporate or be based on models, assessments, or monitoring results.	May define thresholds, maximum allowable pressure, or basin-wide reduction requirements. Where underlying methods aren't explicit, supplementary resources may be required to link pressures to the desired state of nature (ideally based on components 1 + 2 + 3).	All local approaches (conditional)	Threshold selection criteria (and, where applicable, model/ monitoring and assessment criteria)
Required basin-wide pressure reduction	Gap between the current state of nature and the desired state of nature (threshold) based on local pressures. Local assessments, government-established environmental objectives, or local methods or tools might provide this	Represents the required reduction in pressure to achieve the desired state of nature (ideally based on components 1 + 2 + 3)	Back-calculation, government-established environmental objectives	Threshold selection criteria, local model selection criteria or monitoring and assessment criteria

	information.			
Chemical footprint tool	Tools like SBTN's Pesticide Impact Quantification (PIQ) tool which provide background data on emission fractions and impact characterization factors to approximate potential ecotoxicity impact on freshwater ecosystems based on company- or farm-specific pressures (e.g., pesticide usage and subsequent emissions).	Approximates the pressure to impact chain (components 1 + 2 + 3). Ideally, local information covering these components should be used to define the basin reduction.	Direct application, Back-calculation, Pesticide fallback approach	Chemical footprint tools criteria
Global model	Global model results provided by SBTN for surface water, and groundwater nutrients which provide the required basin-wide pressure reduction based on the current pressure-specific state of nature and desired state of nature (threshold).	Provides integrated components (1 + 2 + 3)	Global approach	Global model selection criteria

Even if no local chemical footprint tool is found, Pesticide Impact Reduction targets can be set using the PIQ tool in combination with local basin-level pressure or impact reductions based on resources described above (see back-calculation).

Table 6 provides a mapping of resource types to their roles in the framework and their applicability across approaches. Companies ***must*** ensure that selected resources collectively satisfy the three required components outlined in Section 1.1 and are combined in accordance with the allowable combinations defined above.

Req. 12—Approach selection by basin priority

> Companies ***must*** use the SBTN approach-selection decision tree in Figure 4 to determine the appropriate approach for each basin, based on the basin's Step 2 ranking and prioritization. Top-priority basins are defined in Box 1.

Task 1. Check SBTN's Target Tracker and Basin Threshold Tool (BTT)

SBTN Target Tracker

Before checking SBTN's Basin Threshold Tool (BTT), companies *should* see what previously validated targets using local approaches already exist in the basin by checking SBTN's Target Tracker.

- If other companies have already set targets for the pressure of interest in the last three (3) years, the company *must* still verify whether any newer resources are available in SBTN's BTT or whether newer versions of the underlying resources exist.
    - If there are none, the company can conclude Step 3a, document its selection in Task 3, and proceed to apply the same basin-wide reduction percentage used for those existing targets to its baseline pressure after completing Step 3b. Companies *must* also ensure that the spatial scale aligns with the spatial scale requirements in Section 3.2.1.
- If no targets have been set in the basin in the last three (3) years, the company *must* then review the BTT for appropriate local resources.

SBTN Basin Threshold Tool (BTT)

Companies *must* check the BTT for appropriate local resources.

For surface water and nutrient pressures:

- If both a local model and a local threshold are available in the BTT, companies *should* use both.
- If a local surface water model is available in the BTT and approved by the local water authority, but no threshold exists, companies *should* apply Richter's (2012) presumptive standard using an interim threshold of 80% of mean monthly natural flow.
- If a local nutrient model is available but no local threshold exists, companies *should* apply the global nutrient concentration threshold values for total nitrogen and total phosphorus, using the Redfield ratio to identify the limiting nutrient, as described in Section 3.4.1.
- If no local model or threshold is available, companies *must* refer to the results of Step 2: Interpret & Prioritize to determine how to proceed for each basin (see Box 1 on Basin Priority).
- Top-priority basins *must* proceed to stakeholder consultation prior to selecting either a local or global approach. Global approaches *may* only be selected for top-priority basins following completion of Task 2.
- For other priority basins, companies *may* apply the global approach without completing full stakeholder consultation, provided that:
    - No local resources are identified through the Basin Threshold Tool (BTT);
    - The company documents this determination in Task 3.

For pesticides: If local tools, models, or thresholds exist in the BTT, targets *should* be set using those resources. In case (single) resources are lacking, companies *must* proceed to Task 2.

For groundwater: Groundwater depletion is considered a concern in a basin where the Groundwater decline (score) layer of the SBTN State of Nature Water Layers app returns a score of 3 or higher. Where groundwater depletion is a concern and a groundwater management plan for the basin is available in the BTT, companies *must* set targets using

that plan (Req. 8—Groundwater local approaches). Where depletion is a concern, but no management plan is available, companies proceed to Task 2.

Req. 13—Resource screening

> Companies *must* check the SBTN Target Tracker and the Basin Threshold Tool (BTT) for available local resources.

Task 2. Consult with stakeholders to identify and assess local resources and the global model (where applicable)

Purpose and scope of consultation

Stakeholder consultation is a required part of approach selection for top-priority basins. Consultation *must* take place after the initial desktop research and review of the SBTN Basin Threshold Tool (BTT) in Task 1, and before the company documents its final approach selection in Task 3.

The purpose of consultation is to determine whether the proposed approach and its underlying resources are scientifically credible and appropriate for the basin context. Consultation can also help identify unsuitable approaches early and reduce the need for rework. It can further prepare companies for implementation in Step 4: Act by building shared understanding with the organizations and communities that manage or depend on the basin. In doing so, consultation strengthens the credibility, relevance, and local legitimacy of science-based targets.

The consultation process *must* address the following decision points:

- Whether relevant local resources (models, thresholds, assessments, tools, or government-established environmental objectives) exist for the basin;
- Whether identified local resources are technically credible (based on established methods, well documented, internally consistent, and suited to the scale of application; Appendix B) and contextually appropriate (ecologically and hydrologically relevant, robust in the basin context, and aligned in scale; Section 3.1.1);
- Where no appropriate local resources exist: address whether applying the SBTN-approved global approach constitutes a reasonable and sufficiently conservative proxy for basin conditions.
- For pesticides: whether a Pesticide Landscape Engagement target should be set in case pesticides used locally are not sufficiently monitored or that environmental quality standards/thresholds are not defined.

Companies *must* be able to demonstrate that stakeholder consultation was sufficient to inform each of the decision points above. This can be done by documenting who was consulted, the input received, and how that input supported or influenced the company's conclusions. Where stakeholder views differ, or information is incomplete, companies *should* record this and explain how they reached the final decision.

What stakeholders are not expected to do:

Stakeholder consultation does not require stakeholders to:

- Endorse basin-wide reduction calculations or reduction amounts;
- Validate company data inputs or allocation methods;

- Agree with the company's final numerical target values.

The company remains responsible for applying the selected approach correctly and transparently.

Note: The stakeholder consultation described in this section aims to support companies in selecting their approach. This guidance is distinct from but related to the broader stakeholder engagement process that a company *should* undertake throughout its science-based target-setting journey (Steps 1–5). A separate stakeholder engagement guidance document provides additional information on the broader SBTN stakeholder engagement process.

Who to consult and minimum stakeholder coverage

Stakeholders *should* have expertise or authority relevant to basin-level freshwater conditions. Stakeholders *may* play different roles in the consultation process depending on their mandate and expertise.

Stakeholders are expected to fall into one or more of the following categories (see Table 7). Consultation must be targeted according to stakeholder role.

Table 7: Stakeholder categories and consultation focus.

Category	Who they are	What to ask them
Authoritative	Stakeholders with formal responsibility for freshwater management, such as basin authorities, water management agencies, or government regulators	Confirmation of regulatory frameworks, basin plans, and the existence of government-established environmental objectives
Technical	Stakeholders with demonstrated basin-specific technical expertise, such as scientists, research institutions, or NGOs active in the basin	Assessment of model, threshold, or tool suitability and limitations
Contextual/rights holder	Stakeholders who can offer perspectives on governance, feasibility, or rights-related considerations, such as local communities or Indigenous Peoples	Identification of basin conditions, risks, governance considerations, and potential omissions in local understanding

Minimum consultation requirements depend on what is being assessed:

- **Local resources:** at least one authoritative or technical stakeholder with basin-relevant expertise and, where feasible, one stakeholder from a different category. This also covers local chemical footprint tools and, for pesticides, whether local monitoring and environmental quality standards or thresholds are sufficient. Input from contextual or rights-holder stakeholders complements, but does not replace, technical input.
- **Global approach in a top-priority basin:** at least three stakeholders across at least two categories, to confirm that the global model is a reasonable and sufficiently conservative proxy for basin conditions.

Companies *should* ensure that rights holders, including Indigenous Peoples and local communities, are included where relevant to the basin context.

Further guidance on stakeholder categories and roles is provided in Appendix B.

Subject-matter experts (SMEs)

SMEs provide methodological support for applying models, tools, and assumptions. They may be internal, contracted, or external. SME input does not count toward minimum stakeholder coverage Req. 16—Subject-matter expert identification.

SMEs and stakeholders serve distinct functions and are not interchangeable. An SME advises on whether a method has been applied and interpreted correctly. Stakeholders advise on whether an approach is appropriate for the basin. SME input, therefore, does not count toward the minimum stakeholder coverage set out above, and an SME cannot confirm the regulatory or governance context, local conditions, or that no superior local approach has been overlooked.

The circumstances in which SME support is required are set out in Section 3.1.1 (1a) for pesticide direct application and in Req. 11—Subject-matter expert support for back-calculation.

What to ask stakeholders

Companies *must* ensure that consultation requests clearly specify that stakeholders are being asked to assess the suitability of the approach and its underlying resources, not to validate calculations or endorse final targets.

Companies *must* structure consultation requests around decision-based questions, including:

- Is this type of approach appropriate for the basin and pressure?
- Are the underlying resources (e.g., model, threshold, or tool) suitable and ecologically relevant?
- Are any superior local approaches known?
- What limitations or risks *should* be considered?
- (For pesticides) Are concentrations of pesticides used locally sufficiently monitored, and do thresholds exist?
- **Regarding pesticides:** If at least one stakeholder states that pesticides used locally are insufficiently monitored or that environmental quality standards/thresholds are not defined, companies *must*[6] set a Pesticide Landscape Engagement target in the basin (Case 1 in Req. 5—Applicability conditions of Pesticide Landscape Engagement targets) to reduce their company-specific impact and support the initiation of local monitoring efforts.

Assessing alignment with government-established environmental objectives with stakeholders:

Where government-established environmental objectives are identified, companies should consult stakeholders on whether and how to apply them at the company level. This is

[6] Companies must set a Pesticide Landscape Engagement Target unless a target has already been set based on the five cases outlined in Req. 5. If this is the case, companies should set a Pesticide Landscape Engagement target but are not required to.

particularly important where the objectives are set at basin or system scale without specifying allocations for individual users.

Stakeholder input should support:

- Confirming that the objective is ecologically appropriate and sufficiently protective, consistent with Appendix B;
- Identifying accepted methods for translating basin-level objectives into company-level targets.

Where company-specific allocations are not defined, companies must use stakeholder input to determine whether to apply:

- A back-calculation approach;
- A direct application of available models, methods, or tools.

Assess the global approach:

Prior to consultation, companies are encouraged to review the basin-wide reduction requirements generated by any applicable SBTN-approved global model. Sharing these results gives stakeholders a concrete basis for assessing the model. Companies should ask whether the model reasonably represents basin conditions—for example, whether it reflects known hydrological, water quality, and management conditions, whether it omits anything material to the basin, and whether any local resource would represent the basin better. Companies ***should not*** ask stakeholders to confirm the reduction percentage itself.

Stakeholders do not need to assess the Pesticide Impact Quantification (PIQ) Tool. Unlike the global models for water quantity and nutrients, which provide basin-specific reduction percentages, the PIQ Tool only quantifies the company's baseline value. It does not determine the required basin-wide reduction.

Rec. 2—Practical recommendations on stakeholder engagement

To improve efficiency and reduce follow-up with stakeholders, companies are encouraged to:

- Conduct desktop research on suitable local resources that allow for a targeted outreach to stakeholders;
- (For national and international stakeholders) Identify all basins that fall within the same jurisdiction;
- Structure consultation questions around clearly defined decision points (e.g., "Is this approach suitable for this basin given the underlying resources?" rather than "Are these numbers correct?");
- Combine questions on approach suitability, basin applicability, and availability of alternatives into a single consultation exchange;
- Clearly communicate with stakeholders about the scope and limits of the input being requested.

These practices are intended to support consistent interpretation by validators and reduce ambiguity for all parties. Additional stakeholder consultation recommendations are included in Appendix C.

How to record stakeholder responses

Stakeholder consultation responses ***must*** be recorded using one of the following standardized response categories:

- Supports the proposed approach;

- Supports with conditions (with conditions clearly specified);
- Does not object to the proposed approach;
- Does not support the proposed approach (with rationale provided).

Companies *must* keep written or recorded evidence of stakeholder responses in a format that directly maps to Appendix B criteria.

Managing incomplete or differing stakeholder inputs

If Stakeholders do not respond

In some basins, stakeholders may be difficult to reach or unwilling to engage.

Outreach is considered to have failed where a company documents contact with at least two relevant stakeholder categories, providing a response period of at least eight weeks from first contact, including at least two follow-up attempts. Evidence *must* be retained in line with Req. 14—Stakeholder consultation evidence identifying the organization, role, basin, and dates of contact.

Where outreach has failed, the consultation requirement in Task 2 is deemed met. The company remains responsible for independently assessing the selected resources against Appendix B. What the company *may* then select depends on the basis of the approach:

a) *Local approach already in official use.* Where the local model, threshold, or objective is applied by a designated authority in a basin plan or regulatory instrument, or is a government-established environmental objective meeting Appendix B Section 6, the company *may* select and apply it. The instrument's status, not stakeholder confirmation, demonstrates protectiveness. The company *must* document the instrument relied on.

b) *Local approach documented but not in official use.* A company may select and apply an approach that is published, peer-reviewed, or otherwise externally documented even if it is not applied by a local authority. To do so, it must demonstrate that the approach and its underlying resources meet the applicable Appendix B criteria. It must also identify the subject-matter expert who applied and interpreted it, disclosing at validation the expert's affiliation, relevant qualifications, and any commercial relationship. A commercial relationship does not disqualify the expert, but the expert *must* not hold an interest contingent on which approach is selected, and the company remains responsible for the assessment.

c) *Local approach requiring material interpretation.* Some applications require judgment that the source does not specify—for example, selecting among monitoring data, transferring parameters from another basin, or combining resources under Appendix B Section 5. In these cases, the requirements in (b) apply. The company must also apply the more conservative of the local and global outputs.

d) *Global approach*. Companies *should* default to the applicable global model. The company *must* independently assess whether the global model is appropriate and sufficiently conservative for the basin context and provide evidence supporting this assessment.

e) *Pesticide fallback approach.* A pesticide fallback approach using the Pesticide Impact Quantification (PIQ) Tool *should* be used. Companies *must* also provide a statement, based on desktop research, on whether pesticides used locally are sufficiently monitored and whether environmental quality standards or thresholds are defined. Additionally, they *must* document existing local resources and information on pesticide pollution (See Req. 18—Documentation of local resources).

Top-priority basins

Stakeholder consultation is required before selecting an approach in top-priority basins. Consultation is completed when at least one substantive response has been received from an authoritative or technical stakeholder. Documented outreach alone is not sufficient. Where outreach has failed in a top-priority basin, the company *must* apply the global approach under (d) and *may not* select a local approach under (a) to (c). In this case, the company's documented independent assessment under (d) replaces the three-stakeholder confirmation otherwise required for the global approach

If stakeholders disagree:

Stakeholder consultation is intended to inform decision-making and does not require consensus. Where stakeholders provide differing views on the suitability of an approach, companies are expected to:

- Consider the ecological protectiveness and basin relevance of the evidence provided;
- Document the nature of the disagreement;
- Explain the rationale for the final approach selection.

Disagreement alone does not invalidate an approach, provided the selected approach remains scientifically credible and conservative for the basin.

How consultation informs approach selection

If at least one local approach is available:

If a local approach meets SBTN criteria (see Appendix B), the company *should* use it for target setting. Where multiple local approaches meet these criteria, the company *may* select any valid option and is not required to demonstrate preference or hierarchy among them.

A local approach that meets SBTN criteria and validation requirements remains an acceptable basis for target setting, even where the resulting reduction is smaller than that produced by an available global approach. Companies *should* select the approach best supported by basin-specific evidence and stakeholder consultation and then submit the resulting target for validation (see Section 3.1.3).

Stakeholder consensus is not required for approach selection. Companies *must* document stakeholder input, including differing views where relevant, and provide a clear rationale for the final selection. These records *must* be submitted as part of the validation documentation.

For pesticides, companies *should* use local approaches where available. Because applying them can require considerable expertise in water quality and ecotoxicity, the pesticide fallback approach remains acceptable.

If thresholds are already met:

A basin may already be within the relevant ecological threshold. This may be indicated by stakeholder consultation, or by the selected approach returning a required basin-wide reduction of zero or less.

Where the threshold comes from a local approach, the company *must* demonstrate, as part of the target validation submission, that the threshold is protective of nature. Where it comes from an SBTN-approved global model, no further demonstration is required.

When the company sets a target in this basin, it must either:

- set a target at its baseline level in the basin (a maintenance target); or
- set a reduction target greater than 0%.

Maintenance targets are validated science-based targets and count toward target coverage. They *must* be identified as maintenance targets in the coverage disclosure (Req. 1—Disclosure of target coverage) and in claims. In either case, the company would follow SBTN's mitigation hierarchy (Avoid, Reduce, Regenerate, Restore, Transform) when planning actions under Step 4: Act.

Additional consideration for pesticides:

For chemicals, i.e., pesticides, meeting thresholds for individual substances does not ensure that the freshwater ecosystem is protected from the combined effects of multiple chemicals. This is especially true if only a few substances are monitored. Where local approaches allow, companies *should* set targets based on mixture toxicity. Companies *may* also choose a more ambitious target, specifically in multi-stressed environments.

- If no appropriate approach is found for Freshwater Quantity or Nutrient Freshwater Quality targets in priority basins

If the company cannot identify a local approach that meets validation criteria, and stakeholder consultation does not confirm that the global model is appropriate, it *may* conclude that no appropriate approach is available and that targets cannot yet be set for the basin. It *must* submit evidence of its attempts to identify local approaches and of the stakeholders contacted (basin, organization, and title). Pesticide targets can still be set using pesticide usage data alone.

When no appropriate local or global approach exists, companies *can* choose between two options. Both options are equally valid for target setting and *may* be selected based on resource availability and interest in the basin.

1. Companies *may* fund the development of local approaches for the basin. Due to noted risks associated with company-funded research (Legg et al., 2021), companies engaging in this option will be required to:
    - Establish an independent advisory body (composed of at least five independent stakeholders with no financial or other ties to the company)
    - Verify that the local approach is:
        - Open access
        - Scientifically robust and based on best available science
        - Applied independently of company financial interests.

For the use of SBTN methods, companies *must* demonstrate, based on stakeholder input and supporting evidence, that the selected approach is appropriate for the basin and grounded in best available science. Stakeholder consultation is intended to inform this assessment and does not require consensus or formal approval. Once companies meet the safeguards, they *may* then use the approach to set science-based targets. As part of the validation process for these targets, companies will submit the approach (including verification of open access), supporting methodological documentation, and stakeholder evaluation.

2. Companies *may* defer target setting until a suitable local approach becomes available. In the meantime, they *may* use external frameworks or standards, such as contextual water targets or the Alliance for Water Stewardship (AWS) Standard. However, these targets cannot be claimed as SBTN science-based targets. When presenting information related to their target coverage, companies will indicate that this basin lacks science-based targets because adequate models are unavailable.

The company *must* consult the SBTN Basin Threshold Tool annually to see if any local resources have been added. If a valid local approach becomes available, companies *should* use it to set targets, which may then be submitted for validation.

Once validated, companies *may* make standard claims associated with setting science-based targets. Claims *must* be scoped to the pressures and basins covered (see Req. 2—Scope of claims).

Box 5: Basin monitoring

To support model assessment and ensure sufficient information for subsequent baselining and validation, we recommend companies maintain a minimum monitoring set in priority basins. At a minimum, companies *may* want to consider installing or accessing source-specific flow meters to track water withdrawals and discharges, collect routine measurements of water levels and flows (including groundwater levels at on-site wells where applicable), and gather periodic water quality data relevant to nutrient loads or other priority pollutants. Effect-based methods, e.g., bioassays (see Appendix A), *may* also be used to (continuously) monitor chemical water quality and indicate potential deterioration. Companies *may* also consider documenting any managed aquifer recharge (MAR) interactions, water treatment or reuse systems, and basin-specific infrastructure influencing flows or quality. These data will enable a more accurate evaluation of basin conditions, strengthen the selection of local or global approaches, and align monitoring practices with the forthcoming Step 5: Track measurement, reporting, and verification (MRV) requirements.

For examples of stakeholder consultation approaches and related resources, companies may refer to the SBTN resource webpage. An information sheet, response form, and checklist are provided in Appendices C.1–C.3.

Req. 14—Stakeholder consultation evidence

Companies *must* consult stakeholders with relevant basin-level technical or governance expertise. At a minimum, they *must* seek input from one authoritative or technical stakeholder and, where feasible, from one additional stakeholder in a different category.

Companies *must* submit concrete evidence of the consultation, such as email correspondence, meeting notes or minutes, or workshop records, identifying who was consulted, their role or expertise, and the basin covered.

Where stakeholders do not respond, companies *must* document their outreach as set out in Section 3.1.2. Lack of response does not prevent selection or validation of an approach, provided the company has independently assessed the selected resources against the applicable SBTN criteria and, in top-priority basins, applies the global approach.

Req. 15—Stakeholder consultation scope

Companies *must* conduct stakeholder consultations to inform the approach selection on these specific decision points:

1. Identification of local resources (including a check on sufficient monitoring and regulation for pesticides);
2. Assessment of their appropriateness;
3. Evaluation of global approaches (if applicable); and
4. Confirmation that no superior local approach has been overlooked.

Companies *must* provide sufficient documented evidence to demonstrate that the consultation adequately informed the approach-selection decision.

Req. 16—Subject-matter expert identification

Companies *must* identify any subject-matter expert (SME) who supported the application or interpretation of an approach, giving their name, affiliation, and relevant qualifications.

They *must* also disclose any commercial relationship the expert has with the company, and any involvement in developing the resource being applied. Neither a commercial relationship nor involvement in developing the resource disqualifies an SME. The company remains responsible for the resulting assessment.

The same individual *must not* be counted both as an SME and toward the minimum stakeholder coverage under Req. 14—Stakeholder consultation evidence.

3.1.3 VALIDATION CRITERIA FOR APPROACH SELECTION

Task 3. Document the approach selection for target validation

Companies *must* provide sufficient evidence that the selected approach, underlying resources, and consultation process are consistent with SBTN criteria and appropriate for the basin context.

Validation assesses whether the selected approach and supporting resources meet SBTN requirements for technical credibility, contextual appropriateness, stakeholder consultation, and documentation. It is not based on whether a local approach produces a more stringent target than an available global approach. Where a local approach satisfies SBTN requirements, the resulting target remains eligible for validation even if the required reduction is smaller than that generated by a global model.

Req. 17—Approach selection evidence

Companies *must* show that the selected approach and underlying resources meet the applicable Appendix B criteria for the basin. The submission must identify the evidence used for each criterion, any stakeholder or subject-matter expert input relied on, and the company's rationale for the final selection.

Req. 18—Documentation of local resources

If identified local resources were not considered appropriate for local approaches, they *must* still be submitted with a brief explanation. For pesticides, the relevance of the following scenarios for the respective basin, data sources, and descriptions *must* be provided:

- Pesticides used locally are not sufficiently monitored and/or environmental quality standards/thresholds are not defined.
- Threshold exceedances of pesticides used by a company are identified and/or pesticides used by a company are identified by the selected data source as the (temporary) main contributors to local mixture toxicity, basin priority pollutants, or top exceeding substances.
- Local information does not allow for back-calculation, but the basin is referred to as having a high chemical- or pesticide-related risk or impact.
- The location has high nutrient and pesticide pollution, and the local ecosystem is therefore experiencing multiple stresses.

Step 3b. Company baseline setting

3.2 Baseline values on relevant pressures

What this section produces: A baseline value for each basin and pressure, fixed during validation.

How it works: Two tasks.

1. Compile activities in the basin, at the spatial scale set in Section 3.2.1.
2. Calculate the baseline. Section 3.2.2 gives the rules that apply across all pressures; Sections 3.2.3 to 3.2.5 add what is specific to quantity, nutrients, and pesticides.

Baseline values represent the company's measured or estimated pressures within a basin. They are not the state of nature in that basin, and they are independent of the basin-wide reduction approaches used later for target setting.

The company baseline and the required basin-wide reduction percentage (Equation 2, Section 3.3.2) together determine the company's target. The form in which the target is expressed and tracked is set out in Sections 3.3-3.5.

3.2.1 SPATIAL SCALE

Most Freshwater science-based targets are set for priority sites at the basin level. The main exceptions are HHPs Cessation targets for pesticide producers and traders, which are set at company- or business-unit level, and Pesticide Landscape Engagement targets, which may be set at basin or landscape level.

River basins are defined at different levels of spatial aggregation, reflecting how tributaries combine into larger downstream systems. The Pfafstetter Coding System (see Glossary) is used throughout this method. The appropriate level varies by pressure and approach, so a company *may* use different levels for different targets, and the level *may* be finer than the one used in Steps 1 and 2.

Figure 5 shows how the same priority sites group differently depending on the Pfafstetter level applied.

Task 4. Compile company activities in the basin

Box 6: Baseline unit

> Baselines are built from the production units and sourcing locations identified in Step 1b. For direct operations this is the production unit—any geographically defined area under the company's operational control, including non-industrial sites such as offices where they withdraw water, load nutrients, or release pesticides in the basin. For upstream activities it is the sourcing location where known, or the supply shed associated with a collection point or primary processing site where individual producers cannot be identified.
>
> Baseline values are established, and targets set and achieved, at basin level. Baseline units are the inputs used to build the basin baseline.

Once the basin level is set, companies group the baseline units by basin, so targets cover all relevant activities. In many cases this compilation already exists from Step 1b, Tasks 8 and 10, which group activities by basin at Level 5 for quantity and Level 6 for quality; Task 4 confirms if it matches the scale selected here.

For pesticides, secondary usage data may only exist at national or regional scale. Companies still set targets at the basin level and disclose the scale of the underlying data.

Local approach

There is no prescribed basin level under the local approach. Companies choose a boundary based on the scale of available local models, monitoring data, governance units, and basin conditions, subject to the requirements below.

Beyond those requirements, companies ***should*** also consider whether the boundary:

- Aligns with relevant hydrological, management, or governance boundaries; and whether
- It reflects available stakeholder input.

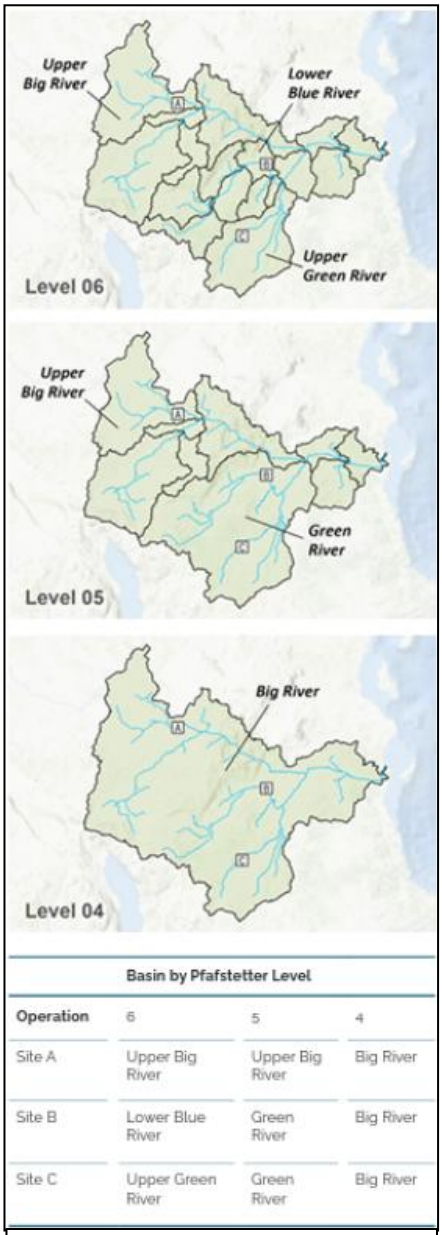
Validators assess whether the boundary is reasonable, scientifically justified, and transparent. Companies are not expected to demonstrate impacts at a finer resolution than their data supports.

Req. 19—Justifying a non-standard boundary

> Where the selected boundary is not based on a standard basin or governance unit, companies ***must*** provide a brief justification and explain any known limitations or uncertainties associated with the chosen boundary.

Spatial resolution finer than the Step 2 basin

A local resource may operate at a finer resolution than the basin selected in Step 2. For example, Step 2 defines the basin at Level 5 while the local resource is built at Level 7. Working at the finer resolution is permitted. Full coverage of company activities in the Step 2 basin remains the default: where a local resource covers only part of the basin, the remainder is covered by the global approach or by other local resources stitched together with it. Where a company can demonstrate that the global approach is not appropriate for the remainder, it may instead set a target covering only the part for which acceptable local resources exist. The requirements below set out both routes and the conditions attaching to partial coverage.



Basin by Pfafstetter Level			
Operation	6	5	4
Site A	Upper Big River	Upper Big River	Big River
Site B	Lower Blue River	Green River	Big River
Site C	Upper Green River	Green River	Big River

Figure 5: Compiling priority sites by basin at different Pfafstetter levels. Hydrological basins should be aggregated to the correct level, depending on the target-setting process described in this guidance document. The figure shows the relationship between different levels, where the larger basins (e.g., Level 4) contain the smaller basins (e.g., Level 5 or 6).

Combined resources

A company may combine resources of different types to derive the required basin-wide reduction—a local basin baseline with a default threshold, for example. It must apply each resource at its own spatial delineation and document the combination. Criteria for combining resources are in Appendix B.

Pesticide fallback approach

For Pesticide Freshwater Quality targets set with the fallback approach, the spatial scale follows the company's Freshwater Nutrient Quality or Quantity target where one exists. If not then use Pfafstetter Level 6.

Req. 20—Spatial scale and approach alignment

Before calculating baseline values, companies *must* define the spatial scale for each Freshwater target. The spatial scale must be consistent with the approach selection in Section 3.1.

For global approaches, companies *must* use the spatial scale prescribed by the applicable model:

- Freshwater Quantity: Pfafstetter Level 5;
- Nutrient Freshwater Quality: Pfafstetter Level 6; and
- Pesticide fallback approach: the same spatial scale used for the company's Freshwater Nutrient Quality or Quantity target where applicable; otherwise Pfafstetter Level 6.

For local approaches, companies *must* define the spatial scale based on the scale of the local resources used. The selected boundary *must*:

- Capture the main upstream contributing areas and downstream impacts associated with the company's activities; and
- Be consistent with the spatial scale of the models, assessments, or monitoring data used.

A local resource may be defined on a management or hydrogeological unit rather than a Pfafstetter basin—an aquifer boundary or a statutory management area, for example. Companies may use that unit, provided they map it to the Pfafstetter basin used for reporting and disclose the mapping.

Req. 21—Coverage of company activities

Companies must compile all baseline units within the selected spatial scale that contribute to the pressure in scope, including certified sourcing (see *Use of certification and production standards* in Section 3.2.2).

A target *must* include all of the company's activities contributing to that pressure within the spatial scale at which the target is set. Targets covering only some of those activities — for example a program area or a selected group of suppliers — are not permitted. Companies may pursue actions in such areas under Step 4.

Where targets are set at a finer resolution than the Step 2 basin, companies *must* set a target for every finer-resolution basin in which they have activities, unless partial coverage is permitted under Req. 22—Covering the basin with local and global resources. Companies *must* in all cases submit baseline values for all their activities in the Step 2 basin, whether or not those activities fall within a target.

Where activities are excluded because they fall outside the traceability requirements, companies must disclose the excluded share by area, volume, or tonnage, together with the reason for exclusion.

Units under organic or other certified production must be included in the baseline. They may be recorded as zero for a given pressure only where the company can show that pressure is genuinely absent.

Req. 22—Covering the basin with local and global resources

Where a local resource operates at a finer spatial resolution than the Step 2 basin, companies *must* calculate the required reduction separately for each relevant finer-resolution basin.

Where a local resource covers only part of the Step 2 basin, companies *must* either:

1. Apply the local reduction to activities within the area covered by the local resource, and the global reduction to activities in the remainder of the basin; or
2. Apply the global reduction across the entire Step 2 basin, provided this is at least as stringent as option 1.

A Step 2 basin may be covered by more than one local resource. Where several local resources cover different parts of the basin, companies must apply each to the area it covers, and treat any remaining area under option 1 or 2 above. Where two local resources cover the same area, the most stringent applicable reduction applies (see Req. 23—Combining spatially different or overlapping resources).

Companies *must* use every acceptable local resource covering part of the basin. Where a company identifies a local resource and does not use it, it *must* state why the resource was not considered appropriate under Appendix B.

Applying the global approach to the remainder of a basin does not require a further stakeholder consultation under Task 2, since consultation for that basin has already established that no suitable local resource covers it.

For Pesticide Freshwater Quality targets, where no global approach is available, the pesticide fallback approach applies to the remainder.

Companies *must* disclose how the basin was covered—including which resources applied to which area, the share of the basin baseline covered by each, and the rationale.

At each recalculation, companies *must* check whether an acceptable local resource has become available for any part of the basin not already covered by one and apply it where it has. Where an available resource is not applied, companies must state why.

Partial coverage

Where a company demonstrates that the global approach is not appropriate for the remainder of the basin, it may set a target covering only the area for which acceptable local resources exist. In top-priority basins, this demonstration *must* be supported by stakeholder consultation under Task 2. In all other basins, the company documents the demonstration and the validator assesses it.

Where partial coverage is applied, all the following apply:

- Progress is assessed only against activities within the covered area. Reductions outside the covered area do not count towards the target and increases outside it do not count against it.
- The target *must* name the hydrological units it covers. It *must not* be stated as a target for the Step 2 basin.
- Companies *must* submit baseline values for all their activities in the Step 2 basin, including activities outside the target, and *must* report coverage as the share of the company's pressure in the Step 2 basin that the target covers.

Req. 23—Combining spatially different or overlapping resources

Where multiple resources are used to determine the required basin-wide reduction, companies *must* align their calculations with each resource's spatial delineation and *must* document how they combine the resulting values.

Where multiple valid local resources cover the same area, the most stringent applicable reduction applies. Where resources cover different areas, each area *must* be treated according to the applicable spatial-scale requirements.

3.2.2 BASELINE HIERARCHY AND REQUIREMENTS (APPLIES ACROSS ALL PRESSURES)

Box 7: Definitions used in this section.

Baseline unit. See Box 6 (Section 3.2.1).

Activity data and pressure data. Each baseline value combines two inputs: ***activity data***, the volume or extent of the company's activity, and ***pressure data***, the freshwater pressure associated with it. The two often differ in resolution or reliability and may relate to different years. Pressure data may be measured, estimated, or derived from a pressure factor, such as a regional water footprint per metric ton.

Qualifying year. A calendar or reporting year in which a baseline unit has complete activity data and applicable pressure data, meeting Req. 28—Completeness of qualifying years. The pressure data *may* be measured, estimated, or derived from a pressure factor. "Qualifying" means complete, not high quality. The pressure data need not be measured: a year with complete procurement data and a static national factor still qualifies. Data quality is captured by the tier, not by whether a year qualifies.

Year-specific and unit-specific pressure data. Pressure data are year-specific where they change from year to year to reflect conditions in that year; a fixed factor applied unchanged across years is not. They are unit-specific where they are measured or estimated for that baseline unit rather than taken from regional or national factors. Together with the number of qualifying years, these determine the unit's tier (see below).

Baseline period. The five-year window ending with the most recent qualifying year at the time of submission. The baseline period is fixed at validation and is always five years. It does not contract to the span of the available data A unit *may* have qualifying years for only part of it, and the number of qualifying years determines its tier.

Baseline value. For a unit, the average pressure across qualifying years within the baseline period. Where pressure is expressed per hectare or per metric ton, the average is weighted by that unit's activity in each year.

How tiers are assigned

Tiers are assigned per baseline unit, across two dimensions, and the unit takes the lower of the two results (see Table 8).

Table 8: Baseline tiers

	Qualifying data	Pressure data
Tier 1—Full historical baseline	Five years	Year-specific and unit-specific
Tier 2—Shortened historical baseline	Three or four years	Year-specific, unit-specific, or derived from representative units
Tier 3—Modeled or proxy baseline	Fewer than three years	Not year-specific, or not unit-specific (regional or national factors, modeled estimates)
Tier 4—Provisional baseline	None	No unit-level or region-specific data; sector average data only

All four tiers can support a validated target. Tier 1 is the default. Tier 3 is the expected case for upstream sourcing, where companies hold reliable volume or area data but cannot obtain year-specific pressure data from individual producers. It is not a deficiency in itself and, unlike Tier 4, may be used without a time limit.

Box 8: Worked example—assigning tiers.

Three baseline units in one basin, with a 2021–2025 baseline period:

Unit	Data held	Qualifying years	Pressure data	Tier
A: direct operations site	Monthly water meter readings, 2021–2025	5	Year-specific and unit-specific	Tier 1
B: supplier farm	Farm records of fertilizer use and yield, 2022–2025	4	Year-specific and unit-specific	Tier 2 (set by years)
C: supply shed	Kilograms procured, 2021–2025, with a national nitrogen loss factor from 2017	5	Static national factor: neither year- nor unit-specific	Tier 3 (set by pressure data)

Unit C shows why "qualifying" does not mean high quality. All five years qualify because the activity data are complete and a factor applies, but the static factor limits the unit to Tier 3. Each unit takes the lower of its two results.

Req. 24—Accuracy of estimated baselines

> Estimated baselines must represent the company's actual pressure as accurately as the available data allow.

Use of certification and production standards

Certification or production standard information may be used to refine pressure data. For example, by removing inputs or practices the standard prohibits from a regional or national profile. Or by replacing regional estimates with usage data collected by the scheme. Any refinement must be documented against the published standard or dataset.

Refinement of this kind does not make the data unit-specific or year-specific. Tier 3 covers pressure data that is not year-specific or not unit-specific, so a certification-adjusted regional or national profile remains Tier 3.

Representativeness and disclosure of baseline years

The baseline period includes every qualifying year. Representativeness is demonstrated through disclosure, not by excluding years.

This differs from the treatment of atypical years in Step 1, which concerns procurement volumes for materiality screening rather than pressure. For a freshwater baseline, variability in hydrological and climatic conditions is material to the pressure being measured, which is why the exclusions below are narrower.

Req. 25—Representativeness of baseline years

> Companies may exclude years affected by non-recurring operational events—site shutdown, fire, force majeure closure—with documented justification. Years affected by hydrological or climatic conditions, such as drought or flood, *must not* be excluded. Where a documented crop rotation cycle is longer than the number of qualifying years, companies must disclose this and state how the baseline accounts for it. This applies only to field or farm baseline units with crop-level data, not to baselines derived from procurement volumes for a supply shed.

Estimating missing data

Within a year. Where a year meets the minimum completeness in Req. 28—Completeness of qualifying years, the remaining months or periods *may* be estimated and the year counts as a qualifying year, with the method and affected periods disclosed. Where a year falls below minimum completeness, it is not a qualifying year and *must not* be scaled up.

Across years. Where a year in the baseline period is not a qualifying year for a unit, the company *may* estimate it from qualifying years using an activity driver (see box below).

Estimating pressures in missing years

A missing year can be estimated by scaling the pressure in a qualifying year by the change in an activity driver between the two years:

$$\text{Estimated pressure in the missing year} = \text{Pressure in the qualifying year} \times \frac{\text{Activity driver in the missing year}}{\text{Activity driver in the qualifying year}}$$

Example: A field unit lost 1,200 kg N in 2024, a qualifying year, from 400 ha of maize. In 2022, a missing year, the same unit grew 500 ha of maize. The estimated loss for 2022

is 1,200 × (500 ÷ 400) = 1,500 kg N.

The method assumes the pressure changes in proportion to the driver. Req. 26—Estimating and extrapolating data sets out the evidence required for that relationship.

This is optional. A company *may* instead use only its qualifying years, which sets its tier accordingly. Typical activity drivers are yield and crop production area by crop for nutrient loss and pesticide use from cultivated land; kilograms procured for supply sheds; and production volume or operating hours for direct operations.

Req. 26—Estimating and extrapolating data

> Where a year falls below the minimum completeness in Req. 28—Completeness of qualifying years, it is not a qualifying year and *must not* be scaled up to represent a full year.
>
> Where a company applies measured values from one baseline unit to another, the units *must* share the same commodity or crop, production system, and sub-region. Extrapolation across commodities is not permitted. Companies *must* state why the source is representative of the unit to which its values are applied. Units estimated this way are at most Tier 2.
>
> To estimate a unit's pressure for a missing year using data from another year, companies *must* state the activity driver used and provide evidence of its relationship to the pressure. That evidence *must* come from two or more years of paired data, or from a documented technical coefficient.

Proxy pressure metrics and measurement points

Where no established method exists to quantify a pressure directly, a proxy metric may be used—for example, a nutrient surplus instead of measured leaching, or a gray water footprint in place of nutrient load. Where a pressure can be quantified at more than one point in its pathway, such as the root zone, the first receiving water body, or the coast, the company selects one.

A proxy metric does not by itself determine the tier. The tier depends on whether the underlying data are year-specific and unit-specific.

Req. 27—Consistency of metric and scope

> Companies using a proxy metric, or choosing a measurement point, *must* state which metric or point they selected and apply it to the baseline and to every reporting year. If the target is derived from a local threshold, they *must* also state how the metric relates to that threshold.
>
> Companies *must* state whether the baseline covers the whole baseline unit or only the share attributable to the company, apply that choice consistently, and disclose any activity excluded together with its estimated share of the unit's pressure.
>
> Baselines expressed in different metrics *must not* be summed. For nutrients, nutrient loads and gray water footprints *must* be reported and aggregated separately.

Attribution of a unit's pressure to the company's share: see *Allocation* in Chapter 3 of the SBTN AGILE guidance.

Aggregating baseline units in a basin

Req. 30—Aggregation and coverage sets out the calculation. Box 9 shows it step by step.

Where a company holds data for only some units in a basin, the reported company baseline *must* still represent its total pressure there. The remaining pressure is estimated from the reporting units, stratified by characteristics that affect pressure.

Box 9: Worked example—building a company baseline.

A company has four baseline units in one basin, a nutrient baseline, and a 2021–2025 baseline period. Unit 4 has been in the company's value chain throughout 2021–2025, but sourced nothing from it in 2021, 2022, or 2023. All values are in kg N per year.

Baseline unit	2021	2022	2023	2024	2025	Unit baseline value
Unit 1	not qualifying	not qualifying	3	2	7	4.00
Unit 2	not qualifying	not qualifying	3	1	4	2.67
Unit 3	24	5	2	56	66	30.60
Unit 4	0	0	0	not qualifying	3	0.75

Each unit is averaged across its qualifying years. The company baseline is the sum of those unit values: 4.00 + 2.67 + 30.60 + 0.75 = **38.02**.

Two points the example illustrates:

- Unit 4's zeros are years in which it was in the value chain but had no activity. They count toward its average, which is why its baseline value is 0.75 and not 3.
- Averaging each unit before summing means a unit's non-qualifying years are represented by that unit's own average, not by zero. Summing each year first would treat a missing year as no pressure and understate the company's baseline, giving 35.20 instead of 38.02.
- By contrast, a unit that joined the value chain only in 2024 would have no entries for 2021–2023, and its baseline value would be the average of its qualifying years alone.

Which years the baseline covers

The baseline period is fixed at validation: data from years after the baseline period must not be used to establish a new baseline (Req. 31—Baseline recalculation). Those later years are reporting years and may already reflect reductions the company has achieved. Better data for them enters through recalculation instead.

Where a Tier 3 or Tier 4 baseline is later replaced by a higher-tier baseline, the original baseline period is recalculated using the improved data, back-cast with a documented activity driver. Because improved measurements may already reflect reductions made since

the baseline period began, recalculation can restore the baseline to what it would have been without those measures (Req. 31—Baseline recalculation).

The recalculated method applies to the subsequent reporting years. Where earlier reporting years cannot be restated on the same basis, companies must disclose the break in the series. Companies are not expected to revert to weaker data for the sake of consistency.

Reporting the baseline and tracking progress

The baseline is cited as the average across the baseline period, stated with the years used—for example, "2021–2025 average." Progress is assessed by comparing the company's pressure in the most recent complete reporting year against its target, calculated on the same basis as the baseline. Where a moving average is used at the target date, it must cover the same number of years as the baseline period, and companies must disclose the years used.

Req. 28—Completeness of qualifying years

Activity data *must* cover the full year and the whole unit: production volume, throughput, or operating data for direct operations; procured volume, or crop production area by crop, for upstream.

Pressure data, where measured or estimated for the unit in that year, *must* meet the following minimum completeness:

- Freshwater quantity: at least 10 of 12 months, measured or estimated;
- Nutrients, point sources: at least four sampling events across the year, each paired with discharge flow data, including at least one during the period of expected peak concentration or discharge;
- Nutrients, nonpoint sources: full-year coverage, measured or estimated;
- Pesticides: all applications in the year, including pre-planting applications if applicable (see the PIQ Tool Manual).

Where a pressure factor is used instead, the requirements above do not apply. The factor *must* be applicable to the unit's commodity or crop, production system, and region, and companies *must* disclose its source, version, and the year(s) it represents.

Estimated pressure data qualify only where they represent pressure that actually occurred. Estimates derived from recommended practices, such as label application rates or scheme-recommended dosages, do not qualify.

Companies *must* include all qualifying years in the baseline. Years affected by non-recurring operational events may be excluded with documented justification. Years affected by hydrological or climatic conditions *must not* be excluded.

Req. 29—Tier assignment and disclosure

Companies *must* use the highest tier reachable for each baseline unit, and *must* state the tier applied and, where it is not Tier 1, why a higher tier was not reachable.

Companies *must* report a **tier profile** with each basin-level target: the share of the company baseline held at each tier, by volume, load, or area. Tiers are ordinal categories and *must not* be averaged into a single figure. The basin tier profile is a disclosure requirement and does not split the target.

All four tiers can support a validated target. A Tier 3 baseline does not expire and does not require a later change of tier.

Tier 4 baselines *may* be used for a maximum of three years from validation. Companies *must* transition to Tier 3 or higher within that period where reachable. Where not, the Tier 4 requirements continue to apply and *must* be disclosed in each progress report.

Req. 30—Aggregation and coverage

All baseline units contributing to a basin-level target must use the same baseline period.

The company baseline *must* be calculated as the sum of each unit's baseline values, each the average of that unit's pressure across its qualifying years.

A year in which a unit was in the value chain but had no activity or pressure must be entered as zero and counts toward that unit's average. A year for which data are missing must be excluded from the average and does not count as a qualifying year. Years before a unit joined the value chain, or after it left, *must not* be entered.

Coverage *must* be disclosed for each baseline year as a share of area, volume, or tonnage. Coverage expressed as a share of the number of units is not sufficient.

Where a company scales a pressure rate to its total activity in the basin, it *must* use the activity in the most recent complete year of the baseline period, regardless of whether its activity has grown or contracted. The extent year is fixed at validation and must not be changed.

Req. 31—Baseline recalculation

The baseline period is fixed at validation and *must not* move. Companies *may* add qualifying years within the fixed period. Data from years after the baseline period *must not* be used to establish a new baseline.

Where a baseline is recalculated using measurements taken after a pressure-reduction measure was implemented, those measurements already reflect the improvement. Companies may restore the baseline to what it would have been without the measure, using the measure's documented effect scaled to baseline-period activity. This prevents a company from being required to deliver the same reduction twice. It does not credit post-baseline progress toward the target.

For example, a site metered at 800 ML in 2029 with a documented 90 ML annual saving from a 2027 retrofit would restate its baseline at 890 ML, not 800 ML.

Where documented evidence cannot quantify the effect, no restoration is made, and the baseline stands as originally estimated.

Companies *must* recalculate the baseline where any of the following occur:

- Transition from a Tier 3 or Tier 4 baseline to a higher tier;
- Addition of qualifying years within the fixed baseline period;
- Revision of an externally provided value used to construct the baseline, such as a regulatory quota, a national dataset, a published pressure factor, or a change in how a local authority measures or reports a pressure;
- Correction of an error, or of several cumulative errors that are collectively

significant;
- Change in basin delineation or in the spatial resolution of the approach applied; or
- Publication of a new version of the Step 3: Freshwater Technical Guidance, or of a tool it relies on, in line with SBTN claims guidance

Recalculation is not triggered by changes in performance, weather, or production volume, or by units entering or leaving the value chain. A change in the company's pressure in a basin affects progress against the target, not the baseline.
Unlike the Step 3: Land Technical Guidance, structural change is not a recalculation trigger for freshwater. Because Freshwater targets are absolute and basin-specific, a change in the units contributing to a basin changes the company's pressure and therefore its progress against the target, not the baseline used to measure progress.

Where a trigger occurs, companies *must* recalculate. The size of the change determines what follows:

- **Less than 5%** change in the company baseline: disclosure at the next progress report;
- **5% to 10%**: restate the affected figures in the target language and notify SBTN at the next progress report;
- **More than 10%**: resubmit the target for validation.

Where several triggers each fall below 5%, they may be tracked cumulatively and recalculated once the cumulative effect reaches 5%.

Req. 32—Data disaggregation

Primary data (direct measurement) and secondary data (modeled estimates) *must* be reported separately, as *must* direct operations and upstream activities. For pesticides, usage *must* be reported separately by data representation level (see PIQ Tool Manual) and by direct operations and upstream activities.

These are reporting requirements. They do not split the target: one target is set per pressure per basin, with the relevant shares disclosed within it.

Shares are calculated from unit-level quantities, not by year, and disclosed at basin level with the target. For pesticides, that is a proportion of kilograms of active ingredient or treated area across the years in that unit's baseline value; for other pressures, by volume or load on the same basis.

Req. 33—Documentation of methodology and data processing

Companies *must* document and submit the methodology, data sources, assumptions, data gaps, and processing steps used to build the baseline (see PIQ Tool Manual for additional pesticide-specific requirements), including:

- Baseline period and, for each baseline unit, its annual pressure value for each qualifying year;
- Unit inventory and scope, including exclusions;
- Tier assigned to each unit, with justification where below Tier 1;
- Where a higher tier is not reachable, the reason and the steps being taken to improve representativeness;

- Basin tier profile(see Req. 29—Tier assignment and disclosure);
- For each unit: data sources, methods, assumptions, certification adjustments, or proxy metrics used;
- Disclosure of non-representative or unusual years;
- Calculation showing how unit values were aggregated into the basin baseline;
- A data-improvement plan where Tier 3 and Tier 4 together exceed half the company baseline and a higher tier is reachable.

Rec. 3—Improving the baseline within the fixed period

Companies should prioritize improving how pressure data are collected for current and future years. This includes establishing systems to record data at baseline unit level, rather than retrospectively collecting additional historical years.

Where historical data for years within the fixed baseline period become available without disproportionate effort, companies should add them, as this is how a Tier 3 or Tier 4 baseline reaches a higher tier.

Req. 34—Cross-cutting guardrails

The baseline period must end no more than two years before submission.

Basin state-of-nature baseline

Requirements for the period, observation adequacy, and combination of monitoring data used to establish the state of nature in a basin are set out in Appendix B (Monitoring data and assessments criteria).

Rec. 4—Aligning the state-of-nature and company baseline periods

The period used for the basin state-of-nature baseline *should* align with the company baseline period where possible. An extended period is needed for freshwater quantity to capture interannual variability in precipitation. A local resource *should not* be set aside solely because its years do not match the company baseline period.

Where the periods differ, companies *should* state both. Companies should note the difference as a limitation, and revisit it at the next recalculation, if it is likely to affect the required reduction. This applies, for example, when the monitoring period predates a significant change in basin conditions or in the company's own operations.

3.2.3 FRESHWATER QUANTITY BASELINE VALUE

Task 5. Calculate baselines

Once the spatial scale is defined, companies calculate the freshwater quantity baseline for each basin: the total water pressure from all relevant activities within that basin.

The baseline *may* be expressed as withdrawals or as consumption. Withdrawals are the default for direct operations. Rainwater harvesting is not counted as a freshwater withdrawal for baseline purposes unless it materially affects basin availability.

Consumption *may* be reported where measured return flows are deducted from measured withdrawals and the conditions in Req. 36 (Treatment of return flows) are met. Where consumption is estimated directly using an established method, such as blue water footprint accounting, those conditions do not apply, because return flows are already accounted for in the method.

Sites certified to the AWS Standard already meter and document their annual and monthly site water balance (AWS, 2026). These records can support a direct operations baseline. AWS defines consumption as withdrawals minus discharges. Companies *may* use this value only where the return flow conditions below are met.

Req. 35—Baseline calculation and metric

Companies *must* calculate a freshwater quantity baseline representing the total water pressure from all relevant activities within the selected spatial scale, expressed as either water withdrawals or water consumption.

Companies *must* state which metric is used for each baseline unit. The metric used for the baseline *must* also be used for the target and for comparison against the basin threshold. Baselines expressed as withdrawals and those expressed as consumption *must not* be summed.

Req. 36—Treatment of return flows

Return flows *may* be deducted from withdrawals, with the result reported as consumption, only where all the following are met and evidenced:

- The return flow re-enters the same basin at the spatial scale used for the baseline;
- The return flow occurs within the same temporal unit used for reporting (monthly where available, otherwise annually), and does not shift water use from a period of higher scarcity to one of lower scarcity;
- The return flow does not degrade water quality relative to the receiving water body, evidenced by discharge monitoring or permit compliance data; and
- The same treatment is applied consistently across all baseline years and in subsequent progress reporting.

For groundwater, return flows *may* be deducted only where all of the following also apply:

- The water is reinjected into the same aquifer;
- The lag between withdrawal and return does not exceed one year, unless the company justifies a longer period;
- The return does not negatively affect groundwater quality.

Where these conditions are not met, companies *must* report withdrawals. Where return flows are deducted, companies *must* disclose the volume deducted.

Req. 37—Water source classification

Companies *must* identify whether withdrawals originate from surface water or companies *must* report the share of baseline withdrawals from each source. This informs the reduction selected in Section 3.3.1 (Req. 52—Combining pathways and sources).

Req. 38—Baseline hierarchy

Companies *must* calculate baseline values consistent with the applicable baseline tier defined in Section 3.2.2. For direct operations, the baseline *must* be based on primary data (metering) for all units in scope. For upstream activities, primary data should be used where available. Otherwise, secondary data may be used in accordance with Section 3.2.2.

Rec. 5—Temporal resolution of upstream freshwater quantity data

Where upstream freshwater quantity baselines use secondary data, such as blue water footprints or modelled crop water use, these data should be monthly wherever possible, recognizing that some sources provide only annual values. An annual baseline requires an annual target (Req. 54—Freshwater Quantity time step), which cannot reflect seasonal differences in required reductions.

3.2.4 NUTRIENT FRESHWATER QUALITY BASELINE VALUE

Following the process in Section 3.2.3, companies calculate the nutrient baseline for each basin. Data requirements depend on whether nutrient pollution originates from point or nonpoint sources.

Point sources—discharge pipes and similar—are quantified using primary data on flow and concentration. Loads are summed across all units in the basin and expressed as mass of nutrient per time.

Nonpoint sources—diffuse agricultural runoff and similar—*may* be estimated using secondary data, including modeled nutrient loads or gray water footprint approaches. Companies *may* use the secondary sources applied in Steps 1 and 2, including Environmentally Extended Input-Output (EEIO) models, life cycle impact assessment methods, and life cycle inventory databases. There is no single required method, and approaches *may* be combined.

Indirect point sources, where a company's load is routed to a non-company wastewater treatment plant before discharge, are treated in accordance with the applicable local approach.

Req. 39—Baseline calculation and metric

Companies *must* calculate a nutrient baseline representing the total present-day nutrient pressure from all relevant direct operations and upstream activities within the selected spatial scale.

Nutrient loading and gray water footprint are separate metrics and *must* be reported separately for baselining and target setting. Loads *must* be expressed as mass of N or P per time. Gray water footprints *must* be expressed as water volume per time.

Rec. 6—Temporal resolution of gray water footprints

Where pressure is measured using gray water footprints, these data should be recorded monthly wherever possible, recognizing that secondary data sources may provide only annual values.

Req. 40—Data requirements

Point source discharges *must* be based on primary data on flow and concentration for all units in scope.

Secondary data *may* be used for nonpoint sources. Data from representative units *may* be used, provided the company demonstrates representativeness in accordance with Section 3.2.2.

Req. 41—Baseline hierarchy

Companies *must* calculate baseline values consistent with the applicable baseline tier

defined in Section 3.2.2.

3.2.5 PESTICIDE FRESHWATER QUALITY BASELINE VALUE

Pesticide Freshwater Quality targets require baseline information on the pesticides a company produces, trades, or uses. Unlike the other pressures, two baselines are used:

- *Pesticide Impact Reduction baseline:* the company's total potential ecotoxicity impact on freshwater associated with pesticide use within the selected spatial scale. It is expressed as potential ecotoxicity impact calculated with the chemical footprint tool selected in Step 3a (for the PIQ Tool, in CTUe/year). This is the reference against which the required reduction in potential ecotoxicity impact is applied.
- *HHPs Cessation baseline:* the HHPs within the company's target scope and the extent to which they are produced, traded, or used. This identifies which HHPs *must* be phased out.

For companies with pesticide usage in their value chain, the same pesticide-use data forms the basis for both targets. When using SBTN's Pesticide Impact Quantification (PIQ) Tool, both baselines will be provided as an output.

For pesticide producers and traders: only the HHPs Cessation baseline needs to be calculated.

Companies with pesticide usage in their value chain

Once the spatial scale is defined, companies can calculate their pesticide-related freshwater quality baseline value. Collecting data on nutrient load is the only step required to calculate the nutrient Freshwater Quality baseline. However, when it comes to setting pesticide targets, companies with pesticide usage in their value chain must:

1. Collect pesticide usage data across all baseline units within the spatial scale and baseline period;
2. Identify whether there is definitive or likely use of HHPs and pesticides listed as banned by the Pesticide Action Network (PAN)—See Box 10;
3. Apply the chemical footprint tool selected in Step 3a to convert pesticide usage into potential ecotoxicity impact (for an explanation of why this step is necessary, see Box 2).

1. Collecting information on pesticide usage, and additional data required for quantifying a company-specific potential ecotoxicity impact

Before collecting or refining data, companies *should* review the input requirements of the chemical footprint tool selected in Step 3a. Data requirements can vary, with some tools requiring more detailed inputs to refine estimates of a company's specific potential impact. Companies selecting the local approach with direct application may need to align their assessment of pesticide usage and potential impact with a local framework, including its tools, methods, and data.

Req. 42—Pesticide usage baseline reporting

> Companies must collect pesticide usage across all baseline units within the defined spatial scale and baseline period, reported per active ingredient[7].

[7] This is required to be combined with emission fractions and pesticide-specific impact characterization factors from a chemical footprint tool, even if results are ultimately aggregated.

Minimum input data requirements of the selected chemical footprint tool *must* be met. The main input for the PIQ Tool is the total annual pesticide usage (kg/yr) per baseline unit, for each qualifying year (see Section 3.2.2).

Requirements on pesticide usage data in the PIQ Tool Manual apply independent of the chemical footprint tool used.

Companies are required to provide primary data on pesticide usage for their direct operations but may use secondary data for their value chain. Because pesticide freshwater impacts depend heavily on the specific pesticides used, companies are encouraged to use primary data where possible.

2. Identification of HHPs and pesticides listed by PAN as banned

To understand which pesticides require a cessation target, companies *must* or *should* be included in an HHPs Cessation target, companies *must* identify HHPs and pesticides listed by PAN as banned in any region. Further information on HHPs can be found in Box 10.

Box 10: Information on HHPs.

In 2014, the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) published the fourth version of the *International Code of Conduct on Pesticide Management*. Therein, HHPs are defined as:

"Pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous."

The FAO/WHO Guidelines on Highly Hazardous Pesticides [2016] define eight criteria, which cover pesticides that meet specific criteria outlined by the WHO Recommended Classification or the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) or are listed in international conventions (e.g., Stockholm Convention, Rotterdam Convention, or Montreal Protocol). However, Criterion 8 of the FAO/WHO criteria, which identifies pesticides with a high incidence of adverse effects, is dependent on the interpretation and assessment of local authorities.

The Pesticide Action Network (PAN) International List of Highly Hazardous Pesticides [2024] identifies HHPs as defined by international bodies (WHO); the European Union (EU Commission); national agencies (e.g., the United States Environmental Protection Agency [US EPA] or the National Institute of Technology and Evaluation [NITE] Japan); and the Pesticide Properties Database (PPDB), building upon the FAO/WHO criteria. SBTN refers to the *PAN International List of HHPs* as a primary reference for HHPs.

Req. 43—HHPs and banned pesticides reporting

Companies *must* provide a list of their pesticide usage in the value chain, including usage estimated from secondary data in accordance with Section 3.2.2, with one pesticide per row, as the sum across baseline units of each unit's average across qualifying years in the baseline period. They *must* show a mapping of those pesticides with the most recent PAN HHPs and consolidated bans lists (status 2026: PAN International List of HHPs [2024] and PAN Consolidated List of Banned Pesticides

[2024]). If companies choose to set an HHPs Cessation target with limited data availability, they may also quantify a baseline and set a target based on the estimated number of HHPs in their value chain.

The Pesticide Impact Quantification (PIQ) Tool may be used to support this screening if the most recent list is already implemented.

Companies *must* indicate which pesticides will be included in the HHPs Cessation target. Pesticides on the HHPs list *must* be included, and pesticides on the consolidated bans list should be included. Req. 68—HHPs Temporary Exemption outlines possible temporary exemptions.

3. Application of the selected chemical footprint tool

As a final step for Step 3b, pesticide usage is translated into potential impact using the tool chosen in Step 3a. An overview is provided in Figure 6.

Local models and assessments may already provide potential impact based on local pesticide usage. Where a company-specific contribution can be extracted from them, and the chemical footprint tool criteria in Appendix B are met, the result may be used as a baseline.

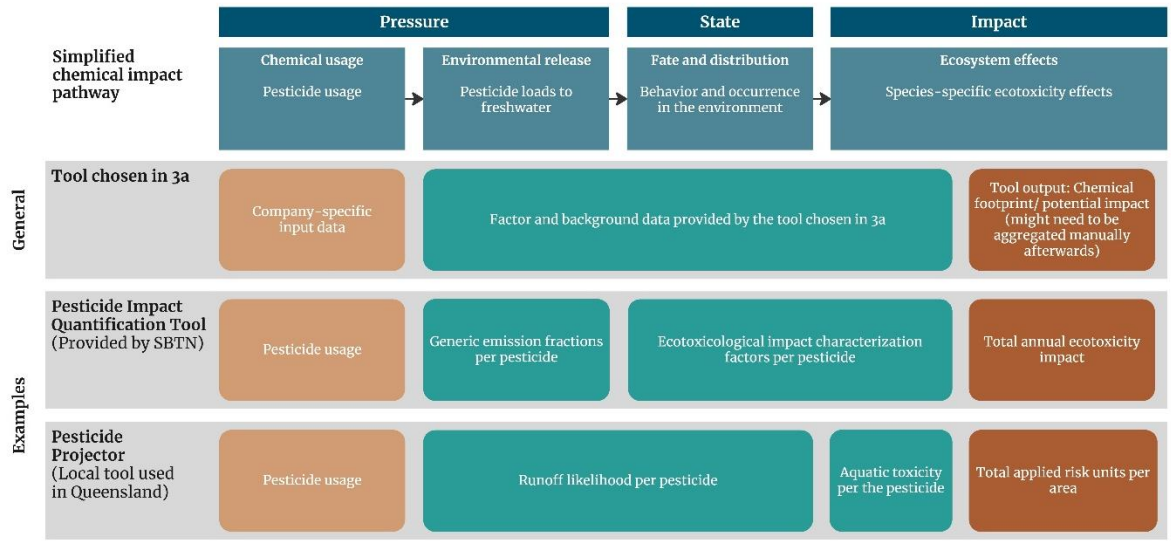


Figure 6: Overview of pesticide-related potential ecotoxicity impact quantification using different tools. Company data are only required for pressure indicators, while tools to derive a company's potential ecotoxicity impact provide factors to approximate potential impact from reported pressures. The input, factors, and outputs are displayed in a simplified way. (Source: Authors).

The primary goal of this step is to understand a company's baseline and provide a decision-support tool to identify which pesticides to tackle first for potential impact reduction. However, these tools should not be the sole source for reporting on target achievement.

Further information on applying the PIQ Tool as one of the available chemical footprint tools can be found in the PIQ Tool Manual.

Req. 44—Pesticide impact quantification

Companies must convert their pesticide usage information into a single freshwater ecotoxicity impact value for each basin. This *must* be done using SBTN's Pesticide Impact Quantification (PIQ) Tool or an appropriate alternative tool selected during Step

3a.

The total baseline ecotoxicity impact *must* be calculated as outlined in the PIQ Tool Manual.

For every basin in scope, companies *must* submit their completed tool spreadsheet or equivalent calculation file to show how their baseline was calculated.

Companies *must* document how missing pesticides were treated, including whether proxies were used (see Rec. 7—Pesticide proxies). In case proxies are used the original pesticide active ingredient name and CAS number must also be reported.

The baseline submission for each basin must explicitly report the following outputs (provided, e.g., by the PIQ Tool):

- Data representativeness level for pesticide usage data used as input data;
- Total baseline ecotoxicity impact (in CTUe/year for the PIQ Tool);
- Flag pesticides for which impact characterization factors are not available in the selected chemical footprint tool (automatically done in the PIQ Tool);
- The percentage (%) of pesticide usage for which impact has not been quantified;
- The percentage (%) of total baseline ecotoxicity impact caused by HHPs (as defined by the PAN HHPs list).

And in case of any extrapolation based on the final tool output:

- The extrapolation methodology used.

Rec. 7—Pesticide proxies

Where an impact factor is unavailable, companies may use a conservative proxy:

- **First choice**: use the pesticide with the highest impact characterization factor within the same chemical class (e.g., within dithiocarbamates).
- **Second choice**: where no pesticide from the same chemical class is available, use the pesticide with the highest impact characterization factor within the same target class (e.g., within fungicides, herbicides, or insecticides).

If a conservative proxy is used, companies *must* report the original pesticide active ingredient name and CAS number alongside the proxy.

Rec. 8—PIQ Tool application for mandatory outputs

If other tools than the PIQ Tool are used to quantify the potential ecotoxicity impact but do not provide the mandatory outputs, the PIQ Tool can be used to obtain those outputs.

Pesticide producers and traders

The baseline represents the HHP active ingredients produced or traded by the company or business unit during the baseline period.

To determine which pesticides *must* or *should* be included in an HHPs Cessation target, companies *must* identify HHPs and pesticides listed by PAN as banned in any region. Further information on HHPs can be found in Box 10.

Req. 45—HHPs and banned pesticides reporting

Companies ***must*** list each pesticide active ingredient they produce or trade (name and CAS number), one per row, with the quantity produced or traded in each year of the baseline period and the average across those years. They ***must*** map these active ingredients against the most recent PAN HHPs and consolidated bans lists (as of 2026: PAN International List of HHPs [2024] and PAN Consolidated List of Banned Pesticides [2024]). The PIQ Tool *may* be used for this screening where it incorporates the most recent lists.

Companies ***must*** indicate which pesticides will be included in the HHPs Cessation target. Pesticides on the HHPs list ***must*** be included, and pesticides on the consolidated bans list ***should*** be included. Req. 68—HHPs Temporary Exemption outlines possible temporary exemptions.

This assessment may be done at a business unit or company level.

Steps 3c & 3d. Approach application and target setting

3.3 Setting Freshwater Quantity targets

What this section produces: One Freshwater Quantity target per basin, covering all water sources.

How it works: Three steps.

1. Calculate the required basin-wide reduction (Section 3.3.1). Identify a threshold for the desired state of nature and the reduction in present-day basin-wide withdrawals needed to meet it.
2. Allocate the reduction (Section 3.3.2). Apply the selected basin-wide percentage to the company baseline, giving one target per basin.
3. Set the time step and target year, and state the target (Sections 3.3.3 and 3.3.4).

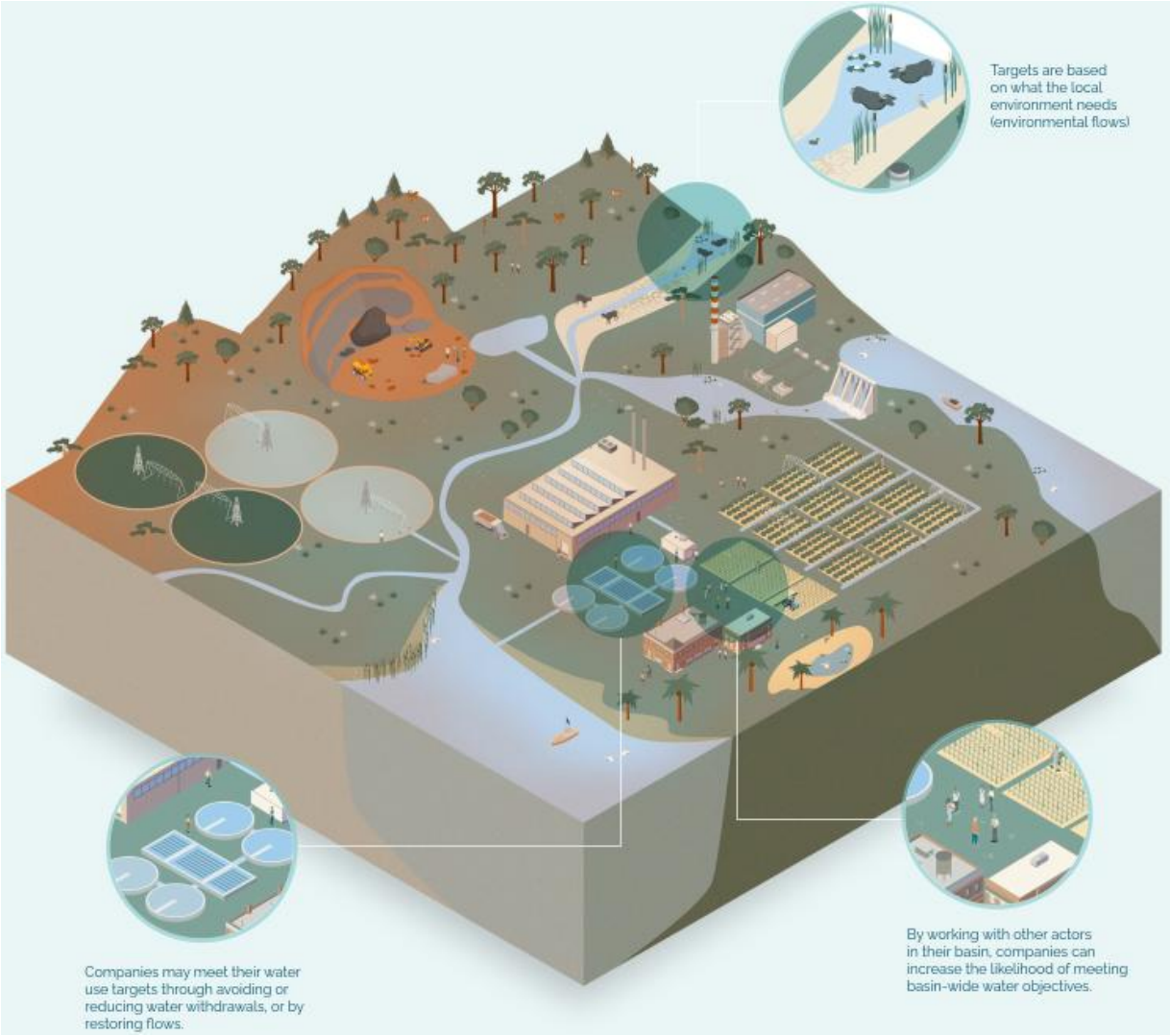


Figure 7: Freshwater Quantity targets.

Companies from all sectors can set Freshwater Quantity targets. These targets address pressure on surface water and groundwater from withdrawals in direct operations and upstream activities (Figure 7).

Each approach yields a basin-wide reduction percentage for each applicable pathway (Figure 9). The resulting target is an upper allowable limit with no buffer.

Task 6. Apply an approach for the basin and calculate required basin-wide pressure reductions

3.3.1 MAXIMUM ALLOWABLE LEVEL OF BASIN-WIDE WITHDRAWALS

Companies ***must*** apply the approach selected in Step 3a. Every option combines a threshold for the desired state of nature with a method that converts it into a maximum allowable level of basin-wide withdrawals. Global models handle both internally: the company specifies the basin and receives the required reduction.

Local approach

The local approach has three options, described in Section 3.1.1. For groundwater, including integrated surface water–groundwater models, a local approach is only acceptable where a designated management agency has applied the model as part of a groundwater management plan.

Req. 46—Application of the local approach (quantity)

Companies using the local approach *must* calculate the required basin-wide reduction using one of the following:

- 1a. Direct application of local models or methods: a hydrological model, and allocation scheme where relevant, approved by an authorized basin agency, showing that the basin-wide withdrawal level used for the target meets local e-flow requirements;
- 1b. Back-calculation: Equation 1, applied as set out in Req. 48—Applying Equation 1; or
- 1c. Alignment with government-established environmental objectives, applied as set out in Req. 49—Application of government-established environmental objectives.

For groundwater, the local approach *must* be based on a model applied by a designated management agency as part of a recognized groundwater management plan.

1a. Direct application of local models or methods

The company uses a local model to test basin-wide withdrawal scenarios. The maximum allowable level is the one that meets e-flow requirements in at least 75% of years, for each month of the simulation period. Unlike back-calculation (1b), this option does not assume that every unit withdrawn is lost from stream flow. It therefore suits basins where other pressures, such as dam operations, also prevent e-flows from being met.

A designated management agency may already have applied a model to specify allowable company-level pumping that protects nature. The company then uses that level as the basis for its target, and does not need to run the model itself.

A regionalized global model (Section 3.1.1) is applied under this option.

Req. 47—Regionalized global models

Where a regionalized global model produces results for both the surface water and groundwater pathways, companies *must* apply it to both. Companies *must not* pair a regionalized model result for one pathway with an SBTN-approved global model result for the other.

Where an applicable pathway is not covered by the regionalized model, companies *must* use the SBTN-approved global model result for that pathway and apply the most restrictive result (Req. 52—Combining pathways and sources).

1b. Back-calculation from existing results

This option uses existing e-flow information. It assumes that any change in withdrawals is reflected one-for-one in stream flow, meaning that withdrawals are the main cause of the e-flow gap.[8] The required reduction in withdrawals then equals the required increase in stream flow. Three inputs are needed: present-day stream flow, natural stream flow (without withdrawals), and locally derived e-flow requirements.

The required reduction is the ratio of excess withdrawals (e-flow requirement minus present-day flow) to present-day withdrawals (natural flow minus present-day flow), as shown in Equation 1.

[8] This assumption is best made when factors such as groundwater depletion or dam operations are not dominant in affecting the flow regime, as has been documented in some cases, e.g., Döll et al., 2009.

Equation 1

$$\%\ \text{Reduction in basin-wide withdrawal required} = \frac{\text{Excess withdrawal}}{\text{Present-day withdrawal}} \times 100$$

In the example in Figure 8, excess withdrawals are 3×10^7 ML/month and present-day withdrawals are 50×10^6 ML/month. Basin-wide withdrawals *must* therefore fall by 60% (30 ÷ 50) to meet e-flow requirements.

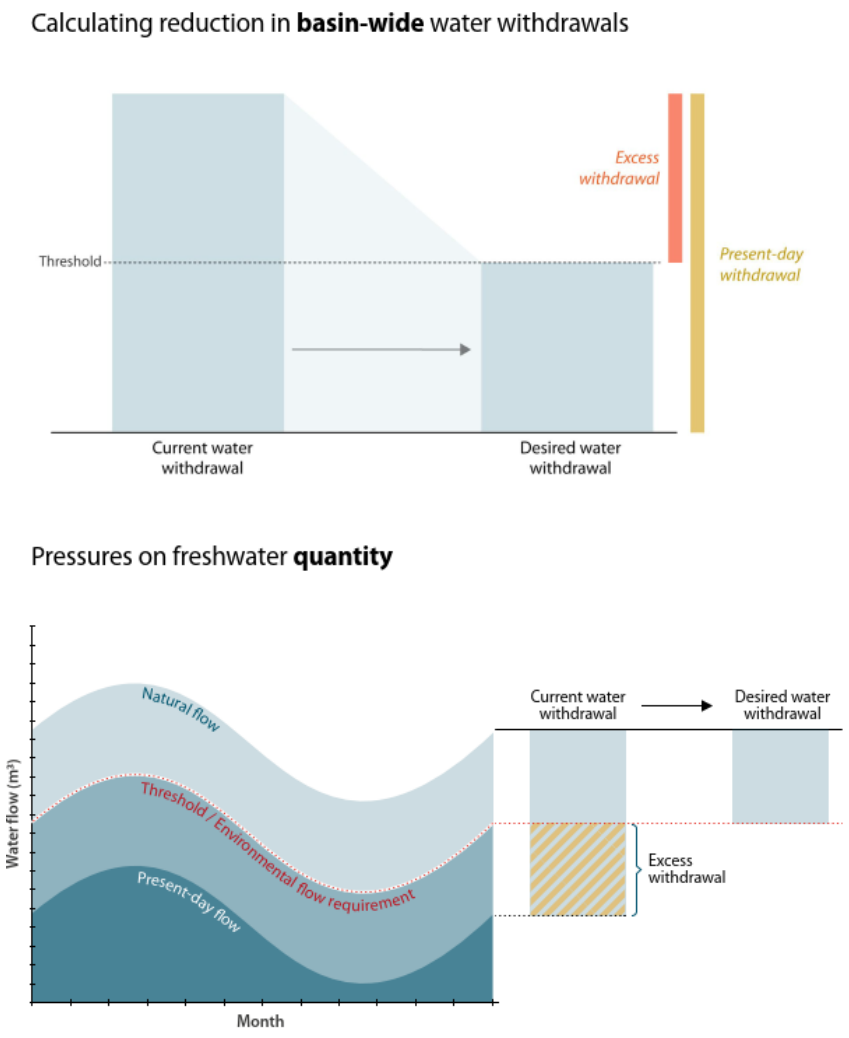


Figure 8: Calculating the required basin-wide reduction. Top: the excess withdrawal is the portion of present-day withdrawal above the threshold. Bottom: over a year, the excess withdrawal is the gap between the e-flow requirement (threshold) and present-day flow; present-day withdrawal is the gap between natural and present-day flow.

Req. 48—Applying Equation 1

Companies *must* apply Equation 1 to each basin within the target boundary, for each month of each year of the available flow record. The record *must* cover at least 20 years to capture interannual variability in precipitation.

For each month, the required reduction is the 75th percentile of that month's values across all years, i.e., the value exceeded in 25% of years.[9] These monthly values are applied to the company baseline in Section 3.3.2.

This is an exception to Req. 10—Temporal basis for back-calculation: for monthly flow records, the percentile is taken within each month rather than across the full period. See Req. 11—Subject-matter expert support for back-calculation for when SME support is required and the conditions under which a different aggregation may be applied.

1c. Alignment with government-established environmental objectives

Companies *may* use government-established environmental objectives identified in Step 3a, and assessed against the criteria in Appendix B, to define the maximum allowable basin-wide withdrawals. This aligns targets with publicly defined outcomes; it does not replace an assessment of ecological thresholds. Requirements for applying these objectives, including translation into an allowable pressure level, treatment of multiple objectives, and cases where no company-level allocation is specified, are set out in Req. 49—Application of government-established environmental objectives.

Req. 49—Application of government-established environmental objectives

Where companies use a government-established environmental objective to define the maximum allowable basin-wide pressure, they must:

- Translate the objective into an allowable pressure level or basin-wide reduction where this is not already specified, using the direct application or back-calculation approach;
- Apply the most stringent value where multiple relevant objectives exist for the same basin and pressure;
- Ensure consistency with the defined spatial and temporal scope of the target.

Objectives may only be used where they reflect an ecologically protective state of nature and are consistent with Appendix B criteria.

Where an objective is defined at basin scale but does not specify company-level allocations, companies must apply the allocation approach for the relevant pressure (Sections 3.3.2, 3.4.2, 3.5.2).

Global approach

The global approach has two pathways, each with one SBTN-approved global model. The company specifies the basin(s) and obtains the required basin-wide reduction from the model results. Because these models use global rather than local data, results *may* over- or underestimate local conditions. Model documentation is summarized in Appendix B.

Surface water pathway: environmental flows

Hogeboom's water quantity global model (Hogeboom et al., 2020) applies Equation 1 using global hydrological model outputs. For each Pfafstetter Level 5 basin, it gives the monthly reduction needed to meet e-flow requirements about 75% of the time over 1990–2019.

[9] This percentile was suggested by Hogeboom's water quantity global model as a level that balances ambitious reduction goals with the realization that a certain amount of freshwater must be made available for use.

Results are available on the Water Footprint Network platform and in the Basin Threshold Tool. This pathway applies wherever surface water or groundwater withdrawals affect e-flows.

Req. 50—Application of the Hogeboom model

> Under the global approach, companies ***must*** take the required basin-wide reduction to protect e-flows from Hogeboom's water quantity global model results for the basin.

Groundwater pathway: groundwater levels

The SBTN global groundwater model, GSGM-2 (Liu et al., 2026), provides for each Pfafstetter Level 5 basin the minimum reduction in basin-wide groundwater pumping needed for a stable or rising groundwater-level trend. Basins where no tested reduction measures—including stopping all pumping—are classified as non-reversing. Results are available in the SBTN State of Nature Water Layers app and the Basin Threshold Tool.

Req. 51—Application of the GSGM-2 model

> Under the global approach, companies ***must*** use the GSGM-2 results for the given basin to set the required reduction in basin-wide groundwater pumping to protect groundwater levels. In basins classified as non-reversing, the required reduction in groundwater pumping is 100%.

Combining pathways and sources

Water sustainability has often been assessed one source at a time, even though groundwater pumping and surface water availability are closely coupled (Richter et al., 2026). SBTN's Freshwater Quantity targets therefore reflect both pathways in a single basin target. Companies set one Freshwater Quantity target per basin, covering all water sources. The reduction applied depends on two things: whether groundwater depletion is a concern in the basin, and where the company's water comes from (Figure 9). Where the company uses groundwater, a mix of sources, or does not know its source, the larger reduction applies.

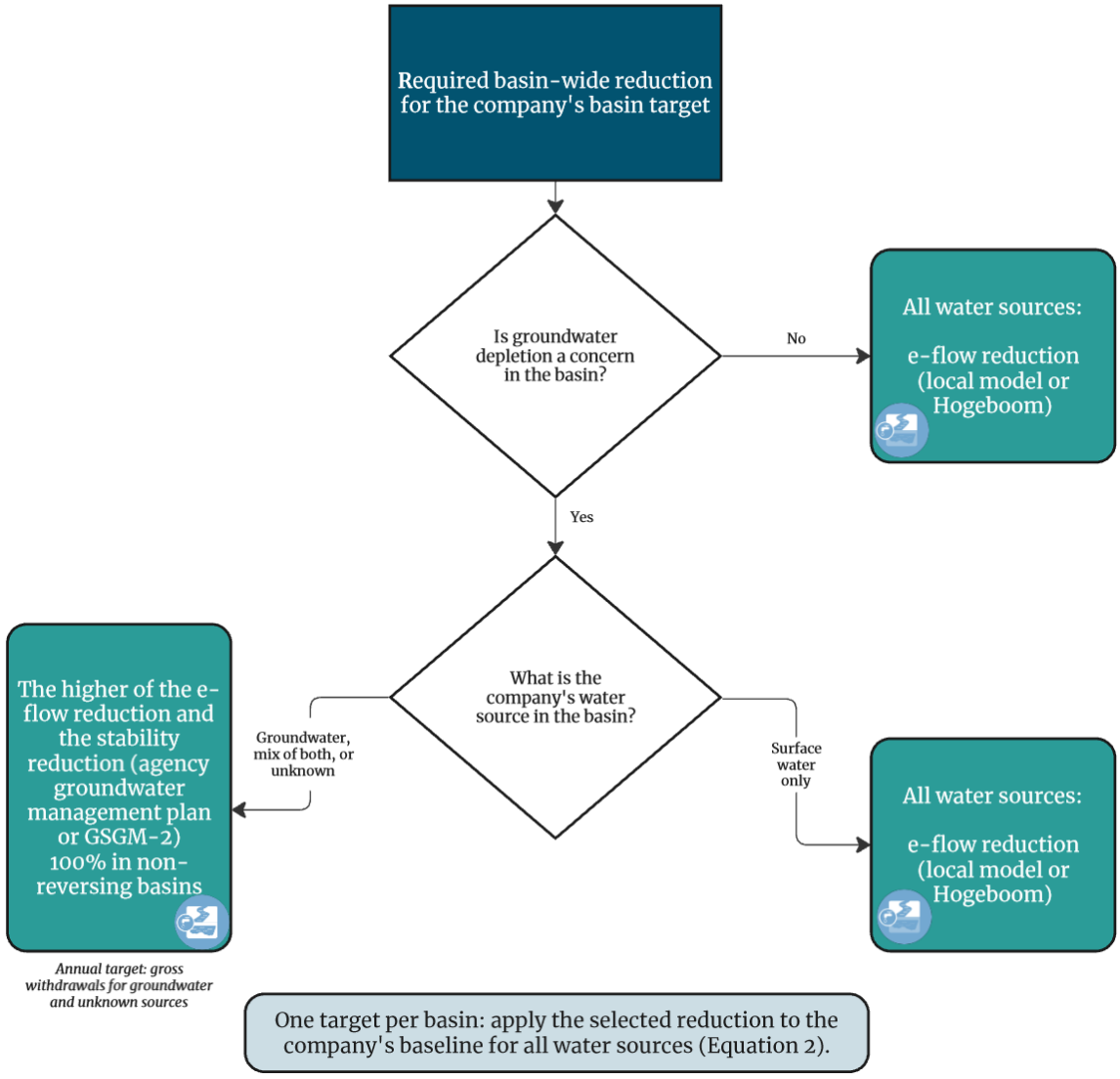


Figure 9: Selecting the required basin-wide reduction for a company's basin target. The e-flow reduction comes from the selected local model or Hogeboom's model; the stability reduction comes from the agency model or GSGM-2.

Req. 52—Combining pathways and sources

Companies *must* set one Freshwater Quantity target per basin, applying a single required reduction to the baseline for all water sources in that basin. The required reduction is selected as follows:

- *Where groundwater depletion is not a concern:* companies *must* apply the e-flow reduction, regardless of water source.
- *Where groundwater depletion is a concern, and the company uses only surface water:* companies *must* apply the e-flow reduction.
- *Where groundwater depletion is a concern, and the company uses groundwater, a mix of surface water and groundwater, or cannot determine its water source:* companies *must* apply the higher of the e-flow reduction and the reduction needed for stable groundwater levels. In non-reversing basins, this reduction is 100%.

Companies *must* document the water source of each production unit and sourcing location in the basin, with supporting evidence. Where the source cannot be determined, it *must* be assumed to be groundwater.

Where groundwater depletion is a concern, groundwater withdrawals and withdrawals of unknown source *must* be expressed as gross withdrawals in the baseline and target.

Return flows *may* be credited only through reinjection that meets the groundwater conditions in Section 3.2.3.

Task 7. Set company Freshwater Quantity and Quality targets

3.3.2 DETERMINING COMPANY-SPECIFIC FRESHWATER QUANTITY TARGETS

SBTN allocates the basin-wide reduction using **equal contraction of efforts**: every water user in the basin reduces by the same percentage.[10] Each company sets one target per basin: its baseline for all water sources, reduced by the selected basin-wide percentage (see Equation 2 and Figure 10).

Equation 1

$$\text{Company target withdrawal} = \frac{100 - \text{\% Reduction in basin-wide withdrawal required}}{100} \times \text{Present-day company withdrawal}$$

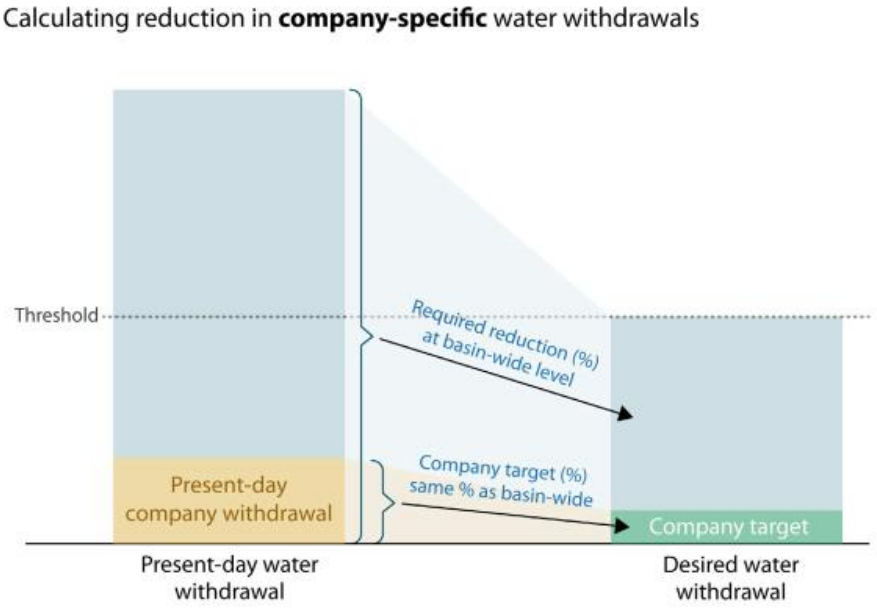


Figure 10: Equal contraction of efforts. The required percentage reduction of total basin withdrawals is applied to the company's own withdrawals.

The percentage applies to the baseline in whichever metric it uses, withdrawals or consumption (Section 3.2.3). A consumption-based target *may* be met by increasing return flows instead of reducing abstraction, provided the return flow conditions in Section 3.2.3 are met, and the change is disclosed. Box 11 explains the design choices behind this allocation method, and Box 13 works through a full example.

Req. 53—Freshwater Quantity target calculation

Companies *must* calculate each company-specific target by applying Equation 2 to the

[10] 'Contributions' can be reductions in 'negative' actions leading toward undesirable outcomes, like pollution, or 'positive' actions leading toward desirable outcomes like improved ecosystem integrity.

baseline (Section 3.2), as one target per basin covering all water sources (and, for monthly targets, each month). Targets *must* be expressed as a maximum volume per time period (e.g., ML/year or ML/month) to be achieved by the target year.

The same basin-wide reduction percentage applies whether the baseline is expressed as withdrawals or consumption. Companies *must not* convert between the two when applying the reduction, and *must* track progress in the metric used for the baseline and target.

Where the calculated basin-wide reduction is zero or negative, it *must* be set to zero. The target *must not* exceed the baseline. A target set at 0% is a maintenance target and *must* be identified as such in the coverage disclosure and in claims (see If thresholds are already met, Section 3.1.2).

Companies *must* submit the target calculated with Equation 2 for validation, together with documentation of how the basin-wide reduction was derived.

Rec. 9—Setting more stringent targets Freshwater Quantity targets

Companies are encouraged to set targets more ambitious than the science-based target where feasible. Where they do, they *should* explain their reasoning to inform future method development.

Box 11: Design choices behind equal contraction of efforts.

Why this method. Equal contraction of efforts is simple: it needs only the company's own baseline. It does not weigh social, economic, technological, or political factors, and it is not a judgment of responsibility for basin degradation.

Early action. Because reductions apply to each company's baseline, reductions made before the baseline period are not credited automatically, and larger users retain proportionally larger volumes. Using the five-year baseline in Section 3.2 limits this effect. Step 4 guidance *may* recognize earlier action, and future versions of the method *may* test other allocation approaches.

Collective action. The method assumes that users respond proportionally. Where groundwater responds non-linearly or with delay, basin-level coordination is encouraged (Step 4). Individual targets do not preclude collective action: Steps 4 and 5 will cover how to implement and track it, and wider benefit and responsibility sharing is addressed through supplier engagement in Steps 1 and 2.

3.3.3 TIME STEP FOR FRESHWATER QUANTITY TARGETS

Targets *may* be annual or monthly, depending on the baseline. Monthly targets suit withdrawals that vary by season, such as irrigation; annual targets suit steady withdrawals, as in many direct operations. Where the groundwater-level reduction applies, the target is annual.

Req. 54—Freshwater Quantity time step

- Where the baseline uses annual values, targets *must* be annual and *must* apply the largest monthly required reduction.
- Where the baseline uses monthly values, targets *may* be monthly or annual. An annual target *must* apply the largest monthly required reduction. For example, if

50% is required in some months and 0% in others, the annual target requires a 50% reduction.

- Where the higher of the e-flow and groundwater-level reductions applies (Req. 52—Combining pathways and sources), the target *must* be annual and *must* use the higher of the stability reduction and the largest monthly e-flow reduction.

3.3.4 TEMPLATE STATEMENT FOR FRESHWATER QUANTITY TARGETS

The target year depends on the size of the required reduction. These timeframes balance the urgency of progress with the time companies need to act.

Req. 55—Target year for Freshwater Quantity and Nutrient Freshwater Quality

Where the required reduction is less than 25%, the target year *must* be five years from submission. With adequate justification, submitted for validation, it *may* be up to ten years. The justification *must* show that the later date:

1. Aligns with the time frame of global societal or policy goals (e.g., the Global Biodiversity Framework or the UN Sustainable Development Goals);
2. Aligns with the time frame of local or regional government-established objectives, policy goals, or voluntary goals; or
3. Is supported by documented stakeholder engagement or other tangible actions critical to achieving the target in that basin.

Each basin has one target statement (see Box 12), covering all water sources and stated in the metric used for the baseline (withdrawals or consumption).

Box 12: Template statements for Freshwater Quantity targets.

Annual target: "[Company X] will reduce its water [withdrawals/consumption] in the [basin name] basin to [X] ML/year by [target year], applying the [X]% basin-wide reduction required in that basin to its [baseline period] baseline, based on [model or method] results."

Monthly target: "[Company X] will reduce its water [withdrawals/consumption] in the [basin name] basin to the following volumes by [target year]: [month]: [X] ML/month; [month]: [X] ML/month; …"

Box 13 brings Sections 3.3.1–3.3.4 together in a worked example, from the basin-wide reductions to the target statement.

Box 13: Worked example—from basin-wide reduction to company target.

A company has one site in a basin where groundwater depletion is a concern. It draws water from both surface water and groundwater, and its baseline (2021–2025 average, Section 3.2) is 300 ML/year. It uses the global approach.

Step 1—Basin-wide reductions. Hogeboom's model requires 30% in the driest month and 0% in all other months, so the e-flow reduction is 30%, the largest monthly value (Section 3.3.3). GSGM-2 requires 45% for stable groundwater levels.

Step 2—Select the reduction and set one basin target. Because the company uses groundwater, it applies the higher of the two reductions, 45%, to its whole basin baseline: 300 × 0.55 = 165 ML/year. The table shows how the selected reduction depends on the water source, for the same 300 ML/year baseline:

Company water source	Reduction applied	Basin target (ML/year)
Surface water only	30% (e-flow)	300 × 0.70 = 210
Groundwater only	45% (higher of 30% and 45%)	300 × 0.55 = 165
Mix of both (this company)	45% (higher of 30% and 45%)	300 × 0.55 = 165
Unknown	45% (higher of 30% and 45%)	300 × 0.55 = 165

Step 3—Target year and statement. The reduction is 25% or more, so the target year *may* be up to ten years from submission. The target is annual because the groundwater-level reduction applies: "[Company X] will reduce its water withdrawals in the [basin name] basin to 165 ML/year by 2036 (45% reduction compared to its 2021–2025 baseline), based on Hogeboom's water quantity global model and GSGM-2 results."

3.4 Setting nutrient Freshwater Quality targets

What this section produces: A target for each nutrient requiring reduction—nitrogen, phosphorus, or both—in each basin.

How it works: The same three steps as for Freshwater Quantity targets, adjusted because thresholds are defined as concentrations while your pressure is a load.

1. Calculate the required basin-wide reduction (Section 3.4.1). Identify a threshold for the desired state of nature and the reduction in basin-wide N and P loads needed to meet it.
2. Allocate the reduction (Section 3.4.2). Apply the basin-wide percentage for each nutrient to the company baseline load.
3. Set the time step and target year, then state the target (Sections 3.4.3 and 3.4.4).

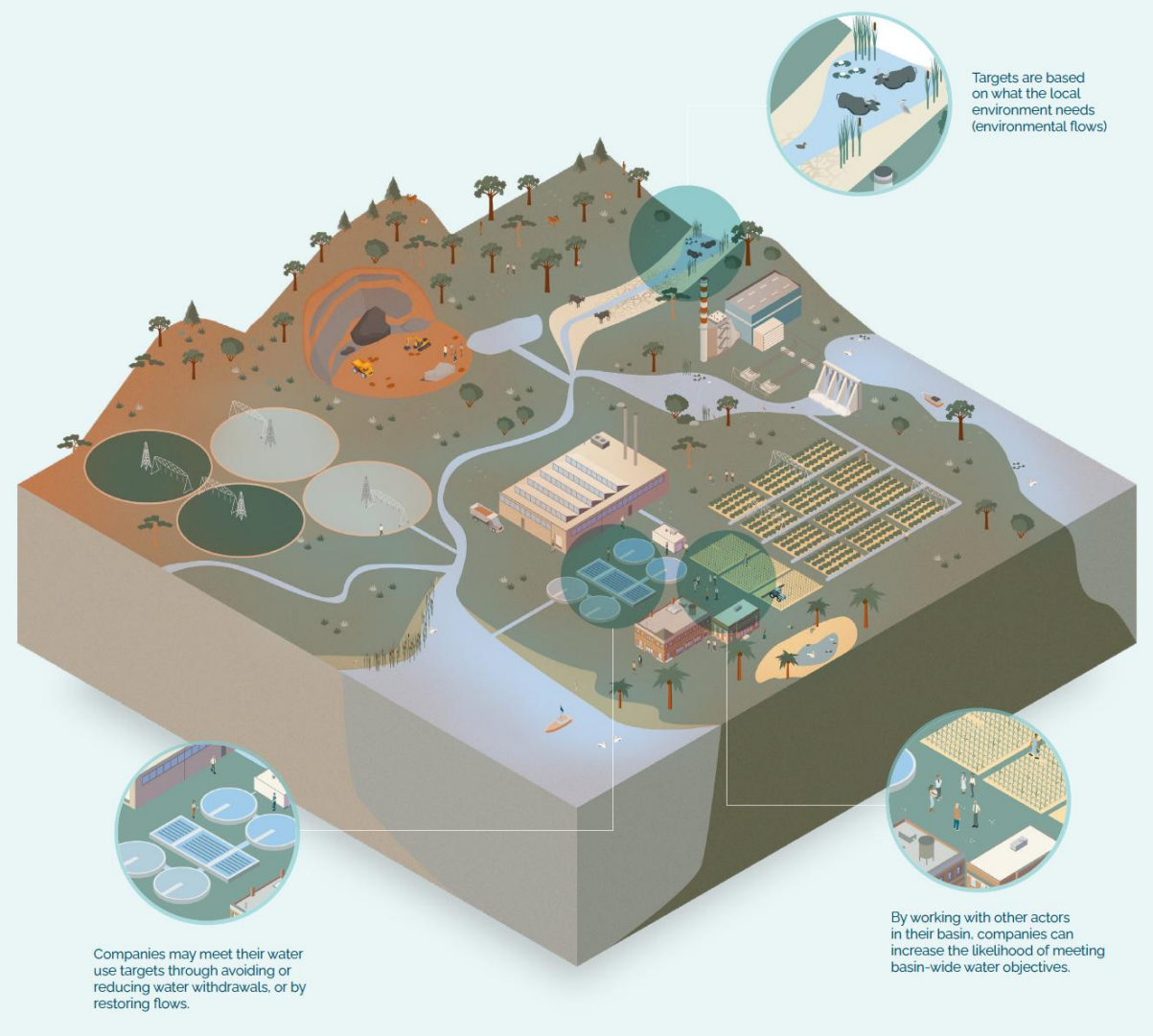


Figure 11: Freshwater Quality targets for nutrients.

Nutrient Freshwater Quality targets address nitrogen (N) and phosphorus (P) loads entering surface water bodies from point sources (e.g., discharge pipes) and nonpoint sources (e.g., agricultural runoff), in direct operations and upstream activities (Figure 11).

Each approach produces a basin-wide reduction percentage for each nutrient. The resulting target is an upper allowable limit with no buffer.

Task 6. Apply an approach for the basin and calculate required basin-wide pressure reductions

3.4.1 MAXIMUM ALLOWABLE LEVEL OF BASIN-WIDE NUTRIENT LOAD

Link between nutrient concentrations and loads

Nutrient freshwater quality targets translate state-based indicators (e.g., instream nutrient concentrations) into pressure-based targets (e.g., nutrient loads). Thresholds are typically defined in terms of concentrations, while company pressures are measured as loads.

The approaches described in this section provide methods to link these two, either through models, proportional relationships, or integrated assessments, in order to derive the required reduction in basin-wide nutrient load.

Local approach

Under the local approach, a reduction is required for each nutrient for which the local resource defines a threshold that is not met. Where the local resource defines a threshold for one nutrient only, the other nutrient follows its own approach selection (Step 3a), for example, the global approach where no local threshold exists. Where a local resource addresses both nutrients jointly (for example, a eutrophication model representing co-limitation), the reductions *may* be derived in a single integrated assessment.

The local and global approaches therefore scope nutrients differently. The global approach applies fixed global threshold values and so requires the N:P screen in Table 9 to establish which nutrient governs the ecological condition within a given basin. Local thresholds meeting the criteria in Appendix B are already based on ecological endpoints and basin-specific nutrient dynamics, so the local approach requires no additional limitation screen.

Req. 56—Application of the local approach (nutrients)

Companies using the local approach *must* calculate the required basin-wide reduction using one of the following:

- 1a. Direct application of local models or methods: a model showing that the target instream concentrations, or freshwater quality endpoints such as chlorophyll-a or dissolved oxygen, are achieved over the simulation period;
- 1b. Back-calculation: Equation 3, applied as set out in Req. 57—Applying Equation 3; or
- 1c. Alignment with government-established environmental objectives, applied as set out in Req. 58—Alignment with government-established environmental objectives.

Companies *must* express the required basin-wide reduction separately for nitrogen and phosphorus, so that each can be applied to the corresponding baseline load (Section 3.4.2).

Companies *must* document which nutrients were assessed and, where more than one combination of N and P reductions would meet the applicable thresholds, the combination selected and the rationale.

1a. Direct application of local models or methods

This option applies when a local model and freshwater quality thresholds are available for the basin. Companies determine the maximum allowable nutrient load by using the model to evaluate reduction scenarios and demonstrate that the target instream concentrations are achieved over the simulation period. It also allows targets to be set based on freshwater quality endpoints (e.g., chlorophyll-a, dissolved oxygen), which reflect the impact of nutrient pollution rather than the instream nutrient concentration.

1b. Back-calculation from existing results

This option is used to estimate the maximum allowable nutrient load (in mass per unit time, such as kg/year) required to achieve a target instream nutrient concentration. This method assumes that instream nutrient concentrations are directly proportional to nutrient loading rates (e.g., Preston et al. 2011) and that nutrient loads consist of human-induced and natural background/reference sources. Using these assumptions, companies can:

- Compare current concentrations with threshold concentrations; and

- Calculate the required reduction in nutrient load needed to meet the desired state of nature.

The required reduction is determined using the same principle applied in Freshwater Quantity science-based targets. For water quality, pressure is represented by instream nutrient concentration, based on the proportional relationship between loads and concentrations, as shown in Equation 3. The denominator is the human-induced concentration: the current concentration minus the natural reference concentration. Where the local source does not provide a reference concentration, companies must derive it from the State of Nature Water Layers app (total minus human-induced concentration for the relevant nutrient and basin) and subtract it from the local current concentration. Where neither source provides a value, the reference concentration is taken as zero. Req. 57—Applying Equation 3 sets out these requirements.

Equation 2

$$\%\ \text{Reduction in basin-wide nutrient load required} = \frac{\text{Current nutrient concentration} - \text{Threshold nutrient concentration}}{\text{Human-induced nutrient concentration}} \times 100$$

Threshold concentrations *may* be specified at different temporal resolutions, for example as a never-to-be-exceeded value, a seasonal average, or an annual average. The percentage from Equation 3 is applied to the company baseline in Section 3.4.2.

Req. 57—Applying Equation 3

The temporal resolution of the assessment *must* match that of the threshold.

Companies *must* calculate the denominator as the current concentration minus the natural reference concentration. Where the local source does not provide a reference concentration, companies *must* derive it from the State of Nature Water Layers app as the total concentration minus the human-induced concentration for the relevant nutrient and basin, and subtract it from the local current concentration. Where neither source provides a value, the reference concentration is taken as zero (i.e., the human-induced concentration equals the current concentration), and companies *must* disclose this.

Where local results span fewer than five years, companies *must* state the period used and why it is representative of present-day conditions.

See Req. 11 for SME support requirements and the conditions under which a different aggregation may be applied.

Alignment with government-established environmental objectives

Where suitable government-established environmental objectives are identified (see Section 3.1), companies *may* use them to define the maximum allowable basin-wide nutrient load.

Req. 58—Alignment with government-established environmental objectives

When applying government-established environmental objectives, companies *must*:

- Use only objectives that reflect an ecologically protective state of nature and meet the criteria in Appendix B;
- Translate the objective into an allowable load or basin-wide reduction, where not already specified, using direct application or back-calculation; and
- Apply the most stringent value where multiple objectives exist.

Global approach

To support the global approach, companies use results from global freshwater quality models (McDowell et al., 2025) to determine the maximum allowable basin-wide nutrient load. This approach links modeled instream nutrient concentrations to ecologically protective thresholds and enables the calculation of required basin-wide reductions. Results are available in the Basin Threshold Tool and the SBTN State of Nature Water Layers app.

This approach is based on the global classification framework of McDowell et al. (2025), which identifies nutrient limitation and ecological condition using N:P ratios and concentration thresholds. The method presented here translates this classification into actionable reduction targets by applying the same logic to determine basin-wide reduction requirements.

The global model provides four key outputs for each basin:

- Median instream concentrations of total nitrogen (N) and total phosphorus (P);
- The limiting nutrient condition based on the N:P ratio;
- The degree to which concentrations exceed ecologically protective thresholds;
- Median human-induced concentrations of N and P, used directly as the denominator in Equation 3.

Global threshold values are defined as:

- Total nitrogen (N): 0.80 mg N/L
- Total phosphorus (P): 0.046 mg P/L

Nutrient limitation is determined using the Redfield ratio framework:

- N:P < 7 → nitrogen-limited system
- 7 ≤ N:P ≤ 15 → co-limited system
- N:P > 15 → phosphorus-limited system

Based on these conditions, required basin-wide reductions are derived as shown in Table 9.

Table 9: Summary of how limiting nutrient conditions and threshold exceedance determine which nutrients require reduction and how reduction percentages are calculated.

Scenario (Based on N:P Ratio)	Basin Condition	Threshold Check	Required Reduction (Phosphorus, P)	Required Reduction (Nitrogen, N)	What This Means
P-limited system (N:P > 15)	Phosphorus limits ecosystem response	P > 0.046 mg/L	(Current P - Threshold P) ÷ Human-induced P	0%	Focus reductions only on phosphorus. Nitrogen is

					not limiting.
		P ≤ 0.046 mg/L	0%	0%	Phosphorus, the limiting nutrient, is within its threshold. No reduction needed.
Co-limited system (7 ≤ N:P ≤ 15)	Both nitrogen and phosphorus influence ecosystem response	P > 0.046 mg/L and N > 0.80 mg/L	(Current P - Threshold P) ÷ Human-induced P	(Current N - Threshold N) ÷ Human-induced N	Reduce both nutrients where each exceeds thresholds.
		P > 0.046 mg/L and N ≤ 0.80 mg/L	0%	0%	Co-limited growth acceptable. No reductions required.
		N > 0.80 mg/L and P ≤ 0.046 mg/L	0%	0%	Co-limited growth acceptable. No reductions required.
		P ≤ 0.046 mg/L and N ≤ 0.80 mg/L	0%	0%	No reductions required.
N-limited system (N:P < 7)	Nitrogen limits ecosystem response	N > 0.80 mg/L	0%	(Current N - Threshold N) ÷ Human-induced N	Focus reductions only on nitrogen; phosphorus is not limiting.
		N ≤ 0.80 mg/L	0%	0%	No reduction needed.

Interpreting Table 9

The table operationalizes the global model results into reduction requirements using the following logic:

1. Identify the limiting nutrient condition using the basin-specific N:P ratio;
2. Assess whether nutrient concentrations exceed global thresholds;
3. Apply reductions only to nutrients that exceed their thresholds and contribute to ecological limitation. In co-limited systems, reductions are required only where both nutrients exceed their thresholds.

Reducing one nutrient can shift which nutrient limits growth. The limitation status is taken from the model results at target setting and stays fixed for the target period; a change in limitation status is reassessed when the baseline is recalculated (Section 3.2.2), or when the target is renewed.

Reduction percentages are calculated with Equation 4, using the same human-induced denominator as Equation 3.

Equation 4

$$\%\ \text{Reduction in basin-wide nutrient load required} = \frac{\text{Current nutrient concentration} - \text{Threshold nutrient concentration}}{\text{Human-induced nutrient concentration}} \times 100$$

Figure 12 illustrates how current and desired freshwater quality pressures are compared to derive the required reduction in basin-wide nutrient loads for nitrogen or phosphorus.

Ambition levels

Where the natural reference concentration already exceeds the threshold, the threshold cannot be met even by removing all human-induced load. Under the global approach, the natural reference concentration is the total minus the human-induced concentration from the State of Nature Water Layers app. In this case, companies apply one of the following ambition levels:

- Ambition level 1 (minimum): a reduction of at least 80% of the required model reduction;
- Ambition level 2: reduction of at least 90% of the required model reduction;
- Ambition level 3: 100% of the required model reduction or more.

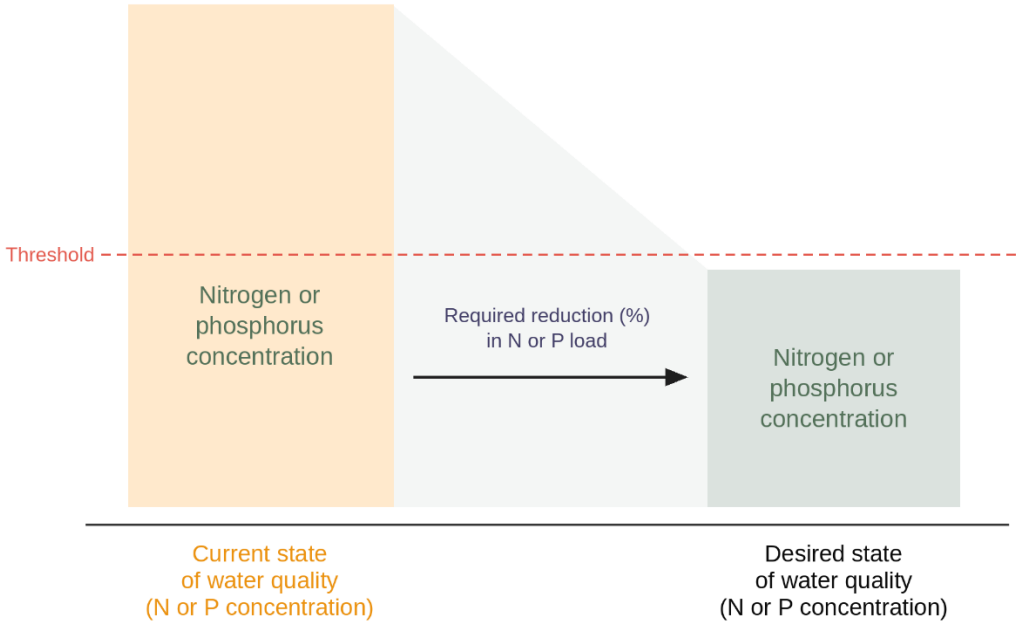


Figure 12: Pressures on freshwater quality. This illustration shows the relationship between current and desired levels for water quality pressures in the basin (either nitrogen or phosphorus).

Req. 59—Application of the McDowell approach

Under the global approach, companies ***must*** take the required basin-wide reductions for nitrogen and phosphorus from the McDowell et al. (2025) model results for the basin, applying the limitation screen and thresholds in Table 9 and Equation 4, using the human-induced concentration from the State of Nature Water Layers app as the denominator. Where concentrations are below the applicable threshold, the required reduction is 0%.

Req. 60—Ambition levels where the reference concentration exceeds threshold

Where the natural reference concentration exceeds the threshold, companies ***must*** apply at least Ambition level 1 and ***must*** state the level selected.

Task 7. Set company Freshwater Quantity and Quality targets

3.4.2 DETERMINING COMPANY-SPECIFIC NUTRIENT FRESHWATER QUALITY TARGETS

Once the required basin-wide reduction has been determined (Section 3.4.1), apply it to the company's baseline for each nutrient using equal contraction of efforts (Section 3.3.2): Equation 5a for nutrient loads and Equation 5b for gray water footprints.

Equation 5a

$$\text{Company target nutrient load} = \frac{100 - \text{\% Reduction in basin-wide nutrient load required}}{100} \times \text{Present-day company nutrient load}$$

Equation 5b

$$\text{Company target grey water footprint} = \frac{100 - \text{\% Reduction in basin-wide nutrient load required}}{100} \times \text{Present-day grey water footprint}$$

The targets set using Equation 5a or 5b, depending on the units used, assume the same "equal contraction of efforts" allocation approach as described earlier for freshwater quantity in Section 3.3.2. It is important to note that, when the model indicates a negative reduction, the percent reduction used in Equation 5a or 5b must be set to zero, i.e., target loads cannot be greater than present-day baseline loads.

Req. 61—Nutrient Freshwater Quality target calculation

Companies *must* calculate a separate company-specific target for each nutrient for which a reduction is required, by applying Equation 5a to the baseline nutrient load or Equation 5b to the baseline gray water footprint (Section 3.2.4).

Nutrient loads and gray water footprints *must not* be summed or converted into each other when applying the reduction.

Where the calculated basin-wide reduction is negative, it *must* be set to zero. The target *must not* exceed the baseline. A target set at 0% is a maintenance target and must be identified as such in the coverage disclosure and in claims (see If thresholds are already met, Section 3.1.2).

Companies *must* submit the target calculated with Equation 5a or 5b for validation, together with documentation explaining how the basin-wide reduction was derived.

Rec. 10—Setting more stringent targets Nutrient Freshwater Quality targets

Companies are encouraged to set targets more ambitious than the science-based target where feasible. Where they do, they *should* explain their reasoning to inform future method development.

Box 14: Worked example—Nutrient Freshwater Quality target with the global approach.

A company's baseline in a basin is 2,000 kg P/year and 30,000 kg N/year (Section 3.2.4). It uses the global approach.

Step 1—Limitation and thresholds (Table 9). The McDowell model gives median concentrations of 2.0 mg N/L and 0.10 mg P/L, so N:P = 20: a phosphorus-limited basin. P exceeds its 0.046 mg P/L threshold. N is not limiting, so its required reduction is 0%.

Step 2—Required reduction (Equation 4). The State of Nature Water Layers app gives a human-induced concentration of 0.08 mg P/L. The required reduction is (0.10 - 0.046) ÷ 0.08 = 67.5%. The natural reference concentration (0.10 - 0.08 = 0.02 mg P/L) is below the threshold, so no ambition level applies.

Step 3—Company target (Equation 5a). 2,000 × (100 - 67.5) ÷ 100 = 650 kg P/year. No N target is required.

Step 4—Target year and statement. The reduction is 25% or more, so the target year

may be up to ten years from submission: "[Company X] will reduce its nutrient load in the [basin name] basin to 650 kg P/year by 2036."

3.4.3 TIME STEP FOR NUTRIENT FRESHWATER QUALITY TARGETS

Targets *may* be annual or more frequent (e.g., seasonal or monthly). Seasonal targets suit thresholds that apply only in a growing season.

Req. 62—Nutrient Freshwater Quality time step

- Under the local approach, companies *may* use annual or shorter time periods, but the reduction *must* be consistent with the most stringent required reduction. For example, if a threshold applies only in the summer growing season and requires a 25% reduction, an annual target requires 25% across the whole year.
- Where the local basin authority specifies a growing season (e.g., May–September in the Northern Hemisphere), companies *may* set seasonal targets requiring reductions only in the months when the threshold applies.
- Under the global approach, companies *must* use the same time step as the baseline: an annual baseline gives an annual target, and a monthly baseline gives monthly targets. With a monthly baseline, companies *may* either set individual monthly targets or apply the most ambitious monthly reduction annually.

3.4.4 TEMPLATE STATEMENT FOR NUTRIENT FRESHWATER QUALITY TARGETS

The target year is set as described in Section 3.3.4 (Req. 55). The same rule applies to nutrient targets.

Each nutrient for which a reduction is required has its own target value (see Box 15):

Box 15: Template statements for Nutrient Freshwater Quality targets.

Annual target (loads): "[Company X] will reduce its [nitrogen/phosphorous] load in the [basin name] basin to [X] kg [N/P]/year by [target year], applying the [X]% basin-wide reduction required in that basin to its [baseline period] baseline, based on [model or method] results."

Seasonal or monthly target (loads): "[Company X] will reduce its[nitrogen/phosphorous] load in the [basin name] basin to [X] kg [N/P]/month for each of the following months: [months]. The reductions will occur by [target year], applying the [X]% basin-wide reduction required in that basin to its [baseline period] baseline, based on [model or method] results."

Annual target (gray water footprint): "[Company X] will reduce its gray water footprint in the [basin name] basin to [X] ML/year by [target year]."

3.5 Setting Pesticide Freshwater Quality targets

What this section produces: Up to three targets, depending on a company's role in the value chain, traceability, and data availability (see Section 1.4 to confirm which apply). For the Pesticide Impact Reduction and HHPs Cessation targets, the pesticide baselines in Section 3.2.5 are also needed:

- **Pesticide Impact Reduction** (Section 3.5.1)—a quantitative reduction in your

potential ecotoxicity impact;

- **HHPs Cessation** (Section 3.5.2)—phasing out highly hazardous pesticides
- **Pesticide Landscape Engagement** (Section 3.5.3)—collective action at landscape level.

How it works: Only the Impact Reduction target follows the reduction logic used for quantity and nutrients. HHPs Cessation is based on hazard elimination, and Landscape Engagement on collective action.

The Pesticide Freshwater Quality target guidance is designed to support companies in setting targets that go beyond compliance with local regulations. Additionally, compliance with local water quality standards cannot be fully ensured through the actions of individual actors (e.g., a farm not using pesticides might still be located in an area with transgressed environmental quality standards, driven by pesticide use on other farms or in upstream locations feeding into a specific basin). Therefore, demonstrating compliance with applicable local regulations is not part of this target-setting methodology. Companies are nevertheless expected to comply with all applicable local regulatory requirements.

Companies should increase ambition by taking chemical mixtures in local water bodies into account and aim to reduce their own impacts as much as feasible (i.e., get close to or achieve best practices).

While guidance on acting on pesticide targets is provided in Step 4: Act, companies are encouraged to consider implications early in the target-setting process (see Box 16) and to explore pest management solutions beyond the use of chemical pesticides.

Importantly, acting on the Pesticide Impact Reduction target does not require every baseline unit to reduce potential impact by the defined reduction, but rather to reduce potential impact across company activities at a basin level.

Box 16: Preparing to act on freshwater pesticide impact reduction

SBTN recommends that companies follow a holistic approach when acting on Freshwater Pesticide Impact Reduction targets, by analyzing synergies and trade-offs for nature and people, and supporting farmers and suppliers in agricultural transitions. Specifically, SBTN recommends that companies adhere to three key principles when acting on pesticide targets to improve the feasibility of achieving targets and to reduce trade-offs:

1. *Address impacts on food security and livelihoods.* Pesticides, like nutrients, are important inputs in many agricultural systems. Many areas are facing increased pests due to climate change and, subsequently, yield losses. Additionally, farmers might be "locked in" to the use of specific pesticides (Blumenthal et al., 2022) or face cost issues when switching to alternative pest management or lower-impact pesticides. Actions toward this target should therefore be a part of wider sustainable agriculture and food systems transitions, including safeguards to maintain food security and consideration of the needs of those who rely on agri-food systems for their livelihoods, including smallholders, Indigenous Peoples, and other local communities. It is recommended that companies partner with and support farmers in their transition toward more sustainable agricultural practices to minimize burden shifting resulting from trade-offs involving food security and local livelihoods, for example, through financial support or the provision of agronomic expertise (see GBF Target 7, Section B, 2025). Companies may also choose to invest in research and development (R&D) on alternative pest management for phasing out hazardous pesticides or provide guarantees for their farmers and suppliers to enable security during agricultural transitions. Additionally, social safeguards outlined in Step 4: Act should be followed.

2. *Mitigate burden shifting to other nature realms*. Pesticide targets are focused on potential freshwater ecotoxicity impacts. However, assessing alternative pest-management mechanisms (e.g., mechanical pest control, less soluble active ingredients, and biopesticides) should minimize burden shifting (e.g., increases in greenhouse gas emissions and soil pollution). Companies should balance their freshwater objectives with their other climate and nature ambitions.
3. *Follow good agricultural practices when Plant Protection Products (PPPs) are used.* "Good agricultural practices" refer to practices that minimize pesticide emission to non-target areas and ensure worker safety. These include the following elements:
4. *Only apply pesticides if necessary* (tools to predict pest pressure, e.g., USPest, may help to avoid unnecessary pesticide usage).
    a. Only use the recommended dose as a maximum (minimum dose to be effective against the pest[s], see, e.g., EPPO, 2012).
    b. Only spray/treat the area needed (e.g., infected area for curative control).
    c. Only spray/treat under weather conditions that optimize the delivery of the pesticide to its target and minimize off-target movement.
    d. Ensure safety measures (such as protective equipment) are available for farmers.
    e. Ensure best practices are followed for the disposal of unused PPPs.

Pesticide Freshwater Quality targets will have an overall benefit only if the response options are focused on safer alternative pest management strategies. References to additional best practice guidance and response options (e.g., integrated pest management, cover crops, crop rotation, and diversification) are provided in Appendix E, including guidance from the United Nations Environment Programme on phasing out or replacing HHPs (e.g., see UNEP report and summary, 2023), and Step 4: Act.

3.5.1 PESTICIDE IMPACT REDUCTION TARGET SETTING

Target setting for Pesticide Impact Reduction targets follows a similar process as Nutrient Freshwater Quality targets (Section 3.4). After establishing baseline values (total baseline ecotoxicity impact, Section 3.2.5) for all baseline units within a given basin, companies must:

1. **Determine the required basin-wide reduction percentage**—calculated from the local resource where a local approach was selected, or taken from the fallback approach otherwise;
2. Allocate the reduction to the company; and
3. Define company-specific targets

Ideally, pesticide targets would be based on absolute protective thresholds in water bodies that account for the combined effects of multiple chemicals. As explained in Box 17, however, SBTN does not recommend setting pesticide reduction targets on a per-substance basis and instead applies an overall pesticide impact reduction approach. At present, Pesticide Impact Reduction targets are expressed as relative reductions from a baseline value. This reflects the following methodological and data limitations:

- Challenges in attributing impacts to individual sources and actors;
- The complexity of mixture toxicity;

- Limited background concentration data;
- Incomplete basin-wide chemical risk or impact assessments.

Using local approaches allows for a more direct alignment with local protective thresholds than the pesticide fallback approach.

Box 17: Why SBTN does not suggest per-pesticide reduction targets

Pesticide Impact Reduction targets differ from nutrient load reduction targets in that they do not ask for companies to set substance-specific targets (i.e., nitrogen or phosphorus) and go beyond environmental concentrations. This decision was taken for the following reasons:

- Reducing the usage of single pesticides below recommended doses would potentially make them ineffective. Instead, companies with pesticide usage in their value chain are advised to adhere to best practices to minimize pesticide emissions and related impacts (see Section 3.5.).
- Pesticide concentrations have a high temporal and spatial variability (e.g., growing different crops in the considered time frame might require the use of different pesticides from year to year), which would make the derivation of specific reduction percentages challenging.
- Pest management should aim to tackle pests at the system level beyond just replacing one insecticide with another one. Cessation of single pesticides might lead to regrettable substitution if the overall potential impact across all applied pesticides is not considered.

The Pesticide Impact Reduction targets build on the ambition of target 7b of the Global Biodiversity Framework (GBF)—i.e., to reduce pollution to levels that are not harmful to biodiversity—and are intended to set companies on the right path for pesticide impact reduction. The current aim is to reduce impact levels to at least 50% of the baseline value while incentivizing companies to set more ambitious targets, given the current impacts on water quality and aquatic life caused by cumulative effects in water systems. As target 7b of the GBF states, the aim is to:

> *"Reduce pollution risks and the negative impact of pollution from all sources by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: […] (b) by reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management, based on science, taking into account food security and livelihoods […]."*

The Pesticide Impact Reduction target can be derived through the following approaches, as described in Step 3a:

- *Local approach—Direct application*: local models, data, frameworks, and/or mixture-toxicity tools are used, with subject-matter experts, to refine a company-specific reduction.
- *Local approach—Back-calculation*: local mixture-toxicity assessments based on measured or predicted local concentrations are used to calculate the required basin-

wide reduction.

- *Local approach—Government-established environmental objective*: used directly where they meet SBTN criteria, or combined with the options above.
- *Pesticide fallback approach*: a reduction of at least 50%, in line with the GBF, where no local approach is feasible.

Chemical footprint tools (see Step 3b) enable companies to prioritize the phase-out, reduction, or substitution of pesticides based on their freshwater ecotoxicity impact, and to compare different pesticide use scenarios. Some tools also cover additional impacts[11].

Rec. 11—Application of local approaches for pesticides

> If appropriate local resources exist based on 3a, companies are strongly encouraged to use them to define a required basin-wide reduction percentage and allocate it to their baseline value. Otherwise, companies set targets using the pesticide fallback approach. This is not a requirement, and so companies can move forward even if the required subject matter expertise for applying local approaches is not in place.

Task 6. Apply an approach for the basin and calculate required basin-wide pressure reductions

3.5.1.1 Direct application of local models or methods

To allow for integration into local frameworks, direct application for pesticides provides more flexibility to derive a company-specific target compared with the guidance on Nutrient Water Quality. Direct application can take two forms:

1. *Applying local models and connecting to local pesticide impact reduction frameworks and government-established objectives:* This option builds on the direct application approach from setting nutrient targets in Section 3.4.1. Models, tools, and methods can be used to further refine a company's Pesticide Impact Reduction target in cases where local approaches are available to be applied for purposes of evaluating specific reduction scenarios. Hydrological and contaminant fate models and thresholds must follow the criteria outlined in Appendix B. Support from subject-matter experts is required for setting targets with this approach.
2. *Applying tools and methods to calculate mixture toxicity across chemicals:* Generic tools and methods are available to translate locally measured or modeled concentrations into mixture toxicity or chemical risk or impact metrics (e.g., Key Factor Toxicity; the Pesticide Risk Metric Calculator described in Neelamraju et al., 2025). These tools are based on species sensitivity distributions (SSDs). They use locally measured or predicted concentrations to estimate the multi-substance potentially affected fraction (PAF) of species, based on the combined toxicity of multiple pesticides. The PAF is the share of species potentially affected. Subtracting it from 100% gives the share protected. Tools must meet the threshold criteria in Appendix B. Applying these tools requires additional decisions about data handling (e.g., how to aggregate inputs or select among data sources) and water-quality and ecotoxicity expertise.

[11] However, these tools should not be used on their own for the purposes of defining actions and tracking a Pesticide Impact Reduction target (see Box 16 on acting on pesticides and Step 4).

Req. 63—Application of the local approach: Direct application of local models or methods

When following the local approach on direct application of models or methods, companies *must*:

- Show support from water quality and ecotoxicity subject matter experts.
- Provide documentation of the methodology applied to derive the required basin-wide reduction percentage and/or company-specific reduction required, including technical documentation of the models and/or tools and justification of the choice of data sources. The methodology must be documented in sufficient detail to enable independent replication of the analysis and results.
- Document the methodology used to derive the required basin-wide and/or company-specific reduction, including technical documentation of the models or tools and the choice of data sources, in enough detail to allow independent replication.
- Hydrological and contaminant fate models, and thresholds (also the thresholds incorporated in tools) must follow the criteria outlined in Appendix B (also see 3a).

3.5.1.2 Back-calculation from existing results

This option builds on the back-calculation approach for setting nutrient targets described in Section 3.4.1 but uses local chemical risk or impact assessments as a basis—either an assessment on pesticides alone, or one that includes both pesticides and other chemicals. It uses the results from Step 3b to form the company's potential ecotoxicity impact and combines this impact with local chemical risk or impact assessments (based on measured or predicted concentrations) to approximate the local reduction needed. For example, in areas with high risks, a reduction greater than 50% might be needed, whereas for areas with medium risks, a reduction of less than 50% might already be sufficient. Ideally, this information should be connected to the specific contribution of a company to the overall level of risk (see Appendix E on the absolute environmental sustainability assessment [AESA]). However, these data cannot yet be defined due to the lack of related assessment methodologies (see Section 3.5.1.1, as direct application of models and methods may provide a closer approximation).

In this guidance version, local chemical risk and impact assessments (i.e., mixture toxicity assessments) serve as an approximation of chemical basin impact and required reductions and subsequent company-specific pesticide impact reductions.

For deriving a basin-wide reduction percentage through back-calculation, the following information is required:

- Local predicted (modeled) or measured concentrations of pesticides (and potentially other chemicals) expressed in chemical risk or impact (see mixture toxicity or Appendix A on PAF and multi-substance PAF [msPAF]).
- Defined "safe" benchmark, for example, "no" or "negligible/low" risk, or 95% or 99% of species protected based on msPAF (using NOEC or EC10, and ideally chronic data). These benchmarks incorporate thresholds for several pesticides or chemicals.
- Additionally, most types of pesticides used locally should be included in the assessment.

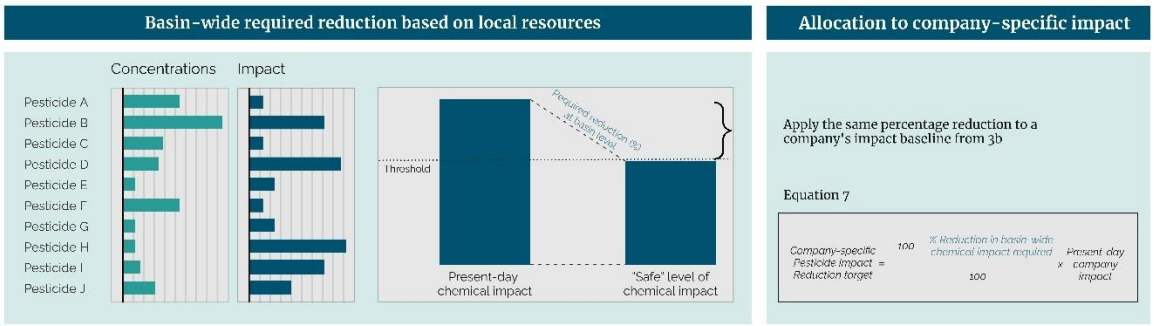


Figure 13: Conceptual overview of company Pesticide Impact Reduction targets based on required basin-wide chemical impact reduction. Chemicals have varying contributions to the overall impact or risk, depending on, e.g., their persistence and impact potency.

The required basin-wide chemical impact percentage reduction must be calculated based on the measured or estimated impact values and "safe" benchmark value as shown in Equation 6 (see also Figure 13):

Equation 6

$$\%\ \text{Reduction in basin-wide chemical impact required} = \frac{\text{Current basin-wide chemical impact level} - \text{"Safe" basin-wide chemical impact level}}{\text{Current basin-wide chemical impact level}} \times 100$$

Local (freshwater ecotoxicity) chemical risk or impact results and required reductions will be available at different temporal and spatial resolutions, depending on the method chosen and aim of the assessment. Equation 6 is applied on the temporal basis required for back-calculation (Section 3.1.1).

Because local chemical risk and impact results vary spatially and temporally, a different aggregation may be applied where the structure of the underlying data makes the default inappropriate. The conditions for doing so, and the circumstances in which subject-matter expert support is required, are set out in Section 3.1.1 Req. 11—Subject-matter expert support for back-calculation.

The company-specific Pesticide Impact Reduction target must then be defined by applying the same percentage reduction to the current company impact as shown in Equation 7:

Equation 7

$$\text{Company-specific Pesticide Impact Reduction target} = \frac{100 - \%\ \text{Reduction in basin-wide chemical impact required}}{100} \times \text{Present-day company impact}$$

The target unit is based on the output of the selected chemical footprint tool. This assumes the same "equal contraction of efforts" allocation approach as described earlier for freshwater quantity in Section 3.3.2 while describing reductions at an impact level.

Req. 64—Application of the local approach: Back-calculation from existing results

When following the local approach on back-calculation, companies must:

- Provide documentation of the methodology applied to derive the required basin-wide reduction percentage and justification of the choice of data sources.
- Show that the required basin-wide chemical impact reduction is based on local assessments (based on model results, or monitoring data and with integrated thresholds). Additionally, most types of pesticides used locally should be included in the assessment.
- Show that those assessments have a defined "safe" benchmark, for example, "no" or "negligible/low" risk, or 95% or 99% of species protected based on msPAF (using NOEC or EC10, and ideally chronic data).
- Apply Equation 6 to calculate the required basin-wide chemical impact percentage reduction from the measured or estimated impact values and "safe" benchmark value, **on the temporal basis required for back-calculation (Section 3.1.1)**. A different aggregation may be applied only under the conditions in Section 3.1.1.
- Apply Equation 7 to calculate the company-specific Pesticide Impact Reduction target.

3.5.1.3 Alignment with government-established environmental objectives

Where suitable government-established environmental objectives are identified (see Section 3.1), companies may use them to define the maximum allowable basin-wide or company-specific pesticide usage or impact reduction.

Compared with surface water, groundwater, and nutrients, it is less likely that such a framework will provide a directly applicable maximum allowable pesticide usage or impact.

Where this pathway is used, the requirements in Req. 49—Application of government-established environmental objectives (Section 3.3.1) apply.

3.5.1.4 Pesticide fallback approach

If direct application and back-calculation based on local information and stakeholder support are not feasible, companies must set a target of at least 50% potential impact reduction in line with the GBF as a fallback solution based on their total baseline ecotoxicity impact defined in Step 3b.

Req. 65—Application of the pesticide fallback approach

When companies are not following a local approach to set Pesticide Impact Reduction targets, companies must apply the fallback approach and set a target of at least 50% potential impact reduction in line with the GBF as a fallback solution based on their total baseline ecotoxicity impact defined in Step 3b.

Rec. 12—Application of the pesticide fallback approach: Ambition increase

Companies should set a more ambitious reduction target where local evidence (See Step 3a) indicates:

- Threshold exceedances of pesticides used by a company are identified and/or pesticides us3.ed by a company are identified by the selected data source as the (temporary) main contributors to local mixture toxicity, basin priority pollutants, or top exceeding substances. Companies should take action on those priority substances in particular;
- Local information does not allow for back-calculation, but the basin is referred to

as having a high chemical- or pesticide-related risk or impact; and/or
- The location has high nutrient and pesticide pollution, and the local ecosystem is therefore experiencing multiple stresses.

3.5.1.5 Time step for Pesticide Impact Reduction targets

Req. 66—Time step for Pesticide Impact Reduction targets

Companies must mirror the approach taken for the baseline data collection (i.e., yearly values).

However, if local tools and frameworks (see Section 3.5.1.1) allow targets to be defined on a finer resolution, a different approach may be chosen (e.g., seasonal or monthly). This must be done in consultation with subject-matter experts, with the primary aim of addressing temporal pesticide concentration or impact peaks where relevant.

3.5.1.6 Template statement for Pesticide Impact Reduction targets

Req. 67—Target time frame for Pesticide Impact Reduction targets

For Pesticide Impact Reduction targets, companies must submit their targets with a target year of five years from the date of target submission.
Or
With adequate justification, submitted for validation, the target year *may* be up to ten years. The justification *must* show that the later date:

1. Aligns with the time frame of global societal or policy goals (e.g., the Global Biodiversity Framework or the UN Sustainable Development Goals);
2. Aligns with the time frame of local or regional government-established objectives, policy goals, or voluntary goals; or
3. Is supported by documented stakeholder engagement or other tangible actions critical to achieving the target in that basin.

Box 18: Template statements for Pesticide Impact Reduction targets

> "[Company X] will reduce its pesticide impact in the [basin name] basin to [X] [pesticide impact metric]/ year by the year [X]."

The following information will be shared publicly as supplementary information on the target:

- The chemical footprint tool (including version) used for calculating the potential ecotoxicity impact;
- The pesticide usage data representation level;
- The percentage (%) of pesticide usage for which impact has not been quantified.

3.5.2 HIGHLY HAZARDOUS PESTICIDES CESSATION TARGETS

Task 7. Set company Freshwater Quantity and Quality targets

To complement the Pesticide Impact Reduction target, the HHPs Cessation target supports

the execution of target A7 of the Global Framework on Chemicals (GFC), outlined below:

> *"By 2035, stakeholders have taken effective measures to phase out highly hazardous pesticides in agriculture where the risks have not been managed and where safer and affordable alternatives are available, and to promote transition to and make available those alternatives."*

By including a cessation target on HHPs, this guidance follows a precautionary approach that goes beyond the freshwater realm. It does not allow for risks to be managed.

The HHPs Cessation target covers all pesticides identified in Section 3.2.5. For those pesticides, companies commit to phasing out at least half of their HHPs by 2030 and all of them by 2035. Temporary exemptions may be granted where a company provides justifying evidence (see Req. 68). Temporary exemptions are possible to account for protecting local livelihoods and food security.

Req. 68 — HHPs Temporary Exemption

For each Highly Hazardous Pesticide for which a temporary exemption is requested, companies must:

- Provide adequate evidence and justification per HHP that phase-out until 2035 would cause substantial harm to local livelihoods and/or food security;
- Submit an exit plan: Companies must provide a time-bound plan describing the actions and alternative pest management approaches that will be pursued to eliminate use of the HHP;
- Re-evaluate each exemption at least annually. Exemptions are valid for one year only and must be reassessed based on updated evidence;
- Calculate which % of the potential impact the specific HHP represents in the basin (for companies with pesticide usage in their value chain). The PIQ Tool can be used for this calculation; and
- Calculate which % of HHP mass produced/traded the specific HHP represents in the business unit or at company level (for companies producing and trading HHPs).

Exemptions will not be granted for locally prohibited pesticides. Likewise, in line with the Rainforest Alliance, exemptions will not be granted for paraquat, fipronil, and pesticides that are on the prohibited list of the Rotterdam Convention, Stockholm Convention, or Montreal Protocol classification.

If an exemption is granted, companies with pesticide usage in their value chain must[12] set a Pesticide Landscape Engagement target to act on reducing pesticide freshwater impacts and address enabling the cessation of the specific HHP (Case 3 in Req. 5 — Applicability conditions of Pesticide Landscape Engagement target).

While targets for companies with pesticide usage in their value chain are set on a basin level to ensure sufficient traceability and connection with suppliers to act on the target,

[12] Companies must set a Pesticide Landscape Engagement target unless a target has already been set based on the five cases outlined in Req. 5 — Applicability conditions of Pesticide Landscape Engagement target. If this is the case, companies should set a Pesticide Landscape Engagement target but are not required to.

companies are encouraged to address the cessation of HHPs across the value chain, beyond priority basins.

Template statement for HHPs Cessation targets for companies with pesticide usage in their value chain

Req. 69—Target time frame for HHPs Cessation targets for companies with pesticide usage in their value chain:

> For HHPs Cessation targets companies must submit their targets in line with target 7b of the Global Biodiversity Framework (2030) and target A7 of the Global Framework on Chemicals (2035),

Box 19: Template statements for HHPs Cessation targets for companies with pesticide usage in their value chain

Targets without temporary exemptions: "By 2030, [Company X] will stop the usage and application of at least half[13] of its highly hazardous pesticides (HHPs), and stop the usage and application of all HHPs by 2035 in basin _____."

Targets with temporary exemptions: "By 2030, [Company X] will stop the usage and application of at least half[13] of its highly hazardous pesticides (HHPs), and stop the usage and application of all HHPs by 2035 in basin _____, with a temporary exception of _____ (representing _____% of potential impact)."

The following information will be shared publicly as supplementary information on the target:

- The number of HHPs currently excluded
- The percentage of potential impact currently excluded
- The versions of the PAN lists used.

Template statement for HHPs Cessation targets for pesticide producers and traders

Req. 70—Target time frame for HHPs Cessation targets for pesticide producers and traders

> For HHPs Cessation Impact targets, companies must submit their targets in line with target 7b of the Global Biodiversity Framework (2030) and target A7 of the Global Framework on Chemicals (2035)

Box 20: Template statements for HHPs Cessation targets for pesticide producers and traders

Targets without temporary exemptions: "By 2030, [Company X] will stop the production/trade of at least half[13] of its highly hazardous pesticides (HHPs) and stop the production/trade of all HHPs by 2035."

Targets with temporary exemptions: "By 2030, [Company X] will stop the production/trade of at least half[13] of its highly hazardous pesticides (HHPs) and stop the

[13] For companies with pesticide usage in their supply chain, "at least half" refers to total pesticide usage in their value chain if the amount can be estimated and (estimated) number of substances that are used otherwise. For pesticide producers and traders, it refers to mass produced or traded.

production/trade of all HHPs by 2035 with a temporary exception of _____ (representing _____% of HHP mass produced/traded)."

The following information will be shared publicly as supplementary information on the target:

- The number of HHPs currently excluded
- The percentage of total HHP mass that Company [X] currently produces or trades but that it currently excludes from its target
- The versions of the PAN lists used.

3.5.3 PESTICIDE LANDSCAPE ENGAGEMENT TARGETS

Task 7. Set company Freshwater Quantity and Quality targets

What is a Pesticide Landscape Engagement target?

The Pesticide Landscape Engagement target requires companies to engage at the landscape (e.g., basin) level to reduce pesticide impacts through system-wide changes in agricultural practices. This guidance is adapted from SBTN's Land target 3 on Landscape Engagement, with adjustments specific to pesticide-related freshwater impacts. The target recognizes that avoiding or reducing pesticide use is not always possible without a more systemic understanding and transformation of agricultural practices and local circumstances. The prevailing approach is to work at the landscape scale to understand landscape conditions, constraints, and trajectories. This approach is based on a theory of change designed to achieve a safe and just future for humanity in nature. Like the Landscape Engagement target outlined in the Land guidance, the Pesticide Landscape Engagement target allows for the consideration of multiple objectives from multiple stakeholders, including nature, and therefore enables a better incorporation of potential synergies and trade-offs.

The Pesticide Landscape Engagement target differs from SBTN Land guidance for Landscape Engagement targets, in terms of the following aspects:

- The selection of landscapes needs to be based on pesticide freshwater impacts and pesticide freshwater pollution The applicability, minimum coverage and landscape-selection requirements for Pesticide Landscape Engagement targets are defined in Req. 5—Applicability conditions of Pesticide Landscape Engagement targets (see Section 1.4). Req. 5 replaces Land Requirements T3.1 and T3.2 for the purposes of a Pesticide Landscape Engagement target.
- The selection of metrics must be related to pesticide freshwater impact reduction (see Box 21), and ecological thresholds related to pesticides should be taken into account (Req. 71—Commitment to substantial improvement).
- The Landscape Initiative Roadmap for Pesticide Landscape Engagement targets *must* describe how the initiative will contribute to and enable reduced reliance on Highly Hazardous Pesticides (HHPs) within the target landscape (Req. 76—Landscape Initiative Roadmap and HHPs).

Box 21: Baselining for ecological and social conditions.

SBTN acknowledges the variety of indicators, metrics, and indexes that can be used to assess ecological and social conditions in landscapes (see Table 15, "List of potential metrics for ecological and social conditions," in SBTN's Land guidance). Companies setting a Landscape Engagement target should therefore assess and select an appropriate set of metrics based on the needs of specific locations. Companies should therefore be able to define and select local metrics to report on key issues in their local context.

Examples of metrics for pesticide freshwater impacts include the following:

- Pesticide usage, toxicity-weighted pesticide usage, and pesticide-related potential ecotoxicity impacts (e.g., total annual ecotoxicity impact obtained with SBTN's PIQ Tool).
- Pesticide concentrations in freshwater
- Ecological thresholds and local water quality standards (see Appendix A) and (number/amount of) transgressions
- Mixture toxicity or pesticide risk metrics (e.g., msPAF).

See Box 3 on Queensland for a local example.

These metrics, including ecological thresholds, can be used to shape ambition and prioritize landscape initiatives.

The remaining guidance elements follow the process outlined in SBTN's Land guidance, with minor deviations to adapt to the water and pesticide context. Companies that have already committed to or are working on Landscape Engagement targets can decide to expand on their targets by integrating pesticide-related metrics if the landscape is considered material regarding freshwater pesticide impacts (see Req. 5—Applicability conditions of Pesticide Landscape Engagement target). Requirements from the Land guidance that apply to Pesticide Landscape Engagement targets are explicitly called out below. Additionally, companies are encouraged to follow the other recommendations outlined in the Land guidance.

The Landscape Engagement target is broad by design and encompasses a variety of potential actions that companies and other stakeholders can implement to achieve holistic, multi-objective environmental, biodiversity, and social outcomes. In contrast to the Land Landscape Engagement target, the primary objective of the Pesticide Landscape Engagement target is to reduce pesticide impacts on freshwater ecosystems. It achieves this by increasing resilience against pests and exploring alternative pest management methods, while recognizing opportunities for broader multi-benefits for nature and people.

Req. 71 [build on Land V2 guidance: Req. T3.4]—Commitment to substantial improvement

Companies must commit to a substantial improvement in ecological and social conditions through selected metrics for the target landscape(s).

This substantial improvement must include metrics on pesticide freshwater impacts (see Box 21) and it is recommended to take ecological thresholds for freshwater related to pesticides into account.

Req. 72 [Land V2 guidance: Req. T3.5]—Target duration for Landscape Engagement

The Landscape Engagement target must span a minimum of five years and a maximum

of ten years from the date the target is submitted to SBTN for official validation.

Social, human, and land rights

Req. 73 [Land V2 guidance: Req. T3.6]—Social and environmental safeguards

All actions proposed within a landscape initiative must uphold and respect the rights of Indigenous Peoples and Local Communities (IPLC) and other affected stakeholders.

Companies must:

- Respect the rights of Indigenous Peoples to self determination including the righ to free, prior, and informed consent;
- Move beyond surface-level approaches to develop meaningful engagement with stakeholders;
- Aim to ensure that engagement is inclusive, equitable, and incorporates those stakeholders most impacted by economic activities or the landscape initiative.

Companies must include a preliminary assessment of the potential consequences of their proposed actions in their target documentation, identifying any potential negative or unintended impacts on people and the environment. Where unacceptable outcomes are identified, steps must be taken to avoid or mitigate them. Section 3.5 outlines pesticide-specific considerations.

SBTN recognizes that ambitious freshwater targets may bring risks of limiting vulnerable producers' and smallholders' opportunities to benefit from corporate supply chains and associated resources. Engagement within a multi-stakeholder process exposes companies to stakeholders who may more clearly see such risks (see ISEAL, 2026; Proforest, 2023). Companies should be able to clearly communicate any trade-offs and the steps taken to avoid or mitigate unacceptable outcomes (see SBTN's Stakeholder Engagement Guidance).

How to set Pesticide Landscape Engagement targets

1. Selection of material landscapes (basins)

Please refer to Req. 5—Applicability conditions of Pesticide Landscape Engagement targets in Section 1.4.

Prioritizing basins in which cases 1 to 5 occur for setting Pesticide Landscape Engagement targets is meant to ensure that targets are set where engagement is required most. Moreover, companies may set Pesticide Landscape Engagement targets in additional priority basins. Engaging in landscape initiatives constitutes a positive contribution to the transformation needed in our economic systems and the way that these systems interact with the people and places in which they operate. These initiatives can also generate benefits for the company.

2. Assessing landscape initiative readiness

Once companies have selected material landscapes, they must assess whether the landscape initiatives they have identified, or plan to establish, are sufficiently credible and well-governed to deliver lasting sustainability outcomes. This assessment is based on four key criteria (Land guidance Section 3.2.2), which are also the basis for the landscape engagement roadmap requirements in the Land guidance section 3.2.3 and the validation submission:

- Criterion 1: Scale

- Criterion 2: Multi-stakeholder governance process or platform
- Criterion 3: Collective goals and actions
- Criterion 4: Transparent reporting

Req. 74 [Land V2 guidance: Req. T3.3]—Evaluation against key criteria

Companies must evaluate prioritized landscape against the four key criteria for validated landscape initiatives. For details on the scenarios, refer to the Land V2 guidance section 3.2.2.

Req. 75 [Land V2 guidance: Req. T3.7]—Self-assessment and scenario determination

Companies must complete a binary self-assessment of whether their selected landscape initiative(s) fulfill each of the four key criteria. The outcome determines the applicable engagement scenario and the corresponding roadmap requirements. Validators will require evidence that this self-assessment has been completed. For details on the scenarios, refer to the Land V2 guidance Section 3.2.3.

3. Developing a Landscape engagement roadmap

Req. 76 [build on Land V2 guidance: Req. T3.8]—Landscape Initiative Roadmap and HHPs

Companies must prepare the Landscape Initiative Roadmap and an action plan for engagement in the selected landscape(s) as a formal document to facilitate implementation and enable future audits. It must be submitted during target validation. SBTN validators (the Accountability Accelerator) will check the completeness of all items.

The roadmap is not intended to evaluate evidence against the completion of all requirements as the target is set, but must instead demonstrate the intent to achieve roadmap requirements by the target date. The documentation requirements vary by scenario, as determined by the self-assessment in section 3.2.2 of the V2 Land Methods.

The Landscape Initiative Roadmap for Pesticide Landscape Engagement targets must describe how the initiative will contribute to and enable reduced reliance on Highly Hazardous Pesticides (HHPs) within the target landscape.

Rec. 13—Addressing HHPs in the Landscape Initiative Roadmap

Companies are recommended to set out, within the roadmap, the actions through which the initiative will support reduced reliance on highly hazardous pesticides in the landscape, and how progress towards this will be tracked. Guidance on reducing risk when phasing out pesticides is available from FAO and WHO (2025).

For companies already investing in landscape initiatives, landscape engagement may provide a simplified, integrated framework for quantifying and recognizing such contributions. Actions taken in landscapes that are not materially relevant to a company cannot satisfy the requirements of the Landscape Engagement target. Additional guidance from ISEAL clarifies that a landscape investment or action that could be recognized by SBTN must:

- Address critical sustainability issues in the landscape and contribute to agreed

landscape goals.

- Aim to have impacts beyond individual supply chains.
- Include support to multi-stakeholder landscape coordination processes.
- Be embedded in collective action plans, ensuring complementarity with other activities and interventions in the landscape.
- Contribute to broader systems-level change, helping to create the enabling conditions for achieving the agreed landscape goals.

Companies already involved in selected landscape initiatives must therefore demonstrate both the materiality and quality of those initiatives, as well as the integration of at least one metric related to freshwater pesticide impacts.

Rec. 14—Monitoring and assistance

> We recommend that companies consider opportunities to improve data availability, for example through pesticide usage tracking and local monitoring, providing agronomic and technical assistance to producers, and other complementary efforts that further advance the state of knowledge and action in the basin. These activities will position the company and basin for further target-setting action.

When landscape initiatives are not present in any of the prioritized locations, or they do not meet the key criteria, companies can rely on their roadmap documentation showing the planned steps to meet the criteria, or they can develop new landscape initiatives (see Land guidance section 3.2.4).

Please refer to the scenarios and the documentation required for each roadmap item outlined in the Land guidance Section 3.2.3.

4. Submit Pesticide Landscape Engagement target for validation

To begin the target validation process, companies must submit the following to SBTN:

1. International Standard Industrial Classification (ISIC) sector classification(s) that describe their direct operations and upstream activities.
2. Descriptive rationale of how pesticide freshwater impacts will be considered in the initiative.
3. Descriptive rationale for the process chosen for selecting priority landscapes, including the case used with justification (Req. 5—Applicability conditions of Pesticide Landscape Engagement targets).
4. Results of the self-assessment of landscape initiative readiness against the four key criteria (Land guidance section 3.2.2), confirming the applicable scenario (Scenario 1, 2, or 3 as outlined by the Land guidance) and supported by evidence of the assessment process. Additionally, the landscape engagement roadmap prepared in accordance with the Land guidance section 3.2.3 and Table 10. As part of the roadmap, at least one metric for measuring and tracking progress must be related to freshwater pesticide impacts (see Box 21 above). The Landscape Initiative Roadmap for Pesticide Landscape Engagement targets must describe how the initiative will contribute to and enable reduced reliance on Highly Hazardous Pesticides (HHPs) within the target landscape.
5. Demonstrated engagement within an iterative process of stakeholder consultation, including relevant parties as needed.

6. Evidence that an adequate and impartial assessment of the needs of local communities has taken place within this stakeholder consultation.
7. Alignment of corporate actions with community needs and objectives that result from the stakeholder consultation process.

Once the target has been approved, companies can make a public statement, as outlined in the *SBTN Claims Guidance*.

Template statement for Pesticide Landscape Engagement targets

Box 22: Template statements for Pesticide Landscape Engagement targets.

Pesticide Landscape Engagement: "[Company X] is engaged in [initiative name and location] and committed to a substantial improvement in ecological and social conditions by [target date], including reducing pesticide impacts on freshwater ecosystems."

3.6 Next steps for companies with validated Freshwater targets

After setting their Freshwater science-based targets, companies should start implementation actions and track progress on their pressures relative to their baseline values. Further guidance on Step 4: Act and Step 5: Track is forthcoming. A preliminary list of response options for Step 4: Act is provided in SBTN's Response Options Database and in the SBTN initial guidance. The AWS Standard Version 3.0 is also a useful resource to support companies in creating and implementing water stewardship plans. The Standard also recognizes SBTN Freshwater targets as a complementary approach to informing site targets (AWS, 2026). Progress on the Freshwater targets will be counted toward future targets in the case of guidance revisions. Companies reporting under the Corporate Sustainability Reporting Directive (CSRD) can reuse their validated target statements in European Sustainability Reporting Standards (ESRS) target disclosures, including the baseline, basin scope, method documentation, and link to ecological thresholds (see this 2026 guide by the SBTN Freshwater Hub).

References

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Glossary

Authorized basin agency: National, regional, state, or local government agency that has the authority to make decisions on the allocation of water resources, including regulating pollutant loads. Examples include basin management authorities, water resource management agencies, and catchment councils.

Back-calculation: The process of determining the required percent reduction in basin-wide withdrawals, nutrient load, or pesticide potential impact by examining existing results from an approved local approach and environmental thresholds.

Baseline period: The five-year window ending with the most recent qualifying year at the time of submission. The baseline period is fixed at validation and does not move. Later years are reporting years. A baseline unit may have qualifying years for only part of the period (see Section 3.2.2).

Baseline unit: A production unit or sourcing location identified in Step 1b from which a basin baseline is built. For direct operations, this is the production unit—any geographically defined area under the company's operational control. Baseline values are established, and targets set and achieved, at basin level. Baseline units are the inputs to that basin figure (see Box 6).

Basin: The area of land that provides all surface runoff and subsurface waters to a given waterbody. Also referred to as a "watershed" or "catchment."

Basin management authority: The agency or authority within a basin that is officially designated for the management of the water resources, including decisions on freshwater quality standards and freshwater quantity allocations.

Blue water availability: Natural runoff (through groundwater and rivers) minus environmental flow requirements. Blue water availability typically varies within the year and from year to year.

Blue water footprint: Volume of surface and groundwater consumed as a result of the production of a good or service.

Catchment: The area of land that provides all surface runoff and subsurface waters to a given waterbody. Also referred to as a "watershed" or "basin."

Chemical footprint: Quantifies the potential environmental impacts associated with human toxicity and ecotoxicity related to chemical usage and chemical emissions along the life cycle of products, processes or organizations' activities. (Source: adapted from GFC, 2026). In this guidance, only part of a chemical footprint is quantified: potential freshwater ecotoxicity impact from direct pesticide application (see potential ecotoxicity impact).

Chemical footprint tool: In the context of this guidance, combines data and models related to pesticide usage, emissions, and impact potentials to link information on pesticide application to potential human toxicity and/or ecotoxicity impacts. Examples include SBTN's Pesticide Impact Quantification (PIQ) Tool and regionally calibrated local tools. Tools must meet the criteria in Appendix B.

Concentration: The amount of a substance in a given volume of water, specified in units of mass per volume (e.g., mg P/L).

Consumption: The net use of water, i.e., the volume of water withdrawn minus the volume of water discharged/returned, or the equivalent volume estimated directly using an established method (e.g., blue water footprint accounting).

Cumulative impacts: Impacts that result from incremental changes caused by other actions, along with the entity of interest. It may also refer to the cumulative pressures and cumulative impacts of chemical mixtures.

Desired state of nature (SoN): refers to the ecological condition society aims to achieve or maintain. Thresholds support, but do not define, the desired SoN.

Direct application: The process of determining the required percent reduction in basin-wide withdrawals, nutrient loads, or pesticide potential impact. It can also refer to applying tools and methods to calculate mixture toxicity across chemicals (i.e., integrating state of nature and thresholds).

Ecotoxicity: The extent to which contact with a chemical resulting from chemical usage and/or chemical emissions can lead to adverse effects on ecosystem organisms from cell to biodiversity level (Source: adapted from GFC, 2026). In this guidance, pesticide pressure is expressed as potential ecotoxicity impact—a relative, comparative indicator of potential harm rather than a prediction of environmental concentrations (in SBTN's Pesticide Impact Quantification (PIQ) Tool, expressed as Comparative Toxic Units for ecosystems per year (CTUe/year).

Environmental flows (e-flows): Environmental flows (e-flows) describe the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems, which, in turn, support human cultures, economies, sustainable livelihoods, and wellbeing.

Effluent: The outflow of water from a structure such as a wastewater treatment plant, sewer pipe, or industrial outfall.

Equal contraction of efforts: The allocation method by which a basin-wide required reduction is applied as the same percentage reduction to every water user in the basin. Each company applies the basin-wide percentage to its own baseline. The method requires only the company's own baseline and is not a judgment of responsibility for basin degradation (see Box 11).

Freshwater: Water containing less than 1,000 mg/L of dissolved solids, most often salt.

Global approach: An approach that uses an SBTN-approved global model and threshold to determine the basin-wide required reduction. SBTN has already approved these models for technical credibility, so companies need only demonstrate that the approach is contextually appropriate for the basin. Currently available for Freshwater Quantity and Nutrient Freshwater Quality only.

Gray water footprint: the volume of freshwater that is required to assimilate the load of pollutants based on natural background concentrations and existing ambient freshwater quality standards. It is calculated as the volume of water required to dilute pollutants to such an extent that the quality of the water remains above the agreed freshwater quality standards.

Highly hazardous pesticides (HHPs): "Pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions." In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous" (Source: FAO, 2014).

Impact scaling factor (also impact characterization factor): Factors either obtained from models or chemical characteristics (e.g., half-life) to approximate potential impact associated with chemical pressure (e.g., pesticide usage and subsequent emissions). A combination of factors might be needed to translate the chemical pressure into potential impact (e.g., factors characterizing chemical fate, distribution, and exposure, and [eco-] toxicological effect information). Please note that only when combining pesticide usage, emission, and impact scaling or characterization factors the output can contribute to a chemical footprint.

Local approach: An approach that uses local models, methods, thresholds, or government-

established environmental objectives to determine the basin-wide required reduction. Companies must demonstrate that the selected resources meet the criteria in Appendix B and are contextually appropriate for the basin.

Load: The rate at which a pollutant such as nutrients is delivered to a receiving water, specified in units of mass per time (e.g., kg P/day).

Local chemical impact or risk assessment: Assessments based on local data (e.g., water quality or biological monitoring) or models (and obtained predicted concentrations) that evaluate impacts or risks associated with chemical mixtures (see also "mixture toxicity") for aquatic ecosystems.

Mixture toxicity: The potential impact or risk of chemical mixtures in water on aquatic ecosystems. Alternative terms are "mixture pressure", "toxic mixture pressure", or "mixture risk". A common metric is msPAF. Assessments can either include a specific group of chemicals, e.g., pesticides, or chemicals from various groups. Also, mixture toxicity may be assessed based on pesticide category (e.g., insecticides) highlighting the type of pest that is driving the toxicity. Note that in the most common ways to derive mixture toxicity results, potential synergistic or antagonistic effects among the involved chemicals in the mixture are not considered; to include such effects, specific mixture assessment factors will need to be applied.

Nonpoint source: Sources of pollution that are delivered to the receiving water in a diffuse manner, i.e., not through a confined channel or discharge pipe.

Other priority basins: All basins that are considered material and have sufficient traceability, other than top-priority basins. Rankings may differ between water quantity and water quality, and companies must maintain separate rankings for validation.

Pesticide: A "chemical or biological ingredient intended for repelling, destroying or controlling any pest, or regulating plant growth." Pesticides are contained in a commercial plant protection product formulation as an active ingredient and have various subgroups (e.g., insecticides, herbicides, fungicides, and rodenticides) (Source: Adapted from FAO, 2014 and Scheringer & Schulz, 2025).

Pesticide fallback approach: An approach for setting Pesticide Impact Reduction targets where an appropriate local approach cannot be applied. This approach uses the company's potential ecotoxicity impact to set a reduction target against the company's own baseline and applies at least a 50% reduction based on Target 7b of the Global Biodiversity Framework.

Pesticide usage: The application of pesticides to control pests, or, in quantitative terms, the amount of pesticide active ingredient applied in a given time frame (e.g., total mass applied in one year for a specific baseline unit). Note that, depending on the context, pesticide usage may also be understood as the amount of plant protection product applied.

Pfafstetter Coding System: A hierarchical method of coding river basins such that Level 1 basins correspond to continental-scale basins draining to the ocean. Higher levels (Levels 2, 3, 4, etc.) represent ever-finer divisions of the landscape into smaller basins. HydroBASINS is rooted in the 'Pfafstetter' coding system, and has been implemented in the HydroBASINS product offering 12 hierarchically nested sub-basin breakdowns globally.

Plant protection product: A commercial "formulated product (includes pesticide active ingredient(s) and co-formulants), in the form in which it is packaged and sold" (Source: Adapted from FAO, 2014).

Point source: Any single identifiable source of pollution from which pollutants are discharged, such as a confined channel or discharge pipe.

Potential ecotoxicity impact: Potential biological harm on ecosystems via ecotoxicological mechanisms associated with exposure following chemical usage and emissions (Source:

adapted from GFC, 2026). In this guidance, potential ecotoxicity impact is calculated by combining pesticide usage with subsequent emissions and ecotoxicity (impact) characterization factors. It covers freshwater ecotoxicity impacts and may include impacts on complementary aspects (e.g., terrestrial ecosystems).

Qualifying year: A calendar or reporting year in which a baseline unit has complete activity data and applicable pressure data. Pressure data may be measured, estimated, or derived from a pressure factor. "Qualifying" means complete, not high quality.

Rights holder: An individual or group holding legal or customary rights that may be affected by a company's freshwater pressures, including rights to water, land, territory, subsistence, or cultural practice (for example, local communities and Indigenous Peoples or their representatives). Rights holders hold entitlements rather than interests, and the obligation to respect those rights applies whether or not they are consulted. For approach selection, rights holders form one of three stakeholder categories (see Stakeholder).

"Safe" benchmark: For pesticides, the level of protection defining an acceptable chemical impact or risk in a mixture toxicity assessment—for example "no" or "negligible/low" risk, or protection of 95% or 99% of species based on msPAF (using NOEC or EC10, and ideally chronic data). A benchmark incorporates thresholds for several pesticides or chemicals combined, and so differs from a threshold for a single substance.

Spatial scale: The geographic area over which freshwater pressures, state indicators, thresholds, and targets are assessed and applied. In this guidance, the spatial scale typically corresponds to a hydrological unit (e.g., basin, sub-basin, or catchment), but may vary depending on the selected approach, data availability, and pressure type. It determines where pressures are summed, where thresholds are evaluated, and how basin-wide reduction requirements are translated into company-specific targets.

Spatial resolution: The fineness of the spatial units used by a model, dataset, or monitoring network. A resource may have a finer resolution than the basin selected in Step 2: Interpret & Prioritize (for example, Level 6 sub-basins within a Level 5 basin).

Stakeholder: For approach selection under Step 3a, an organization, institution, or group with expertise in, authority over, or a direct interest in freshwater conditions in a basin where a company sets targets, falling into one or more of three categories: authoritative, technical, or contextual/rights holder (see Appendix B). Stakeholders are consulted on whether a selected approach is contextually appropriate for the basin. They are not expected to validate technical methods or endorse a company's targets. Consultation under this guidance is distinct from the broader process described in SBTN's Stakeholder Engagement Guidance.

Subject-matter expert (SME): An individual with demonstrable technical qualification in a discipline relevant to applying or interpreting a freshwater approach (for example: hydrology, hydrogeology, water quality, ecotoxicology, or ecohydrology). An SME may be employed by, contracted by, or external to the company; and their affiliation, qualification, and any commercial relationship must be disclosed at validation. SME input is methodological and does not substitute for stakeholder consultation; the company remains responsible for the resulting assessment.

Threshold: boundary value of an environmental indicator beyond which ecological conditions begin to shift away from the desired state of nature.

Top-priority basins: The top 10% of basins based on the Step 2a or 2b ranking results, or the top 10 basins where more than 100 basins are considered material and have sufficient traceability. A basin may be top priority for water quality but not for quantity.

Water challenge: Water-related issues including physical water scarcity, insufficient freshwater quality, and/or regulatory restrictions on water use.

Water use: A general term that can represent either gross withdrawals or net consumption

(i.e., water withdrawn minus the volume of water discharged/returned, or the equivalent volume estimated directly).

Watershed: The area of land that provides all surface runoff and subsurface waters to a given waterbody. Also referred to as a “basin” or "catchment."

Withdrawal: The volume of water abstracted from surface water or groundwater, before any deduction for water discharged or returned. Also referred to as gross withdrawals where the distinction from consumption matters.

Abbreviations

AESA: absolute environmental sustainability assessment

BTT: Basin Threshold Tool

CTUe: Comparative Toxic Units for ecosystems

EC: effect concentration

EQS: environmental quality standard

GBF: Global Biodiversity Framework

HHPs: highly hazardous pesticides

IPM: integrated pest management

MAR: managed aquifer recharge

MRV: monitoring, reporting, and verification

msPAF: multi-substance potentially affected fraction of species

NOEC: no observed effect concentration

PAF: potentially affected fraction of species

PIQ*:* Pesticide Impact Quantification tool

PNEC: predicted no effect concentration

PPP: plant protection product

SSDs: species sensitivity distributions

Validation requirements and recommendations

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Appendix A: Chemical water quality standards and thresholds

Water quality standards (also referred to as predicted no-effect concentrations, regulatory threshold values, or environmental quality standards [EQSs]) for single chemicals and their derivations differ globally. These standards set the level of "Acceptable risk" (i.e., so-called "safe" or "protective" levels) for chemical concentrations.

Potential approaches include the following:

- *Species sensitivity distribution (SSD) method:* This method focuses on direct ecotoxicological effects on aquatic organisms. The SSD method uses substance-specific ecotoxicity data from several species and fits them to a statistical model (e.g., log-normal or log-logistic). Depending on the type of effect data used (e.g., chronic no observed effect concentration [NOEC] or acute EC50 [concentration that affects 50% of test species for a given effect] values), the interpretation of an SSD, in terms of the expected magnitude of impacts on the exposed species assemblages, will differ (Posthuma et al., 2019). That is, a NOEC-based mixture toxicity estimates the fraction of species being exposed beyond their no-effect level, which in the lower range can be read as 'nuisance'. However, an EC50-based mixture toxicity characterizes substantial impacts, with 50% reduction of e.g., reproductive output, and estimates the fraction of species seriously affected; in calibration studies, the latter estimates covary with species loss (see Dutch Key Factor Toxicity Tool). Based on the former, a Predicted No Effect Concentration (PNEC) that protects a certain percentage of species (e.g., 95% or 99%) is calculated. Inversely, a specific concentration can be linked to a potentially affected fraction of species (PAF). The use of SSDs is often limited by the lack of ecotoxicological effect data (Posthuma et al., 2019). In addition to experiments (*in vivo*), ecotoxicity effect data might be approximated through bioassays (*in vitro*) or modeling (*in silico*) (Bub et al, 2025). Current research, however, aims to bridge this data gap via machine learning and artificial intelligence modeling.

- *Assessment factor method:* This method is used to set regulatory protective standards, and the magnitude of the assessment factor reflects the degree of scientific uncertainty in the available hazard data for distinct protection goals (for human health, direct ecological effects, or food chain-mediated effects). By applying an assessment factor, the regulatory approaches aim to ascertain sufficient protection under uncertainty in hazard data. Hence, this method is most commonly used, due to reduced data requirements, for example, regarding effect data (Norman Network, 2022). Moreover, additional assessment factors to account for differences in effects, species sensitivity, mode of action, and potentially other aspects are combined with PNECs. These factors differ based on data quality for each effect test result and can range from a factor of 3 to a factor of >1000, aiming to ensure that, for each chemical, the reference concentration is conservative and, with that, sufficiently protective (see details, e.g., Government of Canada, 2025). The final regulatory PNEC

is thus adopted, ascertaining sufficient protection for all three protection targets under uncertainty.

- *Limit of detection*: Whenever standards cannot be defined based on effect information, or where effect concentrations are below technically measurable levels, environmental quality methods might be defined based on detection limits. In these cases, "safe" concentrations might fall below analytical detection limits (Bub et al., 2025).

- *Default or precautionary:* In certain jurisdictions, like in the European Union (EU), precautionary water quality standards are set for every pesticide (e.g., 0.1 µg/L for groundwater).

The specifics of the method or combinations thereof used can differ between local regulations (e.g., effect data quality standards, specific calculation steps, intended water use, and potentially accounting for parameters such as bioaccumulation). Additionally, environmental quality standards might be set for annual averages (AA-EQS) or short-term exposure (MAC-EQS) (Warne et al., 2022, Norman Network, 2022).

Due to the large number of chemicals and their global distribution, not every chemical that is present in local water bodies will have a defined water quality standard. Therefore, it can occur that even though a pesticide is used, there is no local threshold set for it.

However, even when all chemicals are below their respective PNECs or other defined water quality standards, ecosystems might be affected by mixtures of chemicals due to potential additive or synergistic effects (Heys et al., 2016). To assess whether local ecosystems are sufficiently protected (i.e., represent the "desired state of nature"), single pesticides should not only be considered in isolation but also as local chemical mixtures.

To assess the impact or risk of chemical mixtures in local water bodies, several approaches can be followed, with the aggregation of PAF into multi-substance potentially affected fraction of species (msPAF) across chemicals contributing to a mixture as the main recommended approach. In an exploratory assessment, one can start with quantifying a hazard index, based on risk quotient approaches, with a regulatory-adopted protective concentration standard as the denominator:

- *Hazard index*: A Risk Ratio or Risk Quotient for a single compound is defined as the measured or predicted concentration divided by the regulatory-adopted protective standard, such as a PNEC. This metric can be extended for mixtures by summing the ratio values over substances of interest to derive a hazard index. A summed risk ratio below 1 implies sufficient protection against adverse effects for the (potentially) three protection goals, namely, (1) human health impacts, (2) ecological (biodiversity) impacts via direct effects of chemicals on species, or (3) ecological impacts via indirect (food-chain) exposure (Bodar et al., 2024). If the resulting value exceeds 1, this value marks insufficient protection in the regulatory sense. However, the interpretation is less clear, as the PNEC might be linked to various protection targets and safety factors (see assessment factor above). Since the value beyond 1 indicates insufficient protection, a mixture toxicity approach can help characterize the expected biodiversity impacts, i.e., msPAF.

- *msPAF:* The multi-substance potentially affected fractions (msPAF) metric allows calculation of a total mixture toxicity by combining effect data for multiple species, substances, and measured or predicted concentrations. It directly relates to the effects on aquatic ecosystems and indicates the percentage of species that a specific mixture of substances likely affects. msPAF can be used to assess pesticide mixtures,

e.g., the Pesticide Risk Metric, used in the pesticide target for the Great Barrier Reef (99% of species protected at the end of catchments) (Neelamraju et al., 2025; Warne et al., 2020), or for assessing mixtures of various chemicals (e.g., Key Factor Toxicity).

- *Effect-based methods:* Effect-based monitoring, based on *in vivo* (i.e., tests with living organisms), *in vitro* (e.g., bioassays), or *in situ* methods (e.g., bioassessment in the field), can indicate whether an aquatic ecosystem is affected by a chemical mixture, independent of knowledge of chemical composition, based on predefined water quality effect-based trigger values (Brack et al., 2018; Neale et al., 2022). While this method is not yet broadly applied, the European Union (EU), for example, aims to use effect-based monitoring to complement its water quality monitoring (Council of the EU, 2025). This method is useful for contributing chemicals to a basin-level mixture when the pressures are unknown, but the basin still needs to be categorized by its overall potential risk.

Appendix B: Criteria for approach selection

How to use this appendix

This appendix provides the criteria companies use to assess whether the resources supporting target setting are appropriate, as defined in Section 3.1.1.

Appropriateness has two dimensions:

- *Technical credibility*: whether a resource is scientifically robust, transparent, and fit for purpose;
- *Contextual appropriateness:* whether a resource is suitable for the specific basin context and ecological conditions.

Companies should first identify the target setting approach they intend to apply (Section 3.1.1). They should then use the relevant criteria in this appendix to assess the technical credibility of the models, thresholds, assessments, tools or other resources supporting that approach.

Contextual appropriateness is assessed through stakeholder consultation, as described in Section 3.1.2. Stakeholder consultation complements, but does not replace, the technical assessment.

Stakeholders are expected to provide input on:

- Whether the selected technically credible resources are suitable for the basin context;
- Any known limitations or important basin-specific considerations they identify; and
- Whether alternative or more appropriate local resources are available.

Stakeholders are not expected to independently validate models, calculations, or methodologies. Their role is to provide relevant basin-specific evidence that supports or challenges the use of the selected resources.

Companies must conduct and document stakeholder consultation in accordance with Section 3.1.2. Stakeholder responses must be recorded using the standardized response categories:

- Supports
- Supports with conditions
- Does not object
- Does not support.

Definition of technical credibility

A resource (model, threshold, assessment, or tool) is considered technically credible when it:

- Is based on scientifically established or widely accepted methodologies;
- Clearly documents assumptions, inputs, and limitations;
- Demonstrates internal consistency between pressure, state, and threshold relationships;
- Is appropriate for the spatial and temporal scale at which it will be applied.

All resources used in target setting must meet these conditions, regardless of the approach

selected. Companies must provide sufficient methodological documentation and references to demonstrate that these criteria are met.

Stakeholder categories

Drawing on guidance from the Organisation for Economic Co-operation and Development (OECD) and the Alliance for Water Stewardship (OECD, 2015; AWS, 2026), SBTN derived a list of acceptable stakeholder groups that are likely to have relevant information to inform the approach selection. Companies are ***required*** to consult appropriate stakeholders with specialized knowledge and insights relevant to the basin or ecohydrological science. Stakeholders are expected to fall into one or more of the following categories:

1. Authoritative stakeholders with formal responsibility for freshwater management.
    - National water authorities or ministries involved in water resource allocation.
    - Water management agencies/basin authorities. Authorized basin agencies are governmental agencies that have the authority to make decisions on the allocation of water resources. Examples include basin management authorities, water resource management agencies, and catchment councils;
    - Governmental regulators (water quantity/ quality).
    - Relevant local departments involved in water supply to the facility.

2. Technical stakeholders with demonstrated basin-specific technical expertise.
    - Country offices of SBTN Freshwater Hub partner organizations (the World Wide Fund for Nature [WWF], The Nature Conservancy [TNC], The Pacific Institute, and the World Resources Institute [WRI]). Consultation may also involve other environmental nonprofits or research organizations with freshwater expertise.
    - Scientists and academics at universities involved in the basin and government research institutions; and
    - Local water-related NGOs or local chapters of international NGOs (WWF, TNC, etc.).

3. Contextual or rights-holder stakeholders who can provide insight into governance, feasibility, or rights-related considerations.
    - Local communities, rights holders, and/or Indigenous groups or their representatives.

Threshold selection criteria

The criteria below are used to assess the technical credibility of resources. Contextual appropriateness should be assessed separately through stakeholder consultation (Section 3.1.2).

These criteria help companies and consulted stakeholders determine whether a freshwater-related threshold, goal, or standard reflects safe operating boundaries designed to protect freshwater ecosystems and the services they support. Models and tools may also have multiple thresholds integrated. The criteria below apply to thresholds for surface water quantity and nutrients (nitrogen and phosphorus). Pesticide thresholds are assessed using the pesticide-specific criteria in Section B.

A. UNIVERSAL CRITERIA OF NATURE-PROTECTIVE FRESHWATER THRESHOLDS *(APPLY ACROSS SURFACE WATER AND NUTRIENTS)*

Primary (should meet ≥ 3 of 5):

1. Ecological purpose is explicit—The boundary clearly identifies which ecosystem or ecological function it protects. Ecological protection is an intended objective, not incidental.
2. Thresholds are based on ecological science (required)—Limits reflect ecological knowledge, such as:
    - Environmental flows
    - Biological sensitivity thresholds
    - Aquatic life water quality standards.
3. Seasonal and timing needs are reflected. Protective boundaries represent:
    - Dry-season low flows
    - Migration or spawning periods
    - Algal bloom/hypoxia season.
4. Prevents irreversible harm—Boundaries avoid known thresholds that cause long-term or permanent degradation:
    - Aquifer compaction
    - Loss of baseflows
    - Persistent eutrophication
    - Species extirpation
    - Salinity intrusion.
5. Cumulative impacts are considered—Freshwater systems experience multiple stressors simultaneously. Protective boundaries account for:
    - Combined abstractions
    - Combined N & P loads
    - Legacy nutrient stores
    - Groundwater travel-time lags.

Secondary:

6. Precaution and safety margins are included—Boundaries incorporate buffers or conservative assumptions, especially where data gaps or uncertainty exist;
7. Validated with observations—Predictions or thresholds are compared with local measurements such as stream flow, groundwater levels, water quality data, or biological indicators;
8. Reflects local governance and knowledge—Local and Indigenous Peoples' water rights, existing regulatory standards, and hydrological alterations (e.g., dams, diversions) are acknowledged.

B. PRESSURE-SPECIFIC CRITERIA

The following criteria apply in addition to the universal criteria above. For each pressure addressed, the threshold should meet at least primary pressure-specific criteria.

Surface Water Quantity

Primary criteria:

- Includes environmental flows and natural flow regime components (required);
- Represents major hydrologic alterations (e.g., dams, transfers);

- Protects both low-flow conditions and essential high-flow pulses; and
- Considers river and floodplain connectivity.

Secondary criteria:

- Includes water quality considerations where ecologically material (e.g., saltwater intrusion);
- Accounts for extreme hydrological events.

Nutrients (N & P)

Primary criteria:

- Based on ecological endpoints (e.g., algal blooms, chlorophyll-a, hypoxia, dissolved oxygen [DO]);
- Accounts for major nutrient sources (e.g., point, non-point, legacy);
- Reflects seasonal nutrient dynamics.

Secondary criteria:

- Includes nutrient retention/attenuation processes;
- Represents hydrological controls (e.g., runoff events, residence times).

Pesticides

Primary criteria:

- Ecological endpoints for thresholds: Thresholds should be derived from aquatic ecotoxicity data;
- Mixture consideration (required): When combined with local measured or predicted concentrations, impacts must be aggregated across substances to account for mixture effects (see mixture toxicity in the glossary and Appendix A for further information on chemical thresholds).

Secondary criteria:

- Aquatic ecotoxicity data specifications: Aquatic ecotoxicity data for threshold derivation should ideally include chronic endpoints and data for locally relevant species

C. SUMMARY TABLES OF PRIMARY AND SECONDARY CRITERIA

These tables provide a concise reference for companies and validators.

Table B1: Universal criteria.

Category	Criterion	Type
Ecological intent	Ecological purpose is explicit	Primary
Scientific basis	Thresholds based on ecological science (required)	Primary
Temporal dynamics	Seasonal and timing dynamics represented	Primary
Environmental integrity	Prevents irreversible harm	Primary
Systemic perspective	Cumulative impacts considered	Primary

Safety	Precautionary margins included	Secondary
Evidence	Validated with observations	Secondary
Transparency	Methods and assumptions documented	Secondary
Local relevance	Reflects local governance/knowledge	Secondary

Table B2: Pressure-specific criteria.

Surface Water Quantity

Criterion	Type
Environmental flows and natural flow regime represented (required)	Primary
Human flow alterations (e.g., dams, transfers) represented	Primary
Low-flow and high-flow ecological needs protected	Primary
Connectivity considered	Primary
Water quality where material	Secondary
Extreme hydrological events represented	Secondary

Nutrients (N & P)

Criterion	Type
Ecological endpoints for thresholds	Primary
Major nutrient sources represented	Primary
Seasonal nutrient dynamics	Primary
Nutrient retention/attenuation	Secondary
Hydrological controls (e.g., runoff, residence time)	Secondary

Pesticides

Criterion	Type
Ecological endpoints for thresholds	Primary
Mixture consideration (required)	Primary
Aquatic ecotoxicity data specifications	Secondary

Transparent and Reproducible	Secondary

Model and tool selection criteria

These criteria help companies and consulted stakeholders determine whether a model or tool is appropriate for setting science-based targets.

Models are decision-support tools that simplify complex systems to enable consistent and transparent analysis. They may be hydrological, contaminant fate, ecological, or chemical impact models. However, they remain approximations. Their inputs, assumptions, and structures cannot fully capture basin-specific ecohydrology, water management practices, or pollutant pathways. As a result, model outputs may overestimate or underestimate local conditions and should therefore be treated as directionally correct indicators rather than exact representations of local conditions. There is an inherent trade-off between local accuracy and broad applicability. For this reason, model results must always be interpreted alongside the best available ecological and hydrological science, as well as stakeholder and rights-holder knowledge, monitoring data, and thresholds, where available, to ensure robust and credible targets. Where local models, thresholds, or empirical evidence exists, these should be prioritized.

LOCAL MODEL SELECTION AND EVIDENCE BASE FOR SURFACE WATER, NUTRIENTS, AND PESTICIDES

The criteria below apply to local models used for Freshwater Quantity, Nutrient Freshwater Quality, and, where relevant, Pesticide Freshwater Quality targets. Local model selection is relevant for pesticides if local concentrations are predicted using hydrological and contaminant fate models. A contaminant fate model can assess how pollutants are released, transported, degraded, or accumulated in the environment and, therefore, estimate pollutant concentrations (e.g., nutrients or pesticides).

Companies may include additional criteria for stakeholders to use when assessing the appropriateness of a local model. Stakeholder input must be documented in accordance with Section 3.1.2. Stakeholder consensus on every criterion is not required for validation. Stakeholders must consent to be quoted; otherwise, companies must anonymize their comments and report them by stakeholder type.

Primary—local models should meet at least three of the following conditions:

- Accounts for legal water allocations, Indigenous and customary rights, and basic human needs (e.g., drinking water, sanitation), without compromising minimum ecological protections.
- Has been ground-tested in the basin or had its predictions corroborated by observed data.
- Accounts for cumulative impacts arising from multiple sources of pressures acting simultaneously on the freshwater system.
- Accounts for major anthropogenic disturbances to surface flows (e.g., dams, canals/cross-basin transfers, fragmentation/connectivity).
- Accounts for major anthropogenic sources of nutrient or pesticide pollution in the basin (only water quality).

- Accounts for fate processes (and pollutant-specific related properties), such as degradation, transformation, partitioning, dilution, and accumulation (only water quality).
- Accounts for most pesticides used locally (only pesticides).

Secondary—local models should meet at least two of the following conditions:

- The model includes an ecologically based threshold component relevant to the pressure.
- The model is transparent and includes sufficient documentation for companies and validators to understand how inputs were selected and how outputs were generated. Key assumptions and data gaps are clearly documented.
- The model is informed by local stakeholder input, including Indigenous Peoples and local communities, particularly where local knowledge provides relevant insights on freshwater dynamics.
- Accounts for local, national, or international water quality standards for relevant pollutants (only water quality).

Regionalized global models. Where the model applied under approach 1a is a regionalized version of a global model, the criteria above apply in full. In addition, companies must provide:

- Documentation of the regionalization: spatial resolution, input datasets, parameterization, and any recalibration relative to the original global model;
- Evidence of basin-level performance for each basin of application (e.g., simulated versus observed flows, groundwater levels, or concentrations);
- Peer-reviewed publication of the model, or documentation by a designated water management agency or equivalent authoritative body; and
- The required basin-wide reduction obtained from the SBTN-approved global model for the same basin(s), reported alongside the result derived from the regionalized model. Where the regionalized model yields a materially less stringent reduction, the company must explain the basis for the difference.

Reporting the SBTN-approved model result is a transparency requirement and does not by itself determine which value is used.

If using a combined surface water and groundwater model (or "integrated" model) or a groundwater model only, a designated water management agency must apply the model to define water use. Company-specific allowable pumping, as specified in the plan, should be used as the basis for setting targets.

CHEMICAL FOOTPRINT TOOLS CRITERIA

A chemical footprint tool used for Pesticide Impact Reduction target setting *must* meet the following criteria:

- Reports results per chemical (allows contribution of chemicals to impact and aggregation to be traced back across chemicals).
- Considers ecotoxicological effects on freshwater ecosystems (e.g., through species sensitivity distributions or integrated into regulatory threshold values).
- Considers emissions, fate, persistence, and mobility (e.g., through emission fractions, half-lives, and sorption coefficients).
- Expresses results in terms of potential ecotoxicity impact (e.g., building on metrics such as the potentially affected fraction of species [PAF]).

- Key assumptions and data gaps should be clearly documented for transparency. Sufficient documentation is provided to understand how inputs were selected and how outputs were generated.

In addition, SBTN recommends that the chemical footprint tools meet the following criteria:

- Considers emissions, persistence, mobility, bioaccumulation, and exposure (e.g., through mission, fate and bioavailability modeling, or using emission fractions, half-lives, sorption coefficients, and bioaccumulation factors as proxies).
- Covers all or most pesticides used by the company.
- Is used by an authoritative body, and/or is supported or endorsed by farmer associations to estimate source-to-impact for pesticide usage, or is used by accredited companies for formal risk or impact assessments by local authorities or other formal bodies.

GLOBAL APPROACH APPROVAL

SBTN-approved global models have already been assessed for technical credibility. Companies and stakeholders therefore do not need to reassess their model structure or internal assumptions.

Instead, stakeholder consultation should focus on whether the global approach provides a reasonable and sufficiently conservative representation of the specific basin.

Companies may include additional criteria for stakeholders to assess the appropriateness of global approaches to local basin conditions. Stakeholder input must be documented in accordance with Section 3.1.2. Stakeholder consensus on every criterion is not required for validation Stakeholders must give their consent to be quoted; otherwise, companies must anonymize their comments and report the comments according to stakeholder type.

Global approaches are considered appropriate to be used in a given basin if, in the opinion of local stakeholders, the following criteria are fulfilled (opinions indicated via the responses "Supports / Supports with conditions / Does not object / Does not support"):

- The basin does not have major inter-basin water transfers, dams, or diversions apart from those accounted for by the model.
- The basin is not subject to major disputes over water rights or access, except those accounted for by the model.
- The basin does not have major anthropogenic disturbances to nutrient flows apart from those accounted for by the model.
- The basin does not contain threatened (terrestrial or freshwater) species or ecosystems that are highly dependent on water flows beyond the global model's considerations for e-flows.
- The basin does not contain (terrestrial or freshwater) species or ecosystems that are highly sensitive to freshwater nutrient concentrations or dissolved oxygen (DO) concentrations.
- The model adequately reflects key pressures (e.g., water abstraction, pollution sources).
- The model results appear broadly consistent with observed basin conditions
- Stakeholders have not challenged the model in the past for inaccuracy regarding the water regime in the basin.

Specifically for groundwater, global approaches are considered appropriate for use in a given basin if, in the opinion of local stakeholders, the following criteria are fulfilled:

- The aquifer is not a perched aquifer.

- The aquifer does not sit beneath steep terrain (≥ approximate 15% slope)[14].
- The aquifer is not vulnerable to saltwater intrusion.

If any of these conditions materially affect freshwater behavior and are not represented in the global groundwater model for the basin, companies *must* adopt an acceptable local groundwater model to set a science-based target.

Stakeholders are not required to confirm global model correctness or reproduce its outputs. Stakeholders may indicate limited familiarity with the global model, or be unable to assess its applicability. Companies may still proceed, provided they document their outreach efforts and demonstrate that the selected model meets SBTN technical criteria.

Global model technical documentation:

- Surface water quantity (Hogeboom et al., 2020)
  - https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019EF001363
  - V1: https://data.4tu.nl/file/089afa18-bbd5-493e-8a6c-39e1ca7b2a59/de7838eb-5112-4661-acb4-c9a46edc80b4
  - V2 change log: https://data.4tu.nl/file/089afa18-bbd5-493e-8a6c-39e1ca7b2a59/02fb0999-d104-4c5a-9923-c0dc896598c1

Hogeboom et al. (2020) estimated natural stream flow as the ensemble mean of monthly flows from three global hydrological models under no-withdrawal conditions[15]. They derived monthly e-flow requirements using established methods and calculated the water available for human use for each basin and month over 1970–2005. The updated model applies Equation 1 at basin level for each month of 1990–2019 and gives, for each Pfafstetter Level 5 basin, the reduction needed for e-flow requirements to be met about 75% of the time.

- Nutrients (McDowell et al., 2025)
  - https://www.nature.com/articles/s41467-025-57054-8
- Groundwater (GSGM-2; Liu et al., 2026)
  - Model: https://egusphere.copernicus.org/preprints/2026/egusphere-2026-3448/
  - Post-processing documentation: https://cgs-earth.github.io/wwf-btt-user-guide/groundwater_pumping.html

GSGM-2 couples the global hydrology and water-resources model VIC-WUR with the groundwater flow model MODFLOW 6 (Liu et al., 2026) to simulate groundwater-level responses to alternative pumping scenarios under future climate conditions (de Graaf, in prep.). It runs at approximately 5 arc-minute resolution, with daily time steps for surface water and monthly time steps for groundwater. Results cover pumping scenarios for 2015–2100 (GFDL-ESM4 climate forcing), aggregated to Pfafstetter Level 5 basins. The threshold is a statistically stable or rising groundwater-level trend. The model reports the minimum basin-wide pumping reduction that achieves this (stability-achievable basins), or classifies the basin as non-reversing where no tested reduction, including full cessation of pumping, does so. Results may over- or underestimate local aquifer conditions and should be applied with awareness of this limitation.

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[14] A limitation of the de Graaf global groundwater model is that the grid-resolution (5 arc-minutes, approx. 10 km at the equator) is still too coarse to capture local aquifers in higher and steeper terrain.

[15] The global hydrologic models currently being used are H08 (Hanasaki et al., 2008); PCR-GLOBWB 2 (Sutanudjaja et al., 2018); and WaterGAP-2C (Müller Schmied et al., 2016).

Monitoring data and assessments criteria

Where monitoring data or derived assessments are used, they should meet the following criteria:

- Monitoring data must be representative of basin conditions and reflect spatial variability in the defined basin.
- Companies should demonstrate that monitoring data capture periods during which peak pressures are expected (e.g., fertilizer and pesticide application periods, storm runoff events, seasonal high-flow conditions, or other pressure-specific peak periods) or provide evidence that the monitoring design is sufficient to represent those conditions. A minimum number of thirty samples is required, unless companies can demonstrate that a smaller number of samples adequately characterizes the average condition.
- Water quality monitoring laboratories must be certified via a regional, national, or global (e.g., ISO/IEC 17025) accreditation program.
- Monitoring data may not be available for all relevant locations within the basin. Companies may then use interpolation, extrapolation, or weighted aggregation, provided they demonstrate that:
    - The method is scientifically justified;
    - The weighting or interpolation variable is relevant to the pressure being assessed;
    - Spatial variability is adequately represented;
    - The approach is unlikely to introduce material bias; and
    - Assumptions, limitations, and sources of uncertainty are documented.

Assessments (e.g., reports, studies, dashboards) must:

- Clearly document data sources and analytical methods; and
- Explicitly link state indicators to thresholds or, for pesticides, “safe” benchmarks (refer to threshold criteria)

Where assessments are used without an explicit model or monitoring data:

- The relationship between pressure and state must be clearly defined or reasonably inferred.

Combining resources criteria

In cases where complete resource sets are not available, resources may be combined. Acceptable combinations must:

- Include both:
    - A threshold defining the desired state of nature; and
    - A method linking pressure to state (e.g., model, monitoring data, or assessment).
- Ensure consistency across:
    - Spatial scale
    - Temporal scale
    - Underlying assumptions
- Avoid combining methodologically incompatible resources without justification

Where hybrid approaches are used:

- Companies must document how resources are combined; and

- Stakeholder input must confirm that the resulting approach is reasonable for the basin context.

Government-established environmental objectives requirements

Government-established objectives may be used as technically credible inputs where their ecological basis is clear. These objectives may include:

- Objectives on thresholds or the desired state of nature (e.g., e-flows, water quality standards)
    - Can be used directly as thresholds where they meet threshold criteria;
- Pressure-reduction goals (e.g., basin-wide caps or reduction targets)
    - Can be used if linked to ecological outcomes and the desired state of nature; and
- Broader freshwater restoration and protection commitments or pressure-reduction goals which are directionally correct (e.g., national commitments)
    - Not sufficient on their own unless clearly linked to an ecologically protective threshold.

Government-established environmental objectives may define basin- or system-level ecological limits. Where these objectives do not specify allocations specific to the company, a company should use them in conjunction with an appropriate back-calculation or direct application method to determine its individual target.

Appendix C: Stakeholder consultation recommendations for approach selection

These recommendations support companies in conducting the stakeholder consultation required under Step 3a. Section 3.1.2 defines the decision points that consultation must address and the minimum consultation requirements. Appendix C provides practical recommendations for identifying stakeholders and structuring outreach. Recommendations for efficient consultation are set out in Rec. 2 (Section 3.1.2).

Background

Since the initial release of the Freshwater methods in 2023, companies and SBTN have gained practical experience applying stakeholder consultation to support approach selection.

This experience shows that stakeholder consultation can significantly strengthen basin understanding, improve confidence in selected approaches, and support alignment with other actors. At the same time, companies often face common challenges, including limited availability of suitable local data or models, difficulty identifying relevant stakeholders, and variable response rates.

These insights inform the recommendations below and highlight that global approaches can be appropriate where local resources are unavailable or do not meet SBTN criteria.

Framing the consultation request

A clear opening helps stakeholders understand what is being asked and why. Companies are encouraged to cover:

- who the company is and its connection to the basin (e.g., sites or sourcing);
- that it is setting science-based targets for freshwater under SBTN;
- what input is requested: views on whether an approach suits the basin, not validation of calculations or endorsement of targets;
- the expected time commitment, and how the input will be used and acknowledged.

Example: "We source [commodity] from [basin] and are setting a target to reduce our water use there in line with what the basin can sustain. We would value your view on whether [model/threshold] is a sound basis for that target. This should take about [30 minutes]. We are not asking you to check our calculations or endorse our target."

Plain-language versions of the questions in Section 3.1.2 may help, provided each decision point is still addressed:

- Is there an accepted limit on how much water can be taken from [basin], or on nutrient levels in its rivers?
- Does [model/threshold] reflect conditions in [basin], such as seasonal low flows or falling groundwater?
- Is there a better local source we should use, such as a basin plan or a water authority

model?

- What should we be cautious about if we use it?
- (Pesticides) Are pesticides used in [basin] monitored in rivers or lakes, and are there limits for them?

Recommendations for identifying relevant local stakeholders

As an early part of the stakeholder consultation process, SBTN recommends that companies contact site staff to learn about the local, regional, or national water authorities. Questions to ask site staff include:

- Does the site require a permit or comply with any regulations or agreements regarding its pressures?
- Which agencies or basin authorities issue the site's permits?
- Which agency or utility bills the site for its water use?
- Have they spoken with anyone else in the area about water? E.g., academia, NGOs, community groups, etc.

After identifying the relevant authorities, companies should follow the approach selection process outlined in Section 3.1.2 of this guidance.

SBTN also suggests that companies perform desktop research to learn about 1) other relevant stakeholders in the region; 2) local models and thresholds; 3) other target setting and implementation actions occurring in the basin; and 4) prospective partners for collective action. The following list of questions may support the consultation process:

1. Who manages water in the basin?
2. Do national or regional water targets (or goals) exist?

Existing local resources:

3. Are there documented local resources (e.g., models, thresholds, environmental objectives, assessments, or chemical footprint tools) that local water authorities or other relevant institutions use to manage water quantity or water quality in the basin?
4. Are there other documented basin-level resources—whether or not currently used by local authorities—that could inform target setting?
5. If suitable local resources do not exist, are the SBTN global approaches for water quantity and nutrient water quality appropriate for application in this basin?
6. Are pesticide concentrations in the basin adequately monitored, and are environmental quality standards or thresholds in place for pesticides used locally?

Existing water stewardship efforts:

7. Which crops are grown in the basin?
8. What industries/companies operate in or source from the basin?
9. Are there active corporate water stewardship programs in the basin?
    - Are there any Alliance for Water Stewardship (AWS) certified sites or Collective Action Accelerator programs?
    - Are there activities in the Water Action Hub and 100 Priority Basins?
    - Could resources through other global approaches be leveraged?

Finally, in order to fulfill SBTN's stakeholder consultation requirements and achieve higher impact, companies should be prepared to invest in stakeholder relationship building and consultation (See SBTN's stakeholder engagement guidance).

Relationship with target 3: Landscape Engagement target (from SBTN Land

guidance)

Stakeholder consultation for Freshwater target setting provides important input for selecting an approach under Step 3a and supports alignment with Appendix B criteria. It may also identify gaps in data, monitoring, or local capacity within a basin.

In some cases—particularly for pesticides—these findings require a Pesticide Landscape Engagement target to be set (see Section 3.1.2), which focuses on addressing basin- or landscape-level challenges through collective action with other actors and builds on the Landscape Engagement targets detailed in the Land guidance.

Landscape Engagement should be considered across both Freshwater and Land targets. Companies may already have established Land Landscape Engagement targets or partnerships in a given geography, which can be leveraged to support Freshwater targets. Conversely, stakeholder consultation for Freshwater targets may identify system-level challenges (e.g., agricultural practices or input use) that require alignment with or expansion of Land Landscape Engagement efforts.

While the primary purpose of consultation is to inform decisions about approach selection, it can also help companies build the relationships and contextual understanding needed to support effective, coordinated landscape-level action over time.

A company may be setting a Land Landscape Engagement target and a Freshwater target in the same basin at the same time. The Freshwater documentation should then be included in the validation submission first, so that the selected approach and its stakeholder consultation are on record before landscape commitments are validated.

Consultation resources

Appendices C.1–C.3 provide optional resources to support stakeholder consultation in Step 3a:

- an information sheet companies may attach to consultation requests (C.1);
- a response form that follows the decision points in Req. 15 and records responses in the standardized categories (C.2); and
- a checklist summarizing the consultation requirements and recommendations for each basin (C.3).

Companies may adapt them to the local context and language. Using these resources does not by itself demonstrate that consultation requirements are met. The requirements in Section 3.1.2 apply.

Stakeholder information sheet

Companies may attach this sheet to consultation requests made under Step 3a (*Section 3.1.2*). Text in [brackets] is completed by the company. Companies send the sheet themselves. It does not indicate that SBTN has reviewed, validated, or endorsed the company or its targets.

Request for input on freshwater target setting in [basin name]

About this request

[Company name] is setting science-based targets for freshwater using the methods of the Science Based Targets Network (SBTN), a network of non-profit organizations that develops methods for companies to set measurable, science-based targets for nature. [Company name] [operates sites in / sources from] [basin name], and its activities there contribute to [water use / nutrient pollution / pesticide pollution].

Before setting a target, SBTN requires companies to consult people with knowledge of the basin on the approach they plan to use to determine how much pressure (i.e., withdrawals, pollution) on freshwater needs to be reduced. Basin knowledge of this kind cannot be replaced by desktop research.

What we are asking

Your view on whether [model / threshold / approach] is a suitable basis for a target in [basin name], and whether better local information exists. A short response form is attached, but you are welcome to reply by email or in a call. We expect this to take about [30] minutes.

What we are not asking

- To check calculations or validate models;
- To approve or endorse the company's target; or
- To commit to any further involvement.

How your input will be used

Your response will inform the company's choice of approach. It will be shared, with your name, organization, and role, with Accountability Accelerator who validate the company's targets. [Company name] will not publish your name without your permission. Responding, whether or not you support the proposed approach, does not mean you endorse the company or its targets.

Practical details

Response requested by	[Date: at least eight weeks after this request]
Questions about this request	[Company contact name, email]
About SBTN and its methods	[SBTN contact or webpage]

Stakeholder consultation response form

This form is optional. Stakeholders may respond in any format. Where a stakeholder responds by email or in a call, the company may use this form to record the response. The questions follow the decision points in Req. 15—Stakeholder consultation scope, and the overall view in Part D uses the standardized response categories in *Section 3.1.2*. Using the form does not by itself demonstrate that consultation requirements are met.

Part A. Completed by the company before sending

Company	[Name]
Basin	[Name and identifier]
Pressure(s)	☐ Freshwater Quantity ☐ Nutrients ☐ Pesticides
Proposed approach	☐ Local ☐ Global ☐ Pesticide fallback
Proposed resources	[Model, threshold, assessment, or tool; source; link]
Result shared (if any)	[e.g., required basin-wide reduction from the global model]
Date sent / response requested by	[Date] / [Date]

Part B. About you

Name	
Organization	
Role or area of expertise	
Category (company confirms)	☐ Authoritative ☐ Technical ☐ Contextual/rights holder e.g., basin authority or regulator; university or NGO scientist; Indigenous Peoples' organization or community water committee

Part C. Questions

1	**Local resources.** Are you aware of any models, thresholds, monitoring assessments, basin plans, or government objectives for [water use / nutrients / pesticides] in [basin name]? ☐ Yes (please name or link) ☐ No ☐ Don't know Comments:
2	**Suitability.** Does [proposed resource] reflect conditions in the basin? For example, is it relevant to the basin's ecology and hydrology, based on credible data for this basin, and suited to its area and time period? ☐ Yes ☐ Partly ☐ No ☐ Don't know Comments:
3	**Alternatives.** Is there a better local source we should use instead? ☐ Yes (please name or link) ☐ No ☐ Don't know Comments:
4	*Global approach only.* **Global model.** Does the global model's result seem reasonable for this basin, and at least as protective as local knowledge would suggest? ☐ Yes ☐ No ☐ Don't know Comments: Hint for companies: Stakeholders can judge a result more easily when they see what it implies for the basin, not just a percentage. Include: the basin boundary (a simple map); the model's current-state value and the threshold it compares against, in units stakeholders use (e.g., mg/L, monthly flow); the required basin-wide reduction; the data period and resolution; and one or two known limitations. Then ask about something specific they can check against local experience, such as months of stress or problem areas. **Example (Nutrients):** "The global model estimates a current median phosphorus concentration of 0.10 mg/L in [basin], against a threshold of 0.046 mg/L, and identifies phosphorus as the limiting nutrient. This implies a 67.5% reduction in human-caused phosphorus load across the basin. The model uses data from [years] at [resolution] and may not capture [e.g., point sources or reservoir effects]. Does this match what you see in local monitoring? Are there areas or seasons where conditions are worse than this suggests?"
5	*Pesticides only.* **Monitoring and limits.** Are pesticides used in the basin monitored in rivers or lakes, and are limits (environmental quality standards or thresholds) defined for them? ☐ Monitored, and limits defined ☐ Not sufficiently monitored ☐ Limits not defined ☐ Don't know Comments:

6	**Limitations and risks.** What should we be cautious about if we use this approach? Comments:

Part D. Overall view (select one)

☐ Supports	The proposed approach is suitable for the basin.
☐ Supports with conditions	Conditions:
☐ Does not object	No concerns raised, without a positive view either way.
☐ Does not support	Reason:

Part E. Use of your response

Your response will be shared, with your name, organization, and role, with the Accountability Accelerator who validate the company's targets. For any public reference to this consultation:

☐ Name and organization may be cited ☐ Organization only ☐ Do not cite publicly

Name: _____ Date: _____

Part F. Completed by the company after the response

Response format	☐ This form ☐ Email ☐ Call or meeting (notes attached)
Date received	
Follow-ups sent (dates)	
Criteria informed	☐ Ecological and hydrological relevance ☐ Scientific robustness in context ☐ Scale alignment ☐ Existence of superior local approach ☐ Global model as a proxy (if applicable) ☐ Pesticide monitoring and limits (if applicable)
How the input was used	[Effect on approach selection; for a "does not support" response or conflicting views, the rationale for the final selection]

Pesticide Landscape Engagement trigger	☐ Not triggered ☐ Triggered (Req. 5, Case 1) Triggered where the stakeholder reports that local pesticides are not sufficiently monitored or that limits are not defined.

Stakeholder consultation checklist

This checklist summarizes the stakeholder consultation requirements and recommendations in *Section 3.1.2* for each basin. It does not add requirements; where it differs from the main text, the main text applies.

Item	Reference	Status	✓
Before outreach			
Checked the Basin Threshold Tool and Target Tracker for local resources	Req. 13	Required	☐
Confirmed whether consultation is required (all top-priority basins; other basins where local resources, pesticide resource gaps, or groundwater concerns apply)	Section 3.1.2, Task 1	Required	☐
Completed desktop research on local resources and stakeholders	Rec. 2	Recommended	☐
Identified stakeholders by category (authoritative, technical, contextual/rights holder)	Table 7; Appendix B	Required	☐
Prepared a request that covers every decision point	Req. 15	Required	☐
Stated that stakeholders are asked about suitability, not to validate calculations or endorse targets	Section 3.1.2	Required	☐
Shared global model results where the global approach is under consideration	Section 3.1.2	Recommended	☐
Excluded SMEs from the stakeholder count	Req. 16	Required	☐
Outreach			
Sought input from at least one authoritative or technical stakeholder and, where feasible, from one additional stakeholder in a category other than the first	Req. 14	Required	☐

Item	Reference	Status	✓
For the global approach in a top-priority basin: consulted at least three stakeholders across at least two categories	Section 3.1.2	Required	☐
Included rights holders, including Indigenous Peoples and local communities, where relevant	Section 3.1.2	Recommended	☐
Allowed at least eight weeks from first contact and sent at least two follow-ups, with dates recorded	Section 3.1.2	Required for failed outreach	☐
Recording responses			
Recorded each response in one of the four standardized categories	Section 3.1.2	Required	☐
Retained evidence identifying the organization, person, role, basin, and dates of contact	Req. 14	Required	☐
Mapped responses to the Appendix B criteria	Section 3.1.2	Required	☐
Pesticides: set a Pesticide Landscape Engagement target where any stakeholder reports insufficient monitoring or undefined limits	Section 3.1.2; Req. 5	Required	☐
Completing consultation			
Top-priority basins: received at least one substantive response from an authoritative or technical stakeholder, or applied the global approach	Section 3.1.2	Required	☐
Failed outreach: independently assessed the selected resources against Appendix B and selected under options (a) to (e)	Section 3.1.2; Req. 14	Required	☐
Documented any disagreement and the rationale for the final selection	Section 3.1.2	Required	☐

Item	Reference	Status	✓
Submitted consultation evidence with the approach-selection documentation	Task 3; Section 3.1.3	Required	☐
After validation: checking the Basin Threshold Tool annually for new local resources	Section 3.1.2	Required	☐

Appendix D: Future directions for setting Pesticide Impact Reduction targets

Pathways for determining and measuring reduction progress against local reduction targets are under development (e.g., pathways based on absolute environmental sustainability assessments—see Kosnik et al., 2022 and Bjørn et al., 2026). However, current approaches are not mature enough, and data to set local targets that precisely quantify the "maximum allowable pressure" are currently largely missing. The ideal steps for defining company-specific allowable pressures and impact reduction targets would cover:

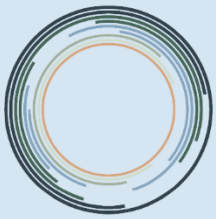
1) The impact capacity (i.e., the capacity within which no adverse or irreversible damage to an ecosystem would occur), with respect to all chemical inputs in the given local area (e.g., a water catchment), needs to be quantified. It should include both direct emissions into the considered area, and down-the-drain contributions in the given area resulting from upstream emissions into other areas, including both pesticide and industrial chemical inputs from various human activities.
2) The share of the impact capacity that can be allocated to a given set of pesticides (e.g., associated with pesticide use on a given farm) in the given local area needs to be determined. This requires applying sharing principles to fairly distribute the impact capacity among all contributing actors.
3) The impact of the contributing set of pesticides (e.g., from their use on a given farm) needs to be quantified and compared to the respective impact capacity for the affected local area. Where the impact exceeds the local impact capacity, a percentage reduction is needed until the carrying capacity level is reached.

The local approaches outlined in Sections 3.5.1.1 and 3.5.1.2 attempt to approximate this pathway. We aim to refine this approach further if methods for better allocation of pressure reduction in the context of chemical pollution become available. In the meantime, to guide companies and farmers toward meaningful impact, the relative Pesticide Impact Reduction targets aim to support the reduction of a company's potential ecotoxicity impact and identify high-impact pesticides.

Appendix E: Resources for reducing pesticide impact

Companies and farmers can consult the following sources for further guidance on how to reduce pesticide risks and their pesticide dependence, and move toward more sustainable agricultural practices, while respecting human rights and recognizing affected stakeholders:

- FAO, UNEP, and WHO guidance:
  - International Code of Conduct on Pesticide Management and revisions to the Code of Conduct;
  - Guidance on alternatives to highly hazardous pesticides (report and summary);
  - Guidance on integrated pest management for the world's major crop pests and diseases;
  - FAO and WHO Guidance on Options for Reducing Risk When Phasing Out Pesticides;
  - Synthesis Report on the Environmental and Health Impacts of Pesticides and Fertilizers and Ways to Minimize Them: Envisioning a Chemical-safe World (2022);
  - FAO Good Agricultural Practices
- Additional resources
  - Plant protection alternatives databases (e.g., CABI BioProtection Portal);
  - Fair data sharing and governance (e.g., Smallholder-oriented Data Governance Principles);
  - UN Guiding Principles on Business and Human Rights;
  - UN General Comment on Land and Economic, Social and Cultural Rights.



SCIENCE BASED
TARGETS NETWORK