

Can your project be a carbon project?

A carbon credit field guide for biochar producers



Monthly Biochar On Site Video Meet up · Wednesday, August 5, 2026 · Noon–1:30pm Pacific

Start Keeping Records

What a carbon project actually asks of you — and why what you can claim later is set by what you're recording now

Alicia Klepfer · Carbon Project Development & MRV



A bit about how I got here

- A decade on carbon projects — soil carbon and nitrogen, oil and gas methane, cattle, biochar, grasslands
- Run projects the whole way through, from first idea to credits in hand
- Built the software other developers use to run their projects
- Visited 20+ production sites and farms, and wrote the procedures crews work from
- Drafted a methodology for CAR, and comment on new ones while they're still drafts



RADICLE



**BLUE OCEAN
BARNs**



GRAIN

THE GAP, NAMED IN JULY

“There’s putting carbon in the ground ...
and there’s a carbon credit —
and the *gap between them is the MRV
and the documentation.*”

Wyatt Catron · Biochar On Site, July 2026



What Wyatt and Wihan covered in July

ALREADY COVERED IN JULY

- Which protocols exist, and how they differ from each other
- Low tech, mid tech and industrial, and what volume each can reach
- Permanence, H:C, and where the calculations come from
- What a credit costs to produce, what it sells for, and whether it pencils

WHAT TODAY ISN'T

- A recommendation of which standard to use
- A ruling on whether your project qualifies
- A repeat of July information

It is what the project asks of you — the records, the intent, the process.

What makes a high-quality carbon credit

Real

Measurable /
Quantifiable

Additional

Permanent

Verifiable

Unique

Transparent

Enforceable

Follows the Offset Quality Initiative criteria (2008) and registry program rules; ICVCM's Core Carbon Principles (2023) are the successor framework.

Good carbon accounting principles

01

Relevance

02

Completeness

03

Consistency

04

Transparency

05

Accuracy

06

Conservatism

ISO 14064-2, Principles. The first five are shared with the GHG Protocol Corporate Standard; conservatism is added for project-level quantification.

Assumptions

01 You can sell into the spot market

You don't have to clear a big corporate buyer's quality bar. The story of your project can count for more than the size of it.

02 The principles hold whichever market you sell into

Voluntary, compliance, or a company counting it toward Scope 3 — the accounting underneath is the same.

03 I'll use some words interchangeably

Credit and offset. Methodology and protocol. Standard and registry. The nuances are real, but they won't change anything today.

04 Every program uses its own vocabulary

One says listing, the next says registering. I'll describe what each step does, so you can map it onto whichever you use.

05 I'm not going deep on any one methodology

Nothing today is a determination about whether your own project qualifies.

06 This is my own reading of it

Built off my experience. But if anything I say contradicts a methodology, believe the methodology.

Breaking your operation into parts



Feedstock

What it is, where it comes from, if it has other uses



Conversion / kiln

The burn/pyrolysis step itself



Biochar / end use

What you produce and where it ends up



Carbon project pieces

What gets measured, what documents get submitted, what rules to follow



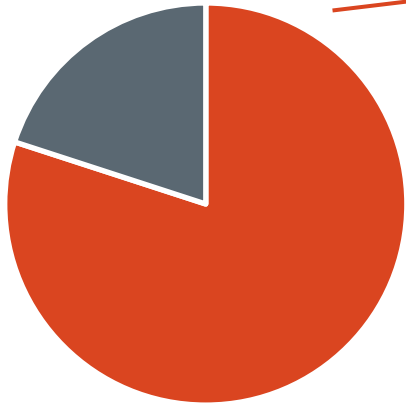
Financing

Who paid, who owns the carbon, when money moves



Project management

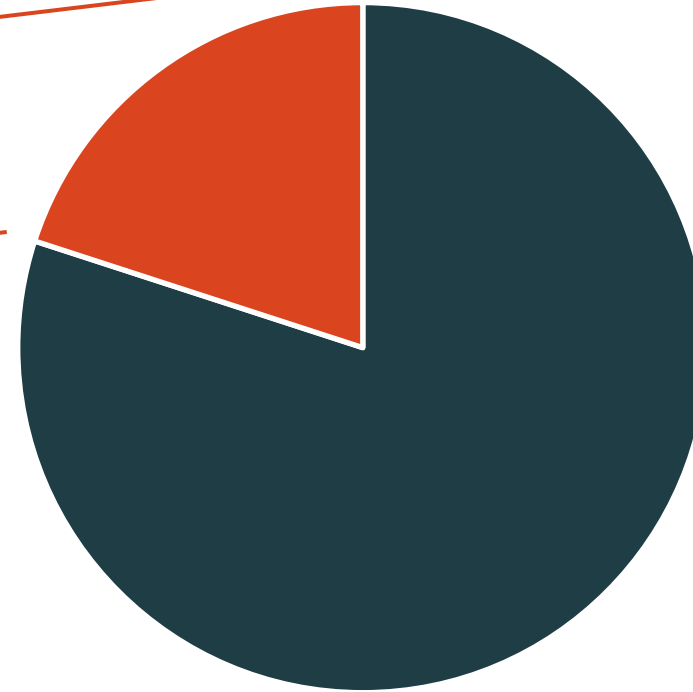
Deciding, sequencing, keeping it moving



WHERE THE QUESTIONS USUALLY START

80% — methodology and market questions

real questions,
and they decide
this part



WHERE THE WORK IS

80% — building and documenting the project

Methodology and market choices are real, and they set this last 20%.

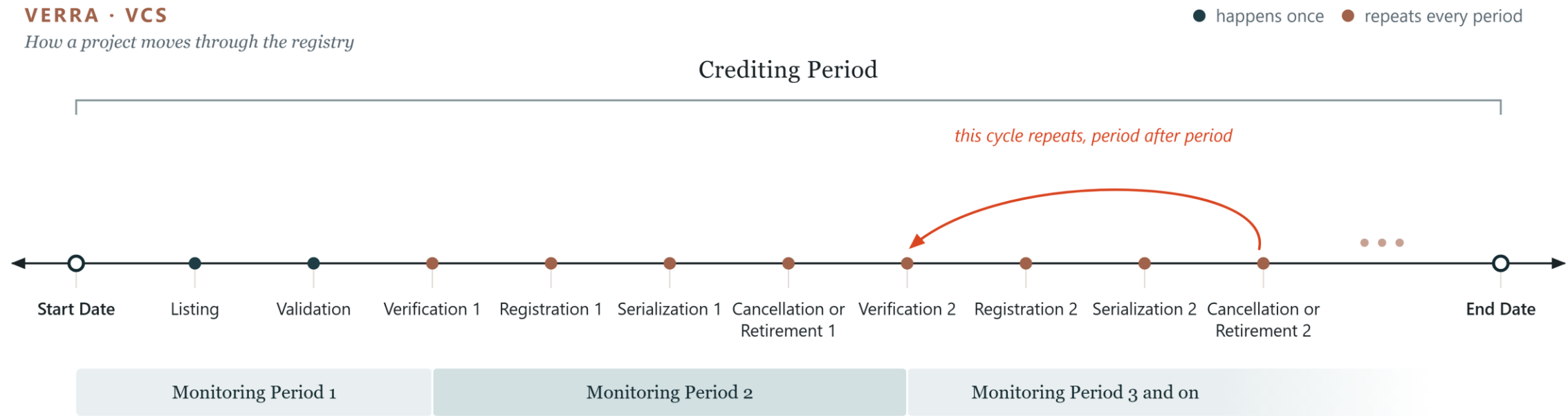
You just meet a lot of other barriers before they're what stops you.

You'll hit other barriers first

The carbon credit project process

VERRA · VCS

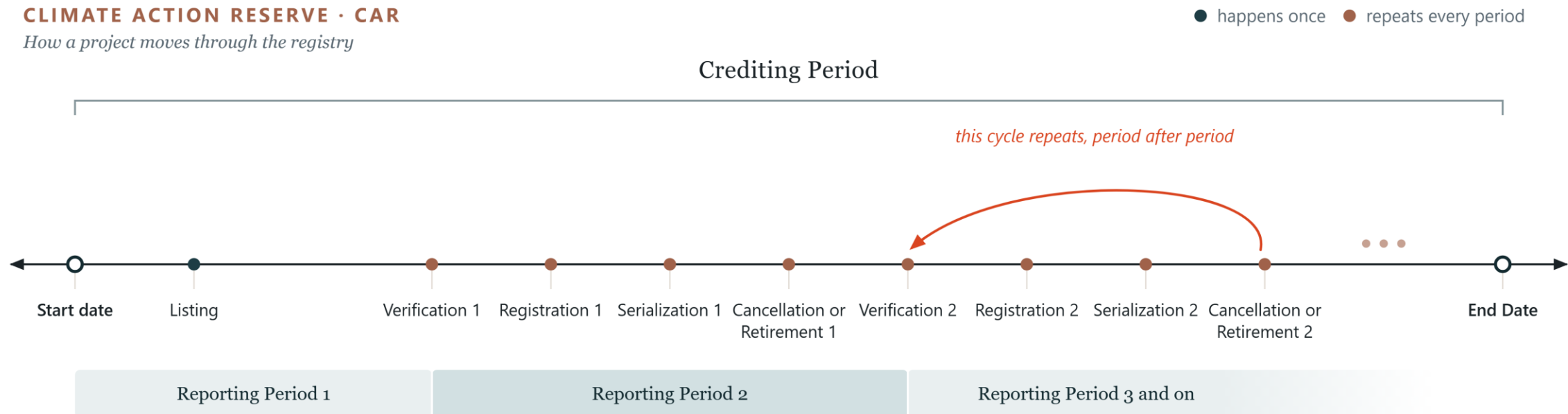
How a project moves through the registry



Similar but different

CLIMATE ACTION RESERVE · CAR

How a project moves through the registry

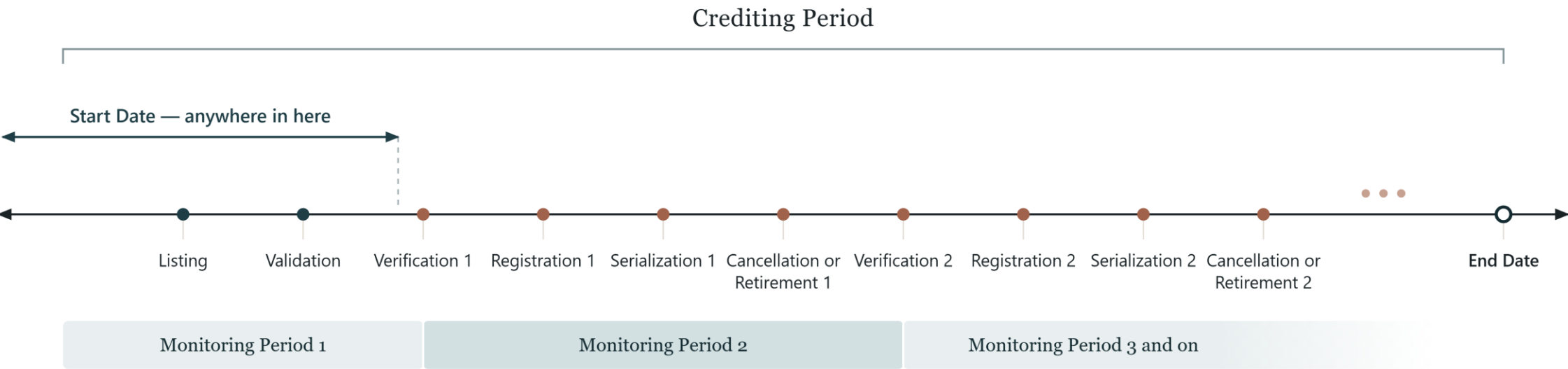


Start Dates

VERRA · VCS

The start date is a window, not a date

● happens once ● repeats every period



Start Date Rules

Start date = the first day you produced biochar.

CAR V1.0

You must list within TWELVE MONTHS.

IF YOU'VE BEEN PRODUCING LONGER THAN THAT

Can increase scale, but must deduct previous production (3 years previous, highest amount produced).

VERRA VM0044 V1.2

Validation must be complete within TWO YEARS of your start date.

IF YOU'VE BEEN PRODUCING LONGER THAN THAT

No recourse. Past two years and you are ineligible.

RAINBOW

Start date within THREE YEARS of validation. Monitoring can begin 18 months before registration.

IF YOU'VE BEEN PRODUCING LONGER THAN THAT

No recourse. Past three years and you are not eligible.

GOLD STANDARD PARC

DRAFT

Crediting reaches back a maximum of TWO YEARS before Design Certification.

IF YOU'VE BEEN PRODUCING LONGER THAN THAT

Still eligible — but production before that window earns nothing.

FROM THE PRODUCER'S SIDE

Which methodology to pick?



Where you're starting narrows the list

Not started yet

Every door is open

- No history, no start date already set
- Pick the program, then build records to fit

Scaling

Your expansion is the lever

- A new kiln or feedstock can reset the clock
- Done carelessly, it tangles what you have

Already producing

Your history does the choosing

- CAR: in, with a permanent deduction
- Verra v1.2: CAR approach in draft
- Rainbow: 18 months of reach-back

What each program would ask of you

CAR

- **A sample every production day**
And a live pool of at least ten, at all times.
- **Up to a year to configure first**
Your start date can sit 12 months after your first burn.
- **Already producing? It comes off the top**

VERRA VM0044

- **Published values can stand in for testing**
- **Greenfield only**
An existing operation may not qualify at all.
- **PROPOSED — existing producers let in**
The v2.0 draft would allow increases at existing facilities.

RAINBOW

- **Cone flame-curtain kilns only**
Wrong kiln geometry and the door is shut.
- **Mandatory dMRV app and in-kiln sensors**
Real-time temperature in every kiln, every run.

GOLD STANDARD PARC

DRAFT

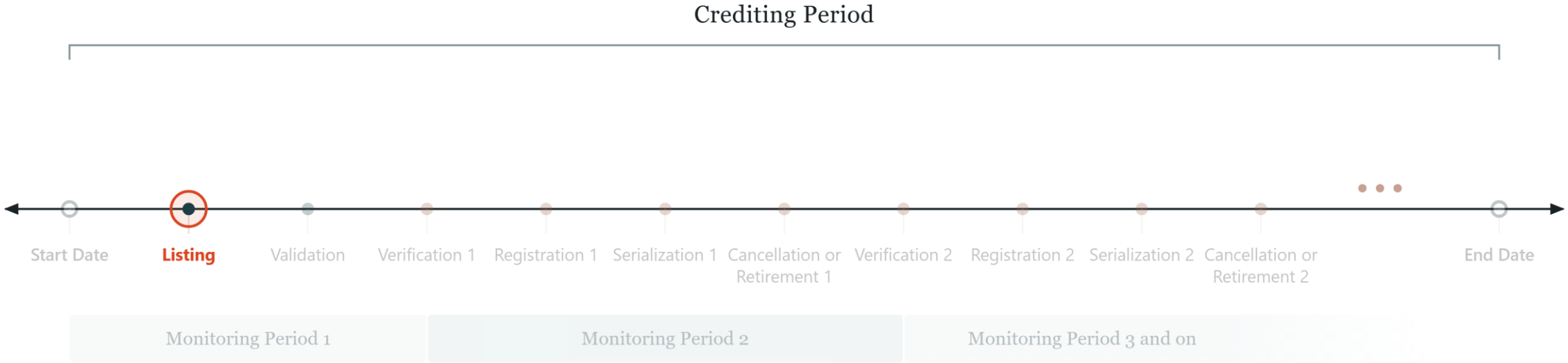
- **Built for manual kilns, on a smartphone**
Under a tonne a day, with published values and composite sampling to keep costs down.
- **Not accepted yet**
In public consultation — the specifics can still move.

Purposefully excluded

Global Artisan C-Sink (CSI) Arguably the most flame-cap-friendly path anywhere, but NOT available in the US

VERRA · VCS

How a project moves through the registry



ISO 14064-2

Section 6.2 · DESCRIBING THE PROJECT

The plan — your PDD

- Title, purpose and objectives
- Project type, and how it cuts emissions
- Location, down to the physical extent
- Conditions before you started
- Technology and expected activity level
- Risks, roles and contacts
- Impact assessment and consultation, where required
- A dated plan: start, baseline period, end, monitoring frequency

Section 6.13 · REPORTING THE PROJECT

The report — every cycle

- Who the project proponent is
- Size, location, duration, activities
- The claim itself, in tonnes CO₂e
- Verified or not, and to what assurance
- Every source and sink, and why each is in
- Project and baseline totals for the period
- Proof the reductions are not over-estimated
- Uncertainty, methods, dates, permanence

6.2 wants a dated plan, including when project activities began. The start-date trap is at ISO level — not a registry quirk.

The same content, packaged differently

Verra

A long-form narrative document, written from a template. Substantial page count.

CAR

A template form. Materially lighter to complete.

Rainbow

Generated from platform inputs — their program helps you generate the document.

You are the source for most of the content no matter which one you pick.

4 pages

Pages 1 and 3 of Qualterra’s, filed and public on the Reserve’s registry



U.S. and Canada Biochar Project Submittal Form
March 25, 2024

U.S. and Canada Biochar Project Submittal Form

Instructions: Please complete all fields as thoroughly as possible. If the project in question is still in the planning or development phase, all fields must be completed using best available data and estimates based on the proposed project design. This is an interactive Word form. Upon completion, please save this form as a PDF prior to uploading it to the Reserve. This will lock your answers and protect the document from any further changes. All fields must be completed, even if the answer is also provided elsewhere; if a field is not applicable insert N/A in the space provided. Upon approval, this form will become public.

1. Account Holder (as it appears in the Reserve software):	3Degrees Group, Inc.
2. Project Name (as it appears in the Reserve software):	Qualterra Washington State Biochar Production Program
3. Project ID #:	CAR2120
4. Protocol and modular document versions (select all that apply):	☒ U.S. and Canada Biochar Protocol v1.0 ☒ Eligible Biochar Feedstock List adopted March 19, 2024 ☒ Eligible Biochar End-use List adopted March 19, 2024
5. Project Developer:	3Degrees Group, Inc.
6. Technical Consultant(s):	N/A
7. Other Parties with a Material Interest:	Qualterra, Inc.
a. Role (e.g., project financing, technical consultant, end-user, etc.):	Biochar Producer
8. Form Completed By (name, organization):	3Degrees Group, Inc.
a. Contact Information (phone, email):	
b. Date of Form Completion:	4/9/25
9. Project Start Date (MM/DD/YYYY):	07/01/23
a. What action denotes the project start date. Refer to Section 3.2 of the protocol for start date eligibility.	Following facility relocation from their R&D site in Pullman, WA to a commercial scale facility in Cheney, WA, site commissioning was completed 6/30/23, and biochar production commenced on 7/1/23. During the R&D phase prior to this project start date a small amount of biochar was produced for testing.
b. If using the start of production to denote the start date, is the project utilizing a start-up testing period?	☒ Yes: If yes, when did the start-up testing period begin: Site commissioning occurred from April, 2023 through June, 2023 ☐ No
10. First Reporting Period End Date (MM/DD/YYYY):	TBD based on the end of the first zero-credit reporting period, as determined by the establishment of the initial parameter sampling

Please make sure you are using the latest version of this document

1

return a [Registry Project Transfer Attestation](#) form.

Project Eligibility

19. Project description (please provide one to two paragraphs).

Qualterra, Inc. is a clean ag-biotech company that has developed an innovative biomass processing technology to sustainably recycle agricultural, forestry, and municipal biomass waste, and produce a consistent-quality biochar soil amendment. In the process of producing biochar, each BPU generates renewable energy as gaseous fuel that can power a generator, deliver energy to a boiler system, and/or heat a facility located adjacent to the processing unit. The primary feedstock utilized at this facility is agricultural wheat straw waste sourced from a farm located 8 miles from the facility.

From Dec 2021 through Oct 2022 Qualterra, Inc. operated as an R&D facility in Pullman, WA. Qualterra moved to a facility in Cheney, WA capable of supporting commercial scale biochar production. From Oct 2022 through April, 2023 Qualterra implemented infrastructure changes to the facility. From April through June 2023, the facility tested the production system and underwent site commissioning, which resulted in production of a small amount of biochar. Commercial scale biochar production began in July, 2023.

20. Type of feedstock:

☒ Waste/By-Product Biomass
☐ Purpose Grown

21. Describe the known or anticipated feedstock for the project (refer to the Eligible Biochar Feedstocks List available here <https://www.climateactionreserve.org/how/protocols/ncs/biochar/dev/>):
Agricultural waste - harvest residues (wheat straw) sourced locally from a farm growing wheat.

22. What is the anticipated end-use of the biochar associated with the project? Refer to the Eligible Biochar End Use List for more information.
The planned end-use of the biochar associated with this project is direct soil amendment within the United States.

23. Describe any local, state, or federal laws, regulations, best management practices, or permitting requirements that apply to the project:
The project is in material compliance with all applicable local, state and federal laws. The project is located in Spokane County, WA, which is regulated by the Spokane Regional Clean Air Agency and the Washington State Department of Ecology (WA ECY).

Qualterra, Inc. is currently operating under Notice of Construction Approval 1893, issued by the Spokane Regional Clean Air Agency on 8/31/22. Since Qualterra, Inc. does not qualify as a major source that is expected to exceed the WA ECY threshold for hazardous air pollutants (HAPs), it is not otherwise required to obtain an air quality permit.

Qualterra, Inc. does not discharge waste directly into waters of the United States, and therefore is not regulated under the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) permit program.

The expected end-use of the biochar is soil application within the United States. The project will adhere to standards for heavy metals and toxicants for soil amendments in the relevant jurisdiction. However, if such standards are not available, the project will adhere to USDA NRCS Code 366 for all soil amendments including compost.

Qualterra Inc's biochar products (Ag Biochar and Ag Biochar Plus) are registered in Washington, and other states, as soil amendments. The Ag Biochar product is a registered organic input material with the WSDA and CDFA. The heavy metal analysis is published online here: <https://www.aapfco.org/metals.html>

24. Describe how project biochar will meet the protocol requirements for permanence as outlined in Section 3.5 of the protocol.

3

66 pages

VCS template covers all project types and the whole globe. Project is Silk Grass Biochar, VCS 5035



VCS Project Description Template, v4.3

Total estimated ERRs during the first or fixed crediting period	45,500
Total number of years	7
Average annual ERRs	6,500

1.12 Description of the Project Activity

Introduction

To better manage their agricultural and food-processing waste and support topsoil regeneration on thousands of acres of degraded farmland, Silk Grass Farms is working alongside expert consultants to construct a custom, state-of-the art biochar unit capable of pyrolyzing all of their post-processing biomass. The biochar feedstock will be agricultural wastes associated with Silk Grass Farm's farming and food-processing operations, including but not limited to citrus fruits, coconuts, cacao, avocados, mango, watermelon and other tropical fruits and vegetables. Specific biomass would include coconut shells, wood chips, husks, rinds, etc. The ARTi pyrolysis system is designed to process up to 24 tons of biomass feedstock daily and operations intend to begin in April 2024. Silk Grass Farms intends to use the biochar as soil amendments to support regenerative farming operations. Feedstocks will not travel greater distances than 200 km at any point in their lifecycle for biochar production.

Pyrolysis Unit

The main manufacturing/production technologies, systems, and equipment involved in the biochar production is an ARTi Three (3) Train Biochar Production Unit Equipped with Three (3) Train Biomass Dryer. ARTi is an international company that develops pyrolysis technologies. Their mission is to demonstrate the value of biochar as a green technology able to sequester CO2e from the atmosphere and bring life back into soils. ARTi develops complete, automated, and modular biochar production systems. Their biochar reactors are containerized, modular, and transportable systems that can house up to five pyrolysis trains per container.

The pyrolysis unit qualifies as a high-technology unit based on the following criteria: the greenhouse gases produced during pyrolysis are recovered and combusted within the system — greenhouse gases are not allowed to escape into the atmosphere; at least 70 percent of the heat energy produced by pyrolysis is used (taking into consideration heat transfer inefficiencies) to ensure that energy is recovered as well as biochar; pollution controls such as a thermal oxidizer or other emissions controls are present that meet local, national or international emission thresholds; and production temperature is measured and reported. During system startup, the pyrolysis system will utilize small quantities of butane for initial ignition which is quantified in the project emissions. The pyrolysis unit is expected to operate at temperatures up to 750 degrees Centigrade.

Production Process

10



VCS Project Description Template, v4.3

As written in Silk Grass Farm's Health, Safety, and Wellness Policy (Appendix 3), training is seen as an essential element in the raising of standards of health and safety practice. Silk Grass Enterprises Ltd will therefore ensure that all employees have had or are given adequate training for the tasks they are to perform. This is to ensure that employees are knowledgeable in their roles in producing quality products. A record of each employee's training history will be maintained at Silk Grass Enterprises' offices. As a rule, no employee will be expected to perform any task, operate any piece of equipment unless adequate training has been given, or is working under the direct supervision of some other employee or subcontractor who is so trained. Safe systems of work will be devised to indicate to all employees and subcontractors, the manner in which certain tasks are to be performed. Technical training will be provided as determined by Senior Management to Management Team. Training to employees will be channelled through the Environment Health and Safety Office.

The ARTi unit must be operated only by trained and authorized staff from ARTi. ARTi will coordinate and the training and certification procedure for this unit with Silk Grass Farms employees.

Laboratory Sampling

Silk Grass Farms will adhere to the sampling procedures outlined in the Biochar Sampling Procedures section of the International Biochar Initiative (IBI) guidelines. The two required categories for testing of biochar materials relate to basic utility properties and toxicant assessment.

Laboratory analysis of biochar shall be conducted by trained and accredited laboratory professionals following the appropriate procedures outlined for each test. Testing shall follow strict quality assurance and control (QA/QC) requirements according to standardized laboratory procedures. Laboratory professionals are expected to be trained in the relevant field of analytical chemistry and operate in professional laboratories that have received general laboratory accreditation. Such accreditation should be provided by a relevant governing body or an international standards body like the ISO. Laboratories are expected to provide information describing their internal QA/QC programs as well as their participation in laboratory accreditation programs.

Biochar testing and reporting across categories shall be performed annually, after a material change (10% or greater in total feedstock composition) or after a material change in thermochemical production parameters (+/- 50oC or residence time changes by 10%).

Biochar testing must occur before any of the following types of post-processing such as biological activation (such as organic compounds), or mixing, blending, or adding any non-biochar materials (such as compost, ash, minerals, fertilizers, manure, etc.). There will not be any post-processing of the biochar or additions of any non-biochar materials to the biochar.

Monitoring

The project has a project monitoring plan that provides a detailed plan for obtaining, recording, compiling, analysing, and assuring the quality of data and information important for quantifying and reporting project based GHG emission reductions, removals, and other pertinent project attributes. Reference Section 5.

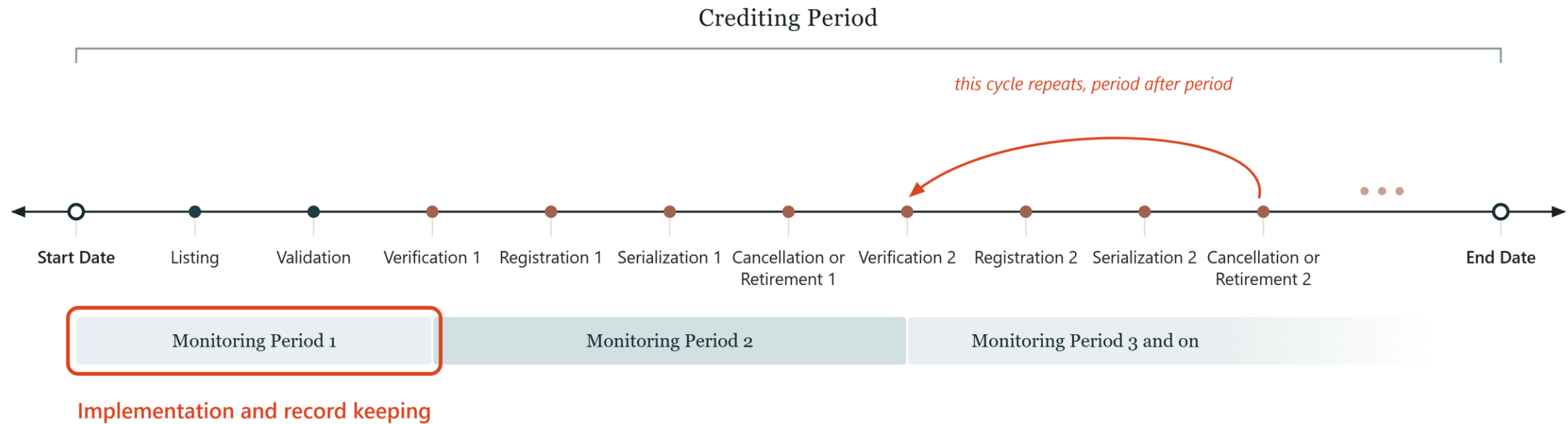
12

Where monitoring actually happens

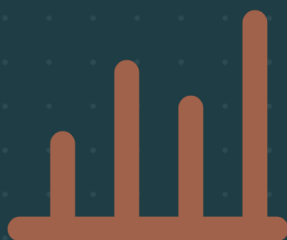
VERRA · VCS

How a project moves through the registry

● happens once ● repeats every period



MRV vs dMRV



MRV

*Monitoring, reporting,
verification*

- Monitoring — what you record at the kiln, every burn
- Reporting — assembling it for the program
- Verification — an accredited third party checks it
- For a producer, nearly all the work is the first

dMRV

*The same three, with software
doing the capture*

- Logging thermocouples, meters, recording scales
- Apps that stamp time and place onto a photo
- Platforms that lock data once uploaded
- A delivery mechanism of data PLUS a source of evidence – higher investment cost

What is mandated dMRV?

MANDATED dMRV

An approved platform, or you're not eligible.

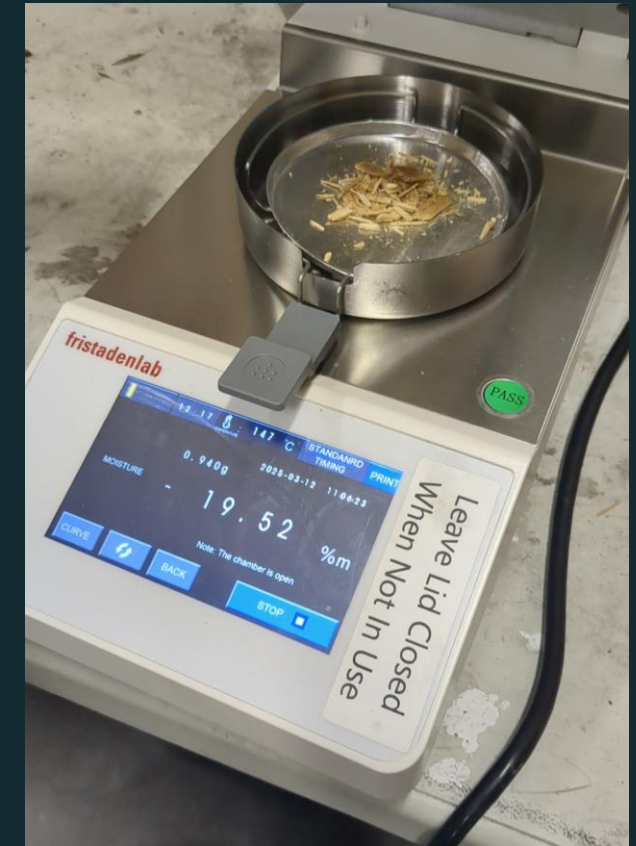
- Your own records aren't sufficient on their own
- You can pick among approved providers — you can't opt out
- The platform fee is a condition of entry, not a negotiation

WHAT ONE ACTUALLY ASKS FOR — RAINBOW'S OPEN-KILN METHODOLOGY

- A scanned QR code per kiln, and per bag
- Thermocouples logging continuously through the burn
- Every photograph carrying a timestamp and GPS
- H/C ratio and moisture, per production batch
- The platform must stop you editing any of it after upload

Caution!

Data does not equal evidence.



The difference between data and evidence

DATA

Organic carbon content =
77.8% of total dry mass

a number you typed into a form

*backed
by*
→

EVIDENCE

International BioChar Initiative (IBI)
Laboratory Tests for Certification Program

	Dry Basis Range	Units	Method
Moisture (time of analysis)	56.9	% wet wt.	ASTM D1762-84 (105c)
Bulk Density	9.9	lb/cu ft	
Organic Carbon	77.8	% of total dry mass	Dry Combust-ASTM D 4373
Hydrogen/Carbon (H:C)	0.68 0.7 Max	Molar Ratio	H dry combustion/C
Total Ash	1.2	% of total dry mass	ASTM D-1762-84
Total Nitrogen	0.38	% of total dry mass	Dry Combustion

Report specimen and values: US Biochar Initiative, "Interpreting Biochar Lab Reports", p. 3 ("Typical lab report").
Shown as published — USBI's specimen names no laboratory and no customer. irp.cdn-website.com/aefcfe85/files/uploaded/USBI_BiocharLabReport_Interpretation-1.pdf

Not all evidence is created equal



STRONGEST

Third-party generated, non-carbon purpose

Utility bills · scale tickets · lab reports · customer invoices

STRONG

System-generated, timestamped, not editable by you

Signed delivery receipts · phone photos with date and location attached · dated app records

WEAKER

Your own contemporaneous records

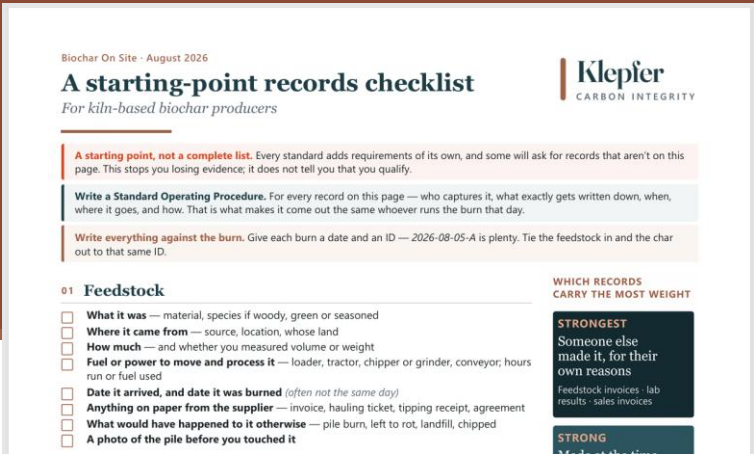
Burn logs · operator forms · photos with no date or location on them

LAST RESORT

Attestation — someone's word, written down later

Signed statements reconstructing what happened

What to start keeping



A starting point, not a complete list — it stops you losing evidence, it does not tell you that you qualify.



8

Feedstock



10

Kiln pyrolysis



9

Biochar

Write a Standard Operating Procedure

who captures each record, what exactly, when, where it goes, and how

Write everything against the burn

give every burn a date and an ID, and tie the feedstock in and the char out to it

Six of them are marked ♦ on the sheet — the metric, and how finely it is measured, differ by methodology. Recording more than you think you need keeps your options open.

Which of these carry the most weight

STRONGEST

Feedstock invoices · lab results · sales invoices

STRONG

Signed delivery receipts · phone photos with date and location attached

WEAKER

Burn logs · operator sheets · photos with no date or location

LAST RESORT

Writing it down next winter, from memory



Sampling is where the standards diverge hardest

WHAT THE RULES COVER

- How much, and how often
- Homogenising and mixing before you take it
- Sub-sampling down to what the lab receives
- Labelling, storage, and how long you retain it

WHERE THEY DISAGREE

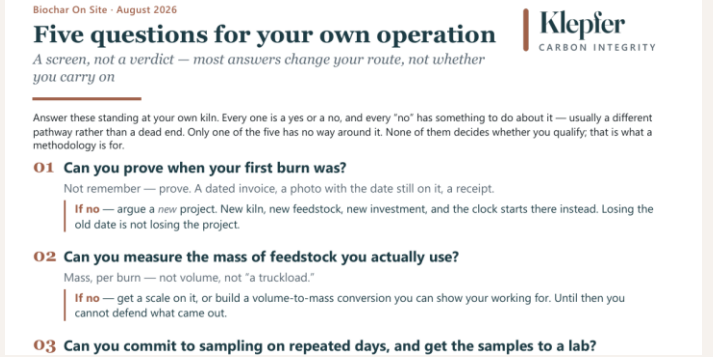
- Composite samples or grab samples
- Per batch, per production period, or per tonne
- Retention periods
- Amount of guidance given

AND SOMETIMES, NOT AT ALL

VM0044 lets a low-technology facility use default carbon values, and production temperature — measured or defaulted — instead of lab results. (Need ONE lab test to prove H:C)

Find your methodology's sampling section and read it before your first burn — then write down the procedure and use the same one every time.

Five questions to ask about your own operation



- 01 Can you prove when your first burn was?
- 02 Can you measure the mass of feedstock you actually use?
- 03 Can you commit to sampling on repeated days, and get the samples to a lab?
- 04 Can you measure both the mass of char you make and its water content?
- 05 Can you hold retention samples?

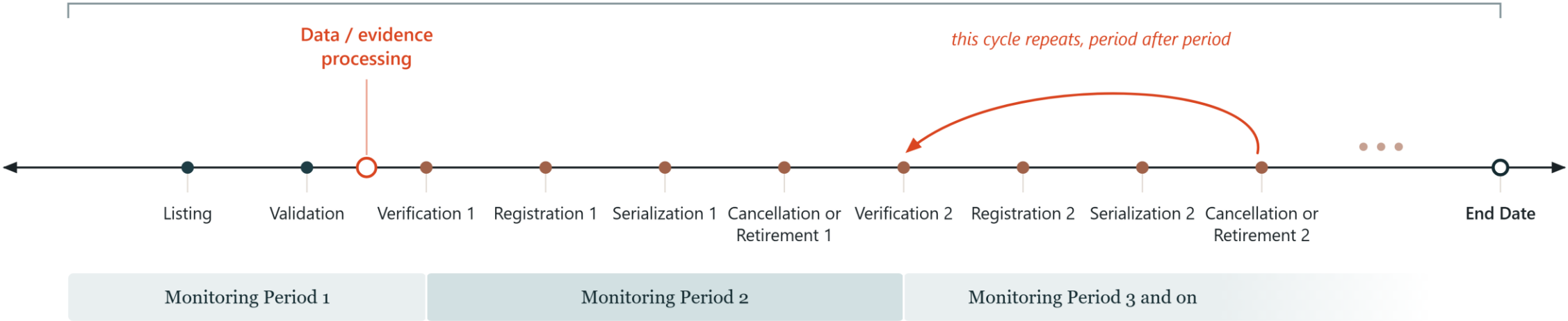
Every “no” has a route out (well, except one)

VERRA · VCS

When the evidence work actually happens

● happens once ● repeats every period

Crediting Period



The step that isn't in the acronym

M

Monitoring

Taking the readings, on schedule, forever. Feels like the work because it happens at the kiln.

(P)

Processing

Turning readings into a number someone else will defend. Nobody names it, nobody owns it, and it is where projects stall.

R

Reporting

Putting that number into the registry's format. Mostly formatting.

V

Verification

Somebody else checks it. Their labour, your records.

The first two are the hard ones, and they're the two that are yours.

Easy/fast, accurate, cheap — pick two. Worth asking of any Monitoring/MRV plan.

CLIMATE ACTION RESERVE · THE CRT CALCULATION TOOL

You fill in the blanks

Green cells are yours. Blue are calculated for you. Grey are standardised.

Biochar CRT Calculation Tool

For use with the U.S. and Canada Biochar Protocol v1.0

General Information

Reserve Project ID (CAR####)	
Project Name	
Project Owner	
Project/Crediting Period Start Date	
Crediting Period End Date	
Current Reporting Period Start Date (MM/DD/YYYY)	
Current Reporting Period End Date (MM/DD/YYYY)	

	Data entered by project developer
	Data calculated automatically
	Standardized data

Equation 5.1 - Net Quantified Removals

		Variable	Notes
Baseline Emissions (tCO ₂ e)	-	BE	No baseline emissions assumed
Project Emissions (tCO ₂ e)	-	PE	From result of Eq. 5.2
Baseline Sequestered Carbon (tCO ₂ e)	-	BC	No baseline sequestered carbon assumed
Total Project C Removals (tCO ₂ e)	-	PC	From result of Eq. 5.12
Secondary Effects (tCO ₂ e)	0	SE	From result of Eq. 5.13
Total Quantified Removals (tCO₂e)	-	QR	Total amount of CRTs to be issued for the reporting period, rounded down to integer

Equation 5.2 - Project Emissions

Emissions from feedstock production (tCO ₂ e)	-	PE _{FProd}	From result of Eq. 5.4
Emissions from feedstock transportation (tCO ₂ e)	-	PE _{FT}	From result of Eq. 5.5
Emissions from feedstock processing (tCO ₂ e)	-	PE _{FProc}	From result of Eq. 5.6
Emissions from transportation of mobile biochar production equipment (tCO ₂ e)	-	PE _{MT}	From result of Eq. 5.7
Auxiliary emissions (tCO ₂ e)	-	PE _{AE}	From result of Eq. 5.8
Emissions from thermochemical conversion (tCO ₂ e)	-	PE _{PY}	From result of Eq. 5.9
Emissions from biochar processing (tCO ₂ e)	-	PE _{BP}	From result of Eq. 5.10
Emissions from biochar transportation (tCO ₂ e)	-	PE _{BT}	From result of Eq. 5.11
Total project emissions (tCO₂e)	-	PE	Value automatically transferred to Eq. 5.1

VCS · THE MONITORING REPORT

You assemble the document

No set math. Quantify the reductions for the period, using your methodology's equations.



VCS Monitoring Report Template, v4.4

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Quantify the GHG emission reductions (reductions) and carbon dioxide removals (removals) for the monitoring period. Include all relevant equations.

Complete the tables below by vintage period (calendar year). Note that the baseline or project emissions subtotals may be negative where sinks exceed emissions. Only specify the estimated VCUs for reductions and removals separately where the applied methodology provides procedures and equations to do so.

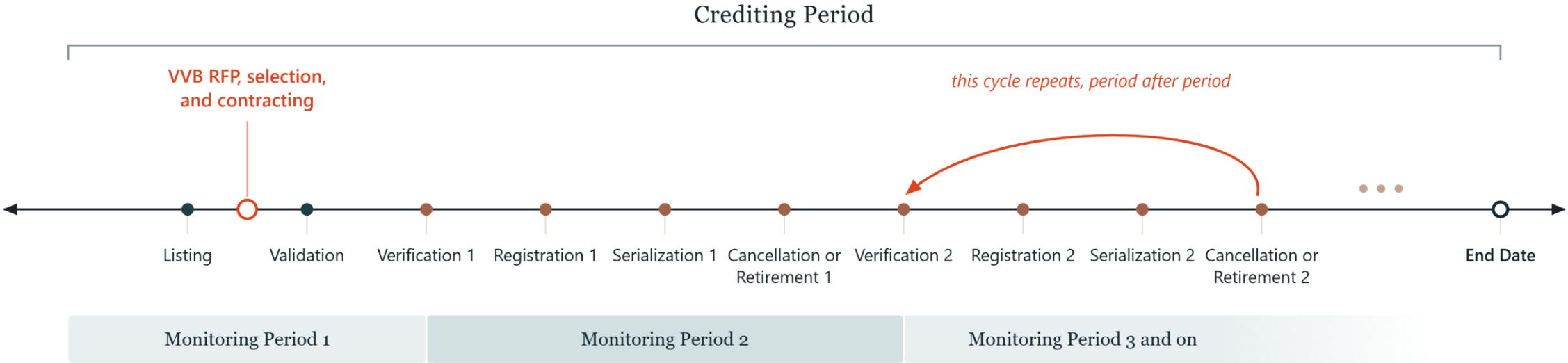
For projects that are not required to assess permanence risk, complete the table below for the project crediting period:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCUs (tCO ₂ e)	Removal VCUs (tCO ₂ e)	Total VCUs (tCO ₂ e)
DD-MMM-YYYY to 31-Dec-YYYY	Example: 50,000	Example: 20,000	Example: 10,000	Example: 10,000	Example: 10,000	Example: 20,000
01-Jan-YYYY to 31-Dec-YYYY						
01-Jan-YYYY to DD-MMM-YYYY						
...						
Total						

VERRA · VCS

When the VVB gets hired

● happens once ● repeats every period



You pick the VVB, and you pay them

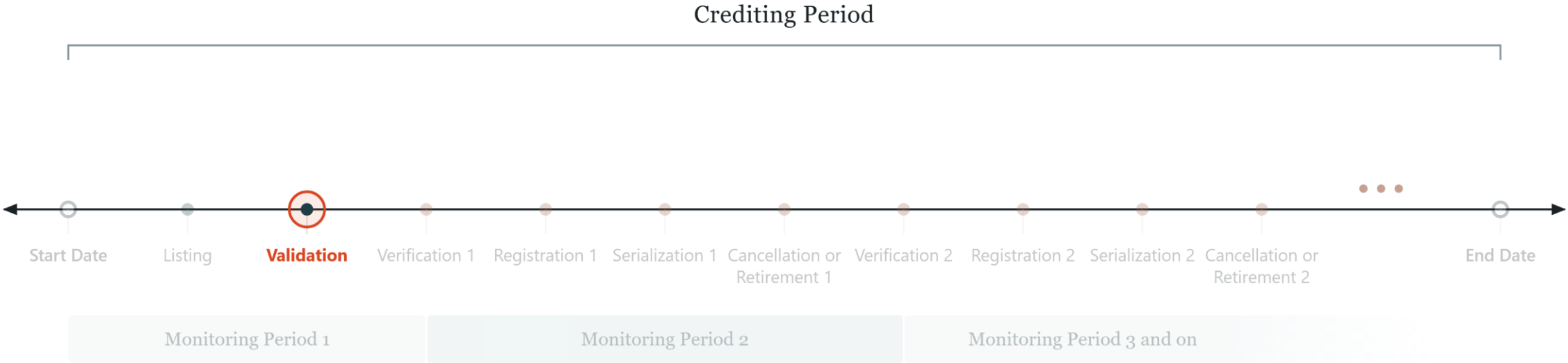
HOW IT WORKS (CAR/VCS/Rainbow)

- You choose from the standard's approved list, and you contract directly
- Send an RFP to the approved VVBs for your sector, then compare
- Puro and Isometric are the exceptions — there, the program picks for you and pays as part of service fees



VERRA · VCS

How a project moves through the registry



Validation and verification differences

VALIDATION



Is the plan sound?

- Does the project meet the rules
- Is the methodology applied correctly
- Is the baseline defensible
- Looks forward, at a plan

VERIFICATION



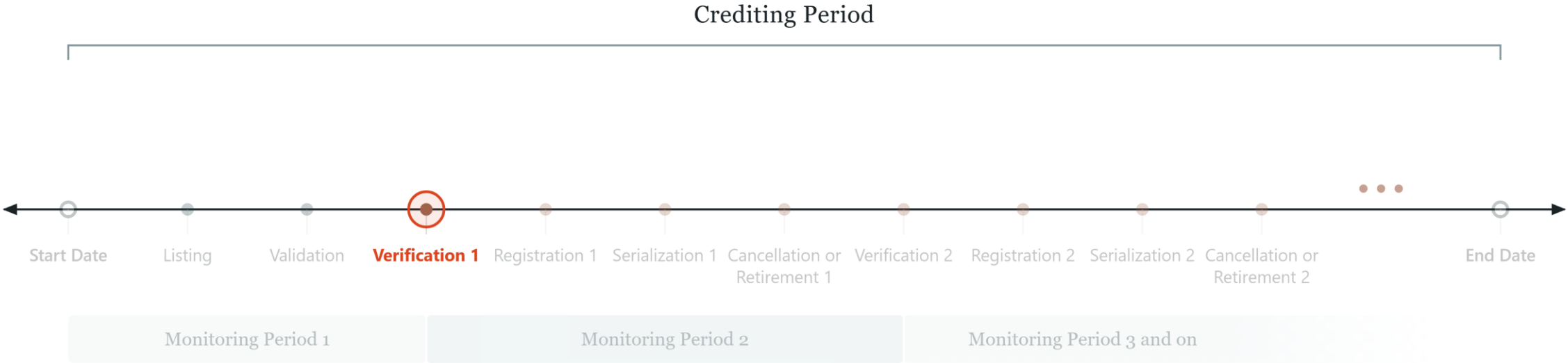
Did you actually do it?

- Are the claimed reductions real
- Do the records support the numbers
- Reasonable assurance, not absolute
- Looks backward, at a set time period

CAR has no separate validation step — it is inherent in protocol design. Under VCS you can choose to run them together.

VERRA · VCS

How a project moves through the registry



What verification actually involves

WHAT LANDS ON YOU

- A document request covering the whole reporting period – then more requested later
- They don't read everything — they pull a sample and trace it end to end

WHEN THEY COME

- An auditor will watch a burn, walk the site, and ask questions. Also will want to do interviews via phone.
- They check against your own project plan as well as the methodology

WHEN THEY FIND SOMETHING

- A finding is not a failure — most are fixable
- Volume of findings is what costs you – more findings = more scope = more delay = potentially more cost

HOW LONG IT ACTUALLY TAKES

- Usually a few months, including back and forth time
- You can organize records, you can't recreate evidence. The longest part is their review, followed by answering the hard questions they ask



How sure the verifier must be

Increasing level of assurance →

None

Limited

There is an appropriately low risk — but higher than for reasonable assurance — that the verifier expresses an incorrect conclusion.

WHAT THEY'LL SIGN

“Nothing came to our attention that looked wrong.”

**Private corporate accounting
and less formal schemes**

Reasonable

There is a reasonably low risk that the verifier expresses an incorrect conclusion. This is the highest level anyone can actually obtain.

WHAT THEY'LL SIGN

“We tested your records. In our opinion, this is right.”

**Compliance and voluntary
markets**

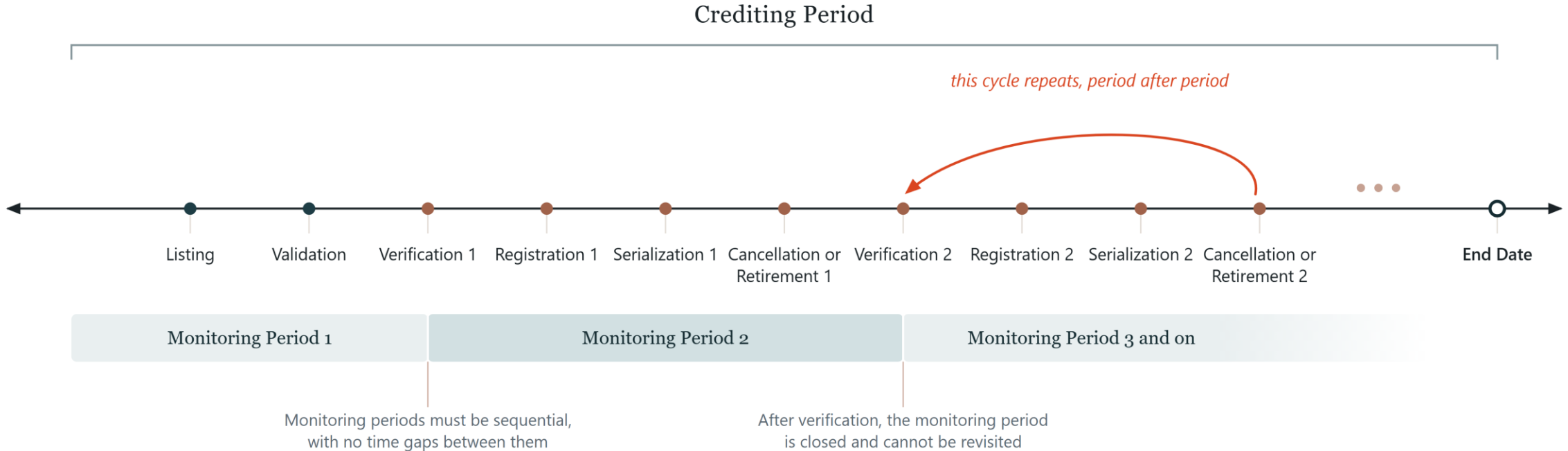
Absolute

No assurance engagement can obtain absolute assurance. Nobody will ever certify that your numbers are perfect.

VERRA · VCS

Two rules that govern every monitoring period

● happens once ● repeats every period



Two rules that close the door behind you

THE RULES

- Periods run back to back – sequential, with no gaps between them
- Once a period has been verified it is closed, and cannot be revisited – unless for major errors (worst case scenario)

WHAT THAT MEANS AT THE KILN

- A month nobody wrote down is not a month you can add back later
- The window to fix any batch closes at that period's verification
- “We’ll tidy it up before the audit” has an expiry date on it

AND WHAT THE CLOSED DOOR BUYS YOU

A verified period is settled — nobody reopens it to argue about your numbers.

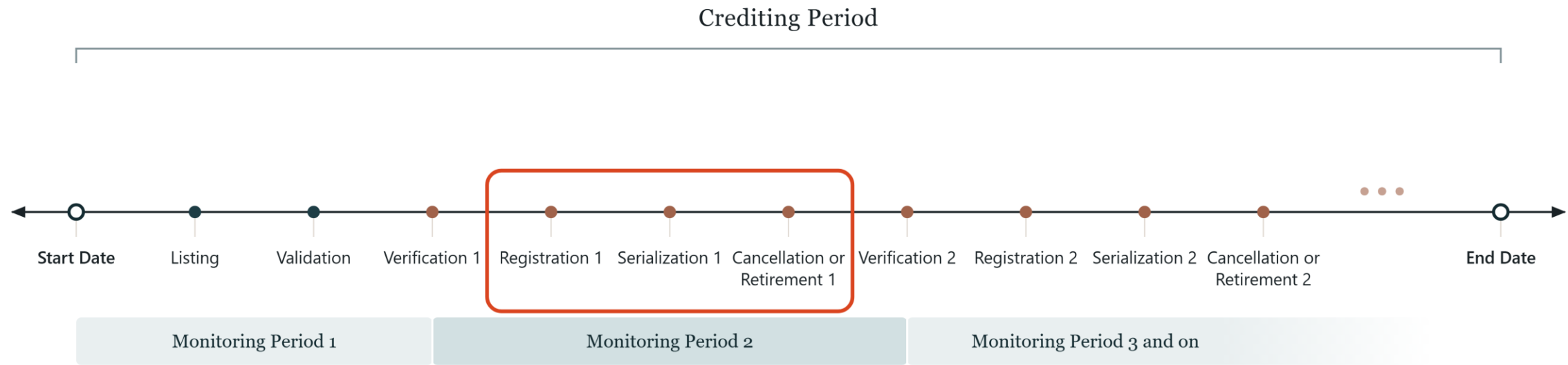
There is no version of this where you reconstruct it afterwards. That is the whole reason to start now rather than later.

What the paperwork actually unlocks

VERRA · VCS

How a project moves through the registry

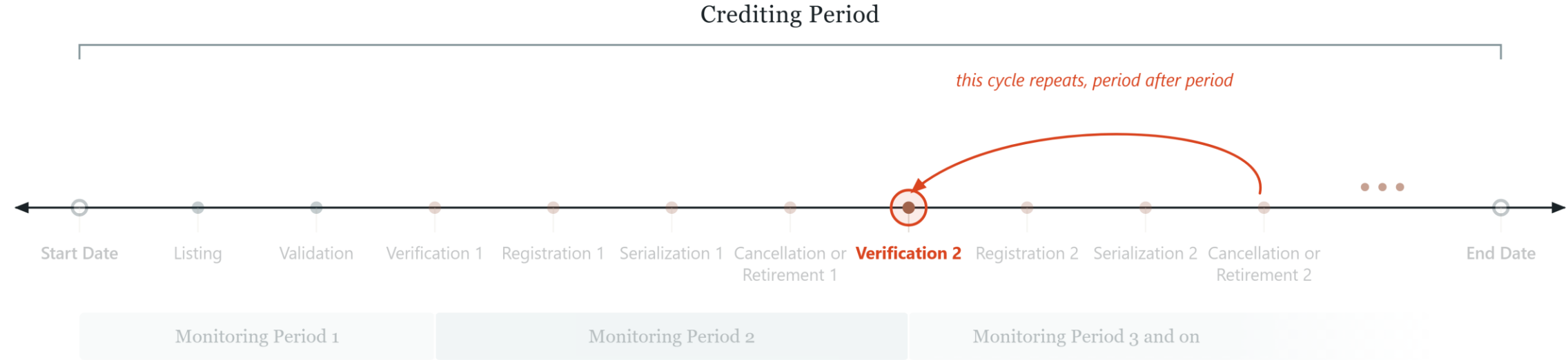
● happens once ● repeats every period



Your verification report and documentation
are your key to unlock credit issuance

VERRA · VCS

How a project moves through the registry

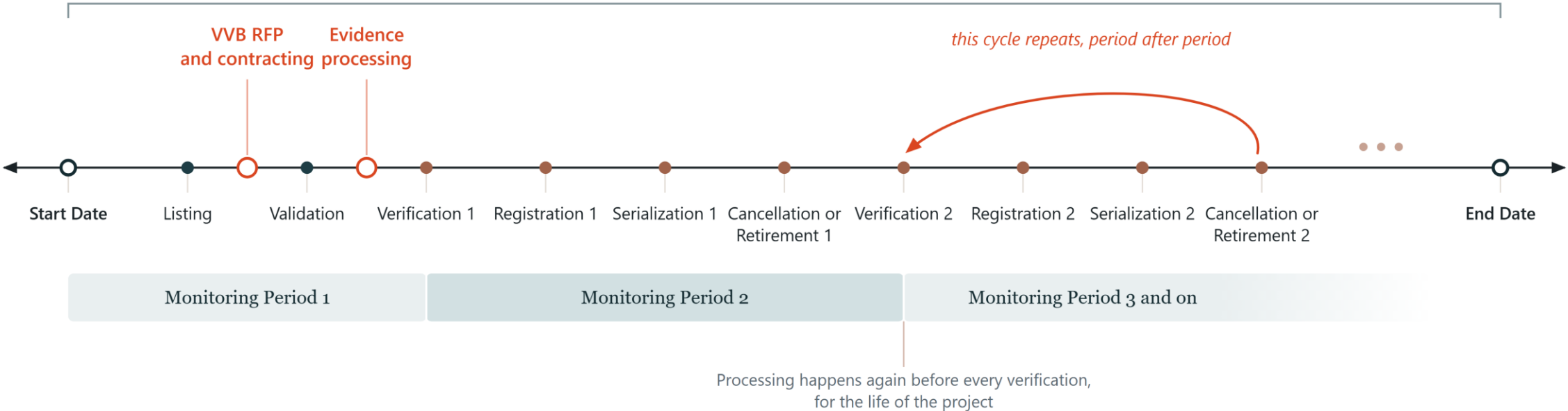


VERRA · VCS

Every stop — including the ones the registry does not name

● happens once ● repeats every period

Crediting Period



What you can get help with



PROJECT MANAGEMENT



Project management

Deciding, sequencing, chasing people, keeping it moving — largely what you are buying from a developer or aggregator



Methodology selection and guidance

The most common handoff. Ask why they recommend what they recommend



Documentation

PDD writers and report preparers exist. You still supply the operational truth



Software and platform support

Record systems, dMRV tools, getting your data into the shape a program wants



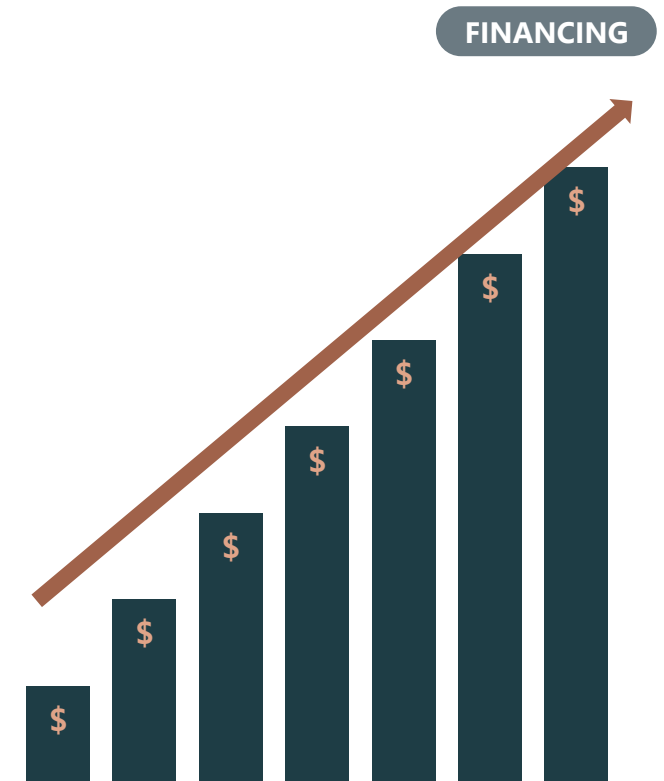
Sampling and lab logistics

Coordination, chain of custody, and getting samples where they need to be

AND WHAT STAYS YOURS

The monitoring — what gets written down at the kiln, at the time it happens.

VVB — validation and every verification	REQUIRED
Registry listing and issuance fees	REQUIRED
Operational costs	REQUIRED
dMRV platform fee	DEPENDS
Aggregator or developer share	OPTIONAL
PDD writing or consulting fee	OPTIONAL
Broker or marketplace commission	OPTIONAL



All of these can be worth it. The only mistake is not knowing which ones you agreed to.

Costs can add up

What to ask before you sign with anyone

- Who owns the credits at each step, and when does that change hands?
- What is your fee, and is it a share of credits or a fee for work?
- What happens if the project doesn't verify — who has spent what?
- What do you need from me, and what happens if I can't produce it?
- Who holds the registry account, and can I leave with my project?



Aggregation = banding together

JOB ONE

Split the fixed costs, and get support

One listing, one PDD, one VVB contract, one verification cycle — across all of you. Does bind you to group timelines.

JOB TWO

Generate a dataset none of you could alone

One kiln's data doesn't move the needle. 20 kilns' data can.

Where buyers prefer volume, 20 producers become one credit supply.

And it is already being road-tested

- A USDA Forest Service grant — Building a Biochar Market for Forest and Climate Resilience — has been running distributed burns across multiple landowners since 2024
- Multiple sites, multiple owners, one project structure. That is aggregation at small scale, being tested in the field rather than argued about on a slide
- With emissions testing running alongside it — both jobs of aggregation, in one place, already underway



What this group could actually do

If you're interested in an aggregated project, or pooling operating data to get your kiln type characterized, email

info@biocharonsite.org

The data that changes a rule is data this room is already producing.

Who convenes it, who administers it, and who gets paid — that is for the group to decide.

It is not a walk in the park. It is worth it.

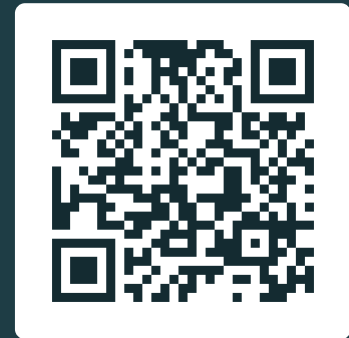
The records you keep don't change the work. They're what make it count.

Questions

ONE THING BEFORE YOU GO

TALK TO THE BOS TEAM — info@biocharonsite.org

If you'd be interested in an aggregated project, or in pooling operating data toward getting your kiln type characterized, send BOS an email!



kcarbonintegrity.com/BOS
slides + checklist and five questions

Alicia Klepfer · Klepfer Carbon Integrity
alicia@kcarbonintegrity.com · linkedin.com/in/alicia-klepfer

Ask anything — including whether a carbon project makes sense for your operation.



Defaults, or an LCA?

RUN AN LCA

More overhead, more accuracy — and a higher price

- What a large corporate buyer will ask for
- Real money, real time, and somebody competent to run it
- Your numbers, defended project by project

TAKE THE DEFAULTS

Easier to reach — and a lower price

- The standardized route, already written down
- Much faster to a first credit, and much cheaper
- You inherit whatever number the standard set

**This is a project-specific risk decision — there's no “right” answer.
The mistake is usually just not knowing you were choosing.**

Why the rules ended up this careful

WHAT HAPPENED

- Cookstoves – fraction of non-renewable biomass assumptions that couldn't be checked
- REDD+ -- self-authored baselines, and headlines that followed
- Methodologies left value choice and justification up to project developer discretion

WHAT IT PRODUCED

- A demand that everything be measured, per project, per batch
- A rational response to unverifiable claims — and not a response to biochar, where the failure mode was never the quantification method

Default values got a bad reputation, for the wrong reasons.

Default emission factors and values

- They can greatly speed up protocol decision making and adoption, as well as reduce monitoring burden
- They do have to be conservative, because they cannot be accurate to every situation
- Buyers need to be re-educated about biochar EFs specifically
- Default values need to be chosen by an unbiased, unincentivized third party
- Must be based on science and measurement to withstand scrutiny

CAR'S EMISSIONS FACTORS BY CONVERSION TYPE

CONVERSION TYPE	tCH ₄ / unit	WHO MEASURED IT
Emissions control / combustion	0/t biomass	—
Pyrolysis reactor — medium scale	0/t biomass	Sørmo 2020
Biomass boiler	0.00019/t biomass	US DOE — GREET
Air curtain burner	0.00033/t biomass	ODEQ 2023
Conservation burn (default)	0.005/t biomass	Springsteen 2015
Flame cap kiln	0.03/t biochar	Cornelissen 2023
Retort kiln	0.035/t biochar	Cornelissen 2023
Traditional kiln	0.049/t biochar	Cornelissen 2023

Top rows are per tonne of dry biomass in; kiln rows are per tonne of dry biochar out — which makes the gap wider than it looks.

Kiln not in table? Then you're **required to measure your mass of feedstock plus moisture content** to get tonnes of dry biomass.

Everyone is eligible, but not on equal terms

Standards need to hear from PDs

VM0044 v2.0 — draft out for public consultation

Open now · closes 17 August 2026 · anyone may comment

- You don't need a project, a registry account or a consultant to file a comment
- Your methane number is a lookup against the same (old) paper, Table 3 of Cornelissen 2016 study
- **Limited to kiln types in paper.** The methane emission factor per dry tonne of biochar when you're not in the table:

0.049 tCH₄/t dry biochar

1.32 tCO₂e — when your kiln type isn't in the table (there are no kiln definitions in the protocol)



HAVE COMMENTS?

15 AUGUST Send me your points

alicia@kcarbonintegrity.com — end of day, and they go in with mine.

17 AUGUST Verra's window closes

File your own through the consultation form. No project or registry account needed.

Rainbow – open kilns & methane emissions



“We’re not saying this is fixed.”

Rainbow, on the conical-kiln requirement · IBI webinar, July 2026

- Conical kiln with a flame curtain — because that is where the published methane research is, not a view about shape
- No comment period open, so there is no form to fill in right now

ROUTE ONE

Into the next iteration

Get measured numbers in front of them before the methodology is rewritten.

ROUTE TWO

A deviation

Cover non-conical designs on the strength of that same data.

Somebody is already doing the measuring

CORRIM · CIRCULAR SPRING

Emissions testing on flame-cap production, running alongside a working carbon project. Results pending.

IT IS NOT

A verdict on your kiln

Nobody assessed it and marked it down.

IT IS

A citation problem

A standard with no published number to cite takes the cautious one.

WHAT CLOSES IT

Publication

A methodology cannot cite a spreadsheet on somebody's laptop.

The testing is happening now, on the kinds of kilns in this room. Results pending is the honest part — this is live, not finished. Getting more measurements to the Standards can only help.

Where I think this should be heading

01 Defaults are the way to go for adoption

Not a compromise. The thing that lets a small producer take part at all.

02 It isn't less measuring

It is measuring once, properly, at the methodology level — not every batch at every site forever.

03 Precision has a price

It pushes credit prices up and adoption down, while a great deal of waste biomass just sits there.

04 Activity change beats decimals

And buyers need to hear that as much as the standards bodies do.

Compromise and stakeholder input makes a big difference!

ALBERTA'S CONSERVATION CROPPING PROTOCOL, 2012–2021

14 Mt

of offsets, 2007–2021

1 / 3

of all seeded acres in Alberta

\$164M

USD in value

- Withdrawn 31 December 2021 — a review found the practice was no longer additional
- It worked so well it wrote itself out of existence

THE ENTIRE QUANTIFICATION — TONNES OF CARBON PER ACRE PER YEAR

Parkland	~0.113
Dry Prairie	~0.057
Irrigated Dry Prairie	Parkland rate

Two numbers and an acreage count. No soil sampling, no lab.

What activity-based crediting looks like

Questions

TWO THINGS BEFORE YOU GO

TALK TO THE BOS TEAM

If you're interested in an aggregated project — or in pooling operating data toward getting your kiln type characterised. info@biocharonsite.org

COMMENT ON VM0044

Email me your points by end of day 15 August — or scan and submit your own to Verra by 17 August.



kcarbonintegrity.com/BOS

slides + checklist and five questions

Alicia Klepfer · Klepfer Carbon Integrity
alicia@kcarbonintegrity.com · linkedin.com/in/alicia-klepfer

Ask anything — including whether a carbon project makes sense for your operation.

