

A Strategic Roadmap to Permitting and Environmental Compliance for a Solar Manufacturing Plant in Georgia

A structured guide to EPA and EPD compliance for industrial PV manufacturing

Content Partner: J. v. G. technology GmbH

Turnkey solar module production lines – since 1997

www.jvg-thoma.com





Technical Overview: Permitting and Environmental Compliance for Georgia Solar Plants



Created as part of the PVKnowHow Knowledge Network



Prepared by J.v.G. Technology GmbH



European specialists in turnkey solar module production lines

Key Project Data

GW-sc...

12–18mo

\$150K+

3

Factory Type

Industrial solar module
factory – medium-scale

Permitting Timeline


Typical end-to-end
permitting duration

Compliance Investment

Estimated range: \$50,000–
\$150,000+ (compliance
scope only)

Key Permit Types

Air (Title V / SIP), Water
(NPDES), Waste (RCRA)

 **Region:** Georgia, USA | **Regulatory Bodies:** U.S. EPA + Georgia EPD | **Source:** PVKnowHow / J.v.G. Technology GmbH

Context: Why Georgia?

Industrial Growth Backdrop

- Georgia is a leading U.S. state for new manufacturing investment
- Multiple large-scale solar supply chain facilities announced post-IRA (2022–2024)
- Greenfield and brownfield sites both present permitting complexity
- State actively recruiting clean energy manufacturing

Regulatory Starting Point

- Federal framework: U.S. EPA sets baseline standards
- State agency: Georgia EPD administers most permits locally
- EPA has delegated NPDES authority to Georgia EPD / Dept. of Natural Resources
- Dual compliance required — federal floor + state-specific rules

The Core Challenge: Two Regulatory Layers

Federal (EPA)

- Sets national standards under Clean Air Act, Clean Water Act, RCRA
- Directly enforces where state programs are not delegated
- Oversees Title V air permits for major emission sources
- RCRA hazardous waste rules apply at federal level

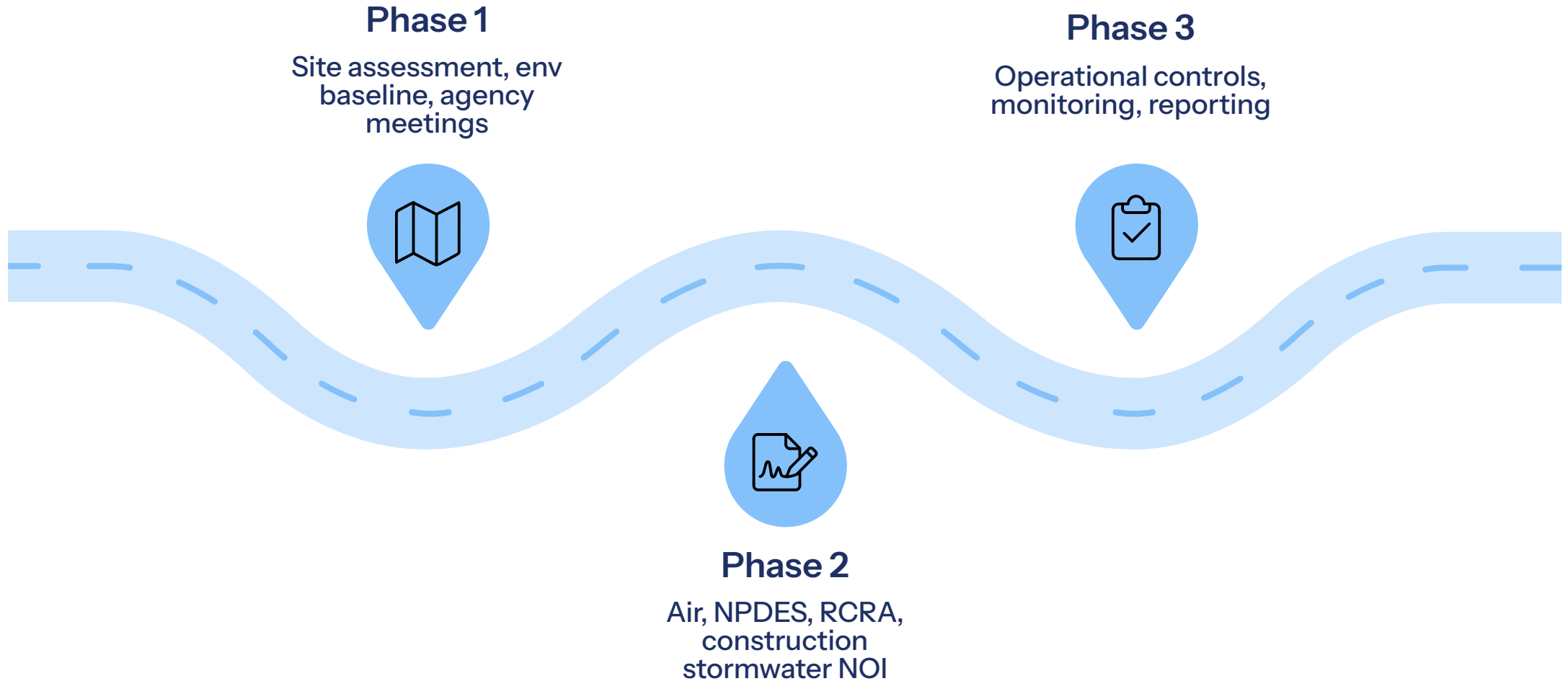
State (Georgia EPD)

- Issues most operating permits in Georgia on EPA's behalf
- Administers NPDES water discharge and stormwater permits
- Georgia Environmental Online System (GEOS) — primary submission portal
- Can add state-specific conditions beyond federal minimums

Overlap & Coordination

- Factory operators must satisfy both simultaneously
- Inconsistent timelines between agencies create scheduling risk
- Local municipal rules (e.g. stormwater) may add a third layer
- Early pre-application meetings with both agencies are critical

3-Phase Permitting Roadmap



Each phase must be sequenced carefully — delays in Phase 1 directly compress Phase 2 review windows, extending the overall 12-18 month permitting timeline. Early agency engagement is the single highest-leverage action a project team can take.

Phase 1 – Site Assessment & Pre-Application

Environmental Baseline Study

- Air quality monitoring – identify existing pollutant concentrations
- Wetlands delineation and floodplain mapping
- Soil and groundwater pre-characterization
- Proximity to sensitive receptors (schools, residential areas)

Pre-Application Agency Meetings


- Request pre-application conferences with Georgia EPD Air, Water, and Waste branches
- Confirm which permits apply to planned manufacturing processes
- Identify data gaps before formal applications are submitted
- Establish contact with regional EPA office as appropriate

Land Use & Local Approvals

- Zoning approval for manufacturing use – county / municipal level
- Industrial development bonds or incentive agreements may add conditions
- Local stormwater ordinances (e.g. green infrastructure requirements in metro areas)
- Building permits separate from environmental permits

Phase 2 – Permit Applications

Permit Type	Regulatory Basis	Issuing Authority	Typical Review Time
Air – Title V / SIP	Clean Air Act	Georgia EPD Air Protection Branch	6–12 months
Water – NPDES (Industrial)	Clean Water Act	Georgia EPD Watershed Protection Branch	4–9 months
Stormwater – Construction NOI	CWA / NPDES IGP	Georgia EPD (via GEOS)	~30 days (general permit)
Hazardous Waste – RCRA	Resource Conservation & Recovery Act	EPA / Georgia EPD	Variable – 3–12+ months

 All Georgia EPD wastewater and stormwater applications must be submitted electronically through **GEOS** (Georgia EPD Online System). Paper submissions are no longer accepted for most programs.

Environmental Risks in Solar Module Manufacturing

Air Emissions Sources

- Soldering and stringing processes — lead and flux fumes
- Encapsulant lamination — VOC outgassing from EVA/TPO
- Screen printing — solvent emissions
- Combustion from on-site heating or backup generation
- Threshold emissions determine permit class (minor vs. major source)

Water & Waste Risks

- Process wastewater from cell preparation and cleaning
- Stormwater runoff from construction and industrial activities
- Hazardous waste: lead, solvents, chemical reagents (RCRA-regulated)
- Backsheet and encapsulant waste — waste characterization required
- Improper storage of chemicals — spill prevention plans (SPCC) may apply

Common Pitfalls & Causes of Delay

Incomplete Applications


- Missing emissions calculations or process descriptions cause immediate rejection
- Incorrect SIC codes on industrial stormwater NOI delay general permit coverage
- Failure to attach required topographic maps or facility diagrams

Underestimating Timelines

- Air permit reviews routinely run 9-12 months — not 60 days
- RCRA determinations can extend beyond initial project schedules
- Public comment periods add 30-60 days to major permit applications

Operational Missteps

- Starting construction before stormwater NOI is confirmed — a common violation
- Failing to update SWPPP when site conditions change during construction
- Missing annual reporting deadlines (e.g., IGP Annual Report due Jan 31)

 Georgia EPD's GEOS portal is the mandatory submission channel for most permits. Technical issues or unfamiliarity with the platform can cause filing errors and delays — budget time for system registration and testing.

Phase 3 – Compliance Build-Out

1 — Establish Operational Controls

Install emission controls, wastewater pre-treatment, and spill containment systems as specified in permit conditions

2 — Implement Monitoring Programs

Set up continuous or periodic monitoring per permit requirements — air stack testing, effluent sampling, stormwater inspections (quarterly visual + annual lab analysis)

3 — Train Operations Staff

Environmental compliance responsibilities must be embedded in plant operations — RCRA waste handling, spill response, permit deviation reporting within 24-hour window

4 — Ongoing Reporting Obligations

Electronic reporting via NetDMR (water), GEOS (stormwater), and EPA systems — annual reports, DMRs, and deviation notices as required

The Role of Local Consultants



Local Regulatory Knowledge

Georgia EPD staff contacts, informal agency norms, and county-level zoning requirements are not documented centrally — local experience is irreplaceable



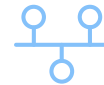
Application Quality Control

Experienced consultants reduce rejection risk by ensuring completeness of emissions inventories, process descriptions, and supporting data before submission



Agency Relationship Management

Pre-application meetings and informal consultations — most effective when facilitated by consultants with established working relationships with EPD reviewers



Schedule Integration

Permitting timelines must be synchronized with construction and equipment procurement schedules — a function that requires both technical and project management expertise

Compliance Cost Framework

1

Pre-Application & Studies

- Environmental baseline assessments: \$15,000–\$40,000
- Air dispersion modeling: \$10,000–\$25,000
- Legal and consultant fees for pre-application phase

2

Permit Application Fees & Support

- State permit application fees: variable by permit type and emissions volume
- Consultant fees for application preparation: \$20,000–\$60,000
- Total compliance investment range: **\$50,000–\$150,000+**

3

Ongoing Annual Compliance

- Annual permit fees, monitoring, reporting, and audit support
- RCRA waste characterization and disposal tracking
- Non-compliance penalties can far exceed proactive compliance costs

- Cost estimates reflect compliance-scope activities only. Capital expenditure for pollution control equipment (scrubbers, containment) is additional and project-specific.

Strategic Conclusions

1

Start Early

Permitting is a 12–18 month process
— initiate pre-application activities at project inception, not at financing close

2

Map All Obligations

Air + Water + Waste permits have independent timelines and agencies
— treat each as a parallel workstream with a single compliance coordinator

3

Leverage Expertise

An experienced turnkey manufacturing partner familiar with U.S. regulatory structure reduces learning curve and lowers risk of costly compliance delays

✓ **Key takeaway:** Environmental compliance is not a back-end task. For a medium-scale solar module factory in Georgia, permitting must be treated as a critical path item from Day 1 of project planning.

Source & Disclaimer

Document Context

- This presentation is based on composite case study scenarios
- Figures and timelines reflect real-world reference ranges, not a single project
- Prepared for educational and planning purposes only
- Not legal advice — consult qualified environmental counsel and licensed consultants

Source: PVKnowHow / J.v.G. Technology GmbH

Key References

- U.S. EPA — Clean Air Act, Clean Water Act, RCRA
- Georgia EPD — GEOS permitting portal
- Georgia NPDES Industrial General Permit (GAR050000, 2022)
- IEA / NREL — PV manufacturing technical benchmarks
- An experienced European turnkey provider — composite project reference

About the Content Partner

J. v. G. technology GmbH – The DESERT Company

Founded in 1997 in Bavaria, Germany. Family-owned engineering company specializing in turnkey solar module production lines.

More than 90 factory projects delivered worldwide.

On-site team training included – no prior manufacturing experience required.

Key areas:

Turnkey PV manufacturing lines | DESERT Technology® |
TÜV-certified module designs | Factory planning to production

www.jvg-thoma.com

Contact

J.v.G. Technology GmbH

Möningerberg 1a, 92342 Freystadt, Germany

info@jvg-thoma.de | www.jvg-thoma.com

Source:

<https://www.pvknowhow.com/countries/georgia/solar-manufacturing-permitting-georgia>

Created with the support of JvGLabs – specialist for AI systems

and AI-driven visibility. www.jvglabs.com