<https://gemini.google.com/u/1/app/bf28f389cd093e55?is_sa=1&android-min-version=301356232&ios-min-version=322.0&campaign_id=bkws&utm_source=google&utm_medium=cpc&utm_campaign=2024enUS_gemfeb&pt=9008&mt=8&ct=p-growth-sem-bkws>

<https://gemini.google.com/u/1/app/1d4834db0819faf2>

https://gemini.google.com/u/1/app/d423d51e9f40da78

### 3\. Updated Production-Ready Specification (`water\_reliability\_types\_master`)

This document details the structure, purpose, and considerations for the `water\_reliability\_types\_master` table, Version 1.2.1 (reflecting RLS role name alignment). This version incorporates full V2 audit columns, an `is\_active` flag for lifecycle management, and refined indexing and translation handling.

1\. Purpose & Primary Use-Cases

The `water\_reliability\_types\_master` table defines the different levels of reliability for natural or public water sources (e.g., "Year-round Reliable," "Seasonal - Check Locally," "Can Be Dry/Unreliable"). Its primary purpose is to provide standardized, translatable, and descriptive terms so pilgrims can make informed decisions about water planning, which is critical for their safety and comfort on the journey. Key user-story touchpoints include pilgrims assessing water source trustworthiness, understanding seasonal variations, administrators accurately classifying water source reliability, and the UI displaying clear reliability indicators.

2\. Schema

| column | data\_type | constraints | description |

| `id` | `INTEGER` | Primary Key (Generated as identity always) | Unique identifier for the water reliability type. |

| `code` | `TEXT` | Unique, Not Null, CHECK (length(`code`) > 0 AND length(`code`) &lt;= 50 AND `code` ~ '^[a-z0-9\_]+$') | Short, stable, machine-readable code (e.g., 'year\_round\_reliable', 'seasonal\_check\_locally'). Snake\_case. |

| `label` | `TEXT` | Not Null, CHECK (length(`label`) > 0 AND length(`label`) &lt;= 100) | Human-readable label for UI display (e.g., "Year-round Reliable"). Primary reference language (English) text. (Translatable via `public.translations`). |

| `description` | `TEXT` | Nullable | Optional description providing more detail or advice for this reliability level. Primary reference language (English) text. (Translatable via `public.translations`). |

| `icon\_identifier` | `TEXT` | Nullable, CHECK (`icon\_identifier` IS NULL OR length(`icon\_identifier`) &lt;= 100) | Name, class, or path for a UI icon (e.g., a green check for reliable, a yellow warning for seasonal). |

| `advisory\_level` | `SMALLINT` | Not Null, Default `0`, CHECK (`advisory\_level` >= 0 AND `advisory\_level` &lt;= 2) | Numeric level indicating caution: 0=Good/Reliable, 1=Caution/Check Locally, 2=Unreliable/Warning. For UI styling or sorting. |

| `sort\_order` | `INTEGER` | Not Null, Default `0` | Determines the display order in UI lists or filters (e.g., most reliable first). |

| `is\_active` | `BOOLEAN` | Not Null, Default `true` | True if the type is active and available for use; false if retired. |

| `created\_at` | `TIMESTAMPTZ` | Not Null, Default `now()` | Timestamp of record creation. |

| `updated\_at` | `TIMESTAMPTZ` | Not Null, Default `now()` | Timestamp of last update (auto-updated by trigger). |

| `created\_by\_profile\_id` | `UUID` | Nullable, Foreign Key to `public.profiles(id)` ON DELETE SET NULL | Profile ID of the user who created the record. |

| `updated\_by\_profile\_id` | `UUID` | Nullable, Foreign Key to `public.profiles(id)` ON DELETE SET NULL | Profile ID of the user who last updated the record. |

3\. PostgreSQL DDL

SQL

```

-- Ensure prerequisite tables are created first:

-- public.profiles (UUID id PK, roles TEXT[])

-- public.translations (for i18n)

CREATE TABLE public.water\_reliability\_types\_master (

id INTEGER GENERATED ALWAYS AS IDENTITY PRIMARY KEY,

code TEXT UNIQUE NOT NULL CHECK (length(code) > 0 AND length(code) <= 50 AND code ~ '^[a-z0-9\_]+$'),

label TEXT NOT NULL CHECK (length(label) > 0 AND length(label) <= 100),

description TEXT NULL,

icon\_identifier TEXT NULL CHECK (icon\_identifier IS NULL OR length(icon\_identifier) <= 100),

advisory\_level SMALLINT NOT NULL DEFAULT 0 CHECK (advisory\_level >= 0 AND advisory\_level <= 2), -- 0=Good, 1=Caution, 2=Warning [cite: 550, 551]

sort\_order INTEGER NOT NULL DEFAULT 0,

is\_active BOOLEAN NOT NULL DEFAULT true,

created\_at TIMESTAMPTZ NOT NULL DEFAULT now(),

updated\_at TIMESTAMPTZ NOT NULL DEFAULT now(),

created\_by\_profile\_id UUID NULL REFERENCES public.profiles(id) ON DELETE SET NULL,

updated\_by\_profile\_id UUID NULL REFERENCES public.profiles(id) ON DELETE SET NULL

);

COMMENT ON TABLE public.water\_reliability\_types\_master IS 'Master list of reliability levels for natural/public water sources. `label` and `description` are translatable. Version 1.2.1';

COMMENT ON COLUMN public.water\_reliability\_types\_master.id IS 'Unique identifier for the water reliability type.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.code IS 'Short, stable, machine-readable code (snake\_case). Max 50 chars. E.g., ''year\_round\_reliable''.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.label IS 'Human-readable label for UI display. Primary reference language (English) text. (Translatable via public.translations). Max 100 chars.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.description IS 'Optional description/advice for this reliability level. Primary reference language (English) text. (Translatable via public.translations).';

COMMENT ON COLUMN public.water\_reliability\_types\_master.icon\_identifier IS 'Name, class, or path for a UI icon. Max 100 chars.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.advisory\_level IS 'Numeric level indicating caution: 0=Good/Reliable, 1=Caution/Check Locally, 2=Unreliable/Warning. For UI styling/sorting.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.sort\_order IS 'Determines the display order in UI lists or filters.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.is\_active IS 'True if the type is active and available for use; false if retired. Defaults to true.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.created\_at IS 'Timestamp of record creation.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.updated\_at IS 'Timestamp of last update (auto-updated by trigger).';

COMMENT ON COLUMN public.water\_reliability\_types\_master.created\_by\_profile\_id IS 'Profile ID of the user who created the record. FK to profiles.id.';

COMMENT ON COLUMN public.water\_reliability\_types\_master.updated\_by\_profile\_id IS 'Profile ID of the user who last updated the record. FK to profiles.id.';

-- Triggers & Functions

CREATE TRIGGER trigger\_water\_reliability\_types\_master\_set\_updated\_at

BEFORE UPDATE ON public.water\_reliability\_types\_master

FOR EACH ROW

EXECUTE FUNCTION public.set\_current\_timestamp\_updated\_at();

COMMENT ON TRIGGER trigger\_water\_reliability\_types\_master\_set\_updated\_at ON public.water\_reliability\_types\_master IS 'Trigger to automatically update updated\_at timestamp on row modification.';

CREATE OR REPLACE FUNCTION public.cleanup\_water\_reliability\_type\_translations()

RETURNS TRIGGER AS $$

BEGIN

DELETE FROM public.translations

WHERE table\_identifier = 'water\_reliability\_types\_master'

AND row\_foreign\_key = OLD.id::TEXT;

RETURN OLD;

END;

$$ LANGUAGE plpgsql SECURITY DEFINER;

CREATE TRIGGER trigger\_cleanup\_water\_reliability\_type\_translations

AFTER DELETE ON public.water\_reliability\_types\_master

FOR EACH ROW

EXECUTE FUNCTION public.cleanup\_water\_reliability\_type\_translations();

COMMENT ON TRIGGER trigger\_cleanup\_water\_reliability\_type\_translations ON public.water\_reliability\_types\_master IS 'Cleans up orphaned translations from public.translations when a water\_reliability\_types\_master record is deleted.';

-- Indexes

CREATE INDEX IF NOT EXISTS idx\_wrtm\_is\_active ON public.water\_reliability\_types\_master(is\_active);

CREATE INDEX IF NOT EXISTS idx\_wrtm\_sort\_order ON public.water\_reliability\_types\_master(sort\_order);

CREATE INDEX IF NOT EXISTS idx\_wrtm\_advisory\_level ON public.water\_reliability\_types\_master(advisory\_level);

CREATE INDEX IF NOT EXISTS idx\_wrtm\_created\_by ON public.water\_reliability\_types\_master(created\_by\_profile\_id) WHERE created\_by\_profile\_id IS NOT NULL;

CREATE INDEX IF NOT EXISTS idx\_wrtm\_updated\_by ON public.water\_reliability\_types\_master(updated\_by\_profile\_id) WHERE updated\_by\_profile\_id IS NOT NULL;

-- RLS Policies

ALTER TABLE public.water\_reliability\_types\_master ENABLE ROW LEVEL SECURITY;

CREATE POLICY "Allow public read access to active water reliability types"

ON public.water\_reliability\_types\_master FOR SELECT

USING (is\_active = true);

CREATE POLICY "Allow platform\_admins to manage water reliability types"

ON public.water\_reliability\_types\_master FOR ALL

USING (

(SELECT public.has\_role\_on\_profile(auth.uid(), 'platform\_admin'))

) WITH CHECK (

(SELECT public.has\_role\_on\_profile(auth.uid(), 'platform\_admin'))

);

```

4\. JSON Schema Mirror

(Reflects the schema table in Section 2)

JSON

```

{

"title": "water\_reliability\_type\_master",

"description": "Master list of reliability levels for natural/public water sources. `label` and `description` are translatable. Version 1.2.1",

"type": "object",

"properties": {

"id": {

"type": "integer",

"description": "Unique identifier for the water reliability type. Primary Key.",

"readOnly": true

},

"code": {

"type": "string",

"description": "Short, stable, machine-readable code (snake\_case). Max 50 chars. E.g., 'year\_round\_reliable'.",

"pattern": "^[a-z0-9\_]+$",

"maxLength": 50

},

"label": {

"type": "string",

"description": "Human-readable label for UI display. Primary reference language (English) text. (Translatable via public.translations). Max 100 chars.",

"maxLength": 100

},

"description": {

"type": ["string", "null"],

"description": "Optional description/advice for this reliability level. Primary reference language (English) text. (Translatable via public.translations)."

},

"icon\_identifier": {

"type": ["string", "null"],

"maxLength": 100,

"description": "Name, class, or path for a UI icon (e.g., a green check for reliable)."

},

"advisory\_level": {

"type": "integer",

"format": "int16",

"default": 0,

"minimum": 0,

"maximum": 2,

"description": "Numeric level indicating caution: 0=Good/Reliable, 1=Caution/Check Locally, 2=Unreliable/Warning. For UI styling or sorting."

},

"sort\_order": {

"type": "integer",

"default": 0,

"description": "Determines the display order in UI lists or filters (e.g., most reliable first)."

},

"is\_active": {

"type": "boolean",

"default": true,

"description": "True if the type is active and available for use; false if retired."

},

"created\_at": {

"type": "string",

"format": "date-time",

"description": "Timestamp of record creation.",

"readOnly": true

},

"updated\_at": {

"type": "string",

"format": "date-time",

"description": "Timestamp of last update (auto-updated by trigger).",

"readOnly": true

},

"created\_by\_profile\_id": {

"type": ["string", "null"],

"format": "uuid",

"description": "Profile ID of the user who created the record."

},

"updated\_by\_profile\_id": {

"type": ["string", "null"],

"format": "uuid",

"description": "Profile ID of the user who last updated the record."

}

},

"required": [

"code",

"label",

"advisory\_level",

"sort\_order",

"is\_active",

"created\_at",

"updated\_at"

]

}

```

5\. Relationships & Integrity

- Primary Key: `id` (`INTEGER`).

- Unique Constraint: `code` must be unique and follow the defined pattern.

- Foreign Key References FROM other tables: `food\_water\_sources\_details.water\_reliability\_id` references `water\_reliability\_types\_master.id` (ON DELETE SET NULL). The `food\_water\_sources\_details` table includes a trigger to ensure the referenced `water\_reliability\_types\_master` record has `is\_active = true`.

- Foreign Key References TO other tables:

- `created\_by\_profile\_id` REFERENCES `public.profiles(id)` ON DELETE SET NULL.

- `updated\_by\_profile\_id` REFERENCES `public.profiles(id)` ON DELETE SET NULL.

6\. Multilingual Strategy

- Translatable Fields: `label` and `description`. These columns store their content in the primary reference language (English). They are designated as translatable via the central `public.translations` table, where translations into other languages are stored.

- Non-Translatable Fields: `code` is a stable system identifier and is not translated. `advisory\_level`, `sort\_order`, and `is\_active` are structural/flag fields and not translatable text. `icon\_identifier` is a system value.

- Orphan Cleanup: An `AFTER DELETE` trigger (`trigger\_cleanup\_water\_reliability\_type\_translations`) is implemented. It calls `public.cleanup\_water\_reliability\_type\_translations` to remove any orphaned entries from `public.translations` when a `water\_reliability\_types\_master` record is deleted, ensuring data consistency.

7\. Role-Based Workflow & RLS Notes

- Content Management: This master table is typically managed by `platform\_admin` users who define and maintain the canonical list of water reliability classifications for the entire platform.

- Lifecycle: Reliability types are "retired" by setting their `is\_active` flag to `false`. Physical deletion of a record will set the foreign key in `food\_water\_sources\_details.water\_reliability\_id` to `NULL` if any food/water source detail entry is actively using that type. The "active check" trigger on `food\_water\_sources\_details` also prevents linking to inactive types.

- RLS Policies:

- Row-Level Security is enabled.

- Public Users (`SELECT`): Can read all `water\_reliability\_types\_master` records where `is\_active = true`.

- Authenticated Users (`platform\_admin` role via `public.has\_role\_on\_profile` helper): Have `ALL` permissions (INSERT, SELECT, UPDATE, DELETE) to manage these types.

8\. ENUM vs Lookup Discussion

- Decision: This `water\_reliability\_types\_master` table correctly promotes an original `water\_reliability\_enum` concept into a full V2-compliant lookup table.

- Reasoning: This classification is critical for pilgrim safety. A lookup table allows for richer, translatable `label` and `description` fields (important for conveying nuances like "check locally"), association of distinct `icon\_identifier` values, an `advisory\_level` for programmatic UI styling (e.g., color-coding reliability), an `is\_active` flag for lifecycle management, `sort\_order` for consistent presentation, and standard audit columns. This provides significantly more flexibility and control than a hardcoded ENUM.

9\. UI/UX Enablement

- `label` (translated): Used for clearly displaying the reliability status of a water source to users.

- `description` (translated): Can be used for tooltips or expanded information sections in the UI to help pilgrims understand the implications and any necessary precautions for a given reliability status (e.g., advice to boil or filter water if status is "seasonal - check locally").

- `icon\_identifier`: Drives the display of map icons or list icons to visually communicate water reliability at a glance (e.g., a green check for reliable, a yellow warning icon for seasonal, a red cross for not potable).

- `advisory\_level`: Allows the UI to programmatically apply styling, such as color-coding (e.g., green, yellow, red based on levels 0, 1, 2) or other visual cues to rank or emphasize reliability levels.

- `sort\_order`: Ensures that reliability types are presented in a logical and consistent order in UI elements like filter dropdowns or legends, typically from most reliable to least reliable.

- `is\_active`: The UI should primarily present and allow filtering/selection based on active reliability types.

10\. Key Considerations & Definitions

- Actionable Advice: The `label` and `description` fields (and their translations) should aim to provide clear, unambiguous, and actionable advice to pilgrims regarding water safety and planning (e.g., "Boil or filter if 'check locally'").

- Iconography: Consistent and intuitive icons for each `icon\_identifier` are key for quick visual assessment by pilgrims on maps or lists. The meaning of each icon should be clear and possibly explained in a legend.

- `unknown\_reliability` Type: The inclusion of a type like 'unknown\_reliability' in the seed data is important as a default or fallback if the reliability information for a specific water source is missing or has not yet been verified. This helps manage data completeness and user expectations.

- Seed Data Accuracy: The initial seed data must accurately reflect the intended meaning and advisory level for each reliability code. These definitions directly impact pilgrim safety.

11\. Scalability & Future-Proofing

- Manageable List: The number of distinct water reliability types will be small and relatively stable, ensuring the table remains easy to manage and queries against it are performant.

- Flexibility: The lookup table structure makes it easy to add more descriptive fields, refine advice, or even add new reliability categories in the future if needed, without requiring schema changes to other dependent tables like `food\_water\_sources\_details`.

- Audit Fields & Lifecycle: Full audit columns and the `is\_active` flag provide a robust mechanism for tracking changes and managing the lifecycle of these reliability classifications.

12\. Next-Action Checklist

- 🔴 Verify Prerequisite Tables: Confirm `public.profiles` and `public.translations` tables are V2 compliant and exist.

- 🔴 Implement `water\_reliability\_types\_master` Table: Execute the DDL for Version 1.2.1 as specified, ensuring RLS policies use the correct role names (e.g., `platform\_admin`).

- 🔴 Apply Triggers: Ensure the `set\_current\_timestamp\_updated\_at` trigger (using a standard helper function) and the `trigger\_cleanup\_water\_reliability\_type\_translations` are created and correctly applied to the table.

- 🔴 Initial Population / Seed Data: Insert the defined reliability types using the provided seed data examples. For each seed record, ensure `is\_active` is set to `true` and `created\_by\_profile\_id` is populated with a designated system administrator's profile ID.

- 🟠 RLS Helper Functions: Ensure that helper functions like `public.has\_role\_on\_profile(auth.uid(), 'role\_name')` are defined, secure, and used consistently in RLS policies.

- 🟠 RLS Policies: Implement and thoroughly test the RLS policies defined for this table.

- 🟢 Icon Design and Coordination: Develop or source appropriate icons for each `icon\_identifier` defined in the seed data and coordinate these with the UI/UX team for consistent implementation and understanding.

- 🟢 Translation Entries: Prepare initial English entries for all translatable fields (`label`, `description`) in the `public.translations` table, ensuring they are correctly linked by `table\_identifier` ('water\_reliability\_types\_master'), `column\_identifier` ('label' or 'description'), and `row\_foreign\_key` (the `id` of the master record).