Government of **Western Australia**
Department of **Water and Environmental Regulation**

Spring exemptions

Field guide

April 2023

Summary

This field guide is provided to assist landowners and occupiers of land with identification of a spring, and when a spring exemption applies under the *Rights in Water and Irrigation Act 1914*.

This field guide should only be used after you have read and are familiar with the definitions and guidance provided through the *Guideline: Spring exemptions*.

The field guide contains chapters 6 and 7 and Appendix 2 of the *Guideline: Spring exemptions*. It may be printed for reference in the field when undertaking a spring exemption self-assessment.

Relevant considerations to identify a spring

How to identify a section 5(1)(a) spring

To constitute a spring under section 5(1)(a), the water must naturally rise to the surface of the land and flow away over the surface of the land from the point at which the water reaches the surface. This makes it different from a wetland, soak, reservoir or other body of standing water (see consideration 2 in the *Self-assessment* section of this field guide).

A discharge of underground water directly into a watercourse, wetland, reservoir or other body of water is not a section 5(1)(a) spring.

For example, where a spring is located in the bed of a watercourse, it is not a section 5(1)(a) spring, as the spring water does not flow away over the surface of the land, but instead will be discharging directly into the watercourse.

See the *Self-assessment* section of this field guide for illustrated examples of springs.

How to help identify watercourses

A watercourse will be visible in the landscape and have a bed or bed and banks[1], although bank height or bed width may vary. Watercourses vary in size and may be indicated by the presence of biological, hydrological and physical characteristics.

Watercourses may be more obvious in some land settings than others. Minor watercourses in cleared land can be observed as a line of depression in the landscape (a shallow, low-gradient channel) that is able to confine water and provide a flow pathway from areas of high to low elevation.

[1] A bank is the sides of a watercourse channel. It extends upwards from the bed (base) of a watercourse until there is a change in gradient to a slope consistent with the surrounding terrain. The bank height can vary along a watercourse and represents the maximum height at which flow is contained within the watercourse. Bank heights can be as low as is required to confine water to a flow path. Banks can be natural features or artificially modified or created because of interference. Banks may also be absent or difficult to identify along sections of a watercourse because of interference (such as land clearing, cropping or cattle accessing a watercourse and trampling a bank).

A watercourse forms where surface runoff (which may occur as sheet flow[2]) and/or subsurface flow[3] collect to flow in a single direction across the land surface.

An example is rain running down opposing hillsides over the land surface (surface runoff) and through the soil below the surface (subsurface flow), meeting in the valley or depression between the hillsides and moving together downslope to form a watercourse. At this low point in the landscape, water collecting from multiple directions increases in volume and velocity. This water moves downslope because of gravity, collecting more water as it flows, forming a watercourse through erosion (Figure 1). With movement downslope, a watercourse may receive additional flow from catchment runoff (surface runoff and subsurface flow) and smaller watercourses (tributaries) that flow into the larger watercourse.

Where a watercourse has been artificially improved or altered, it is still deemed by the Act to be a watercourse. These alterations can include those resulting from land management practices.

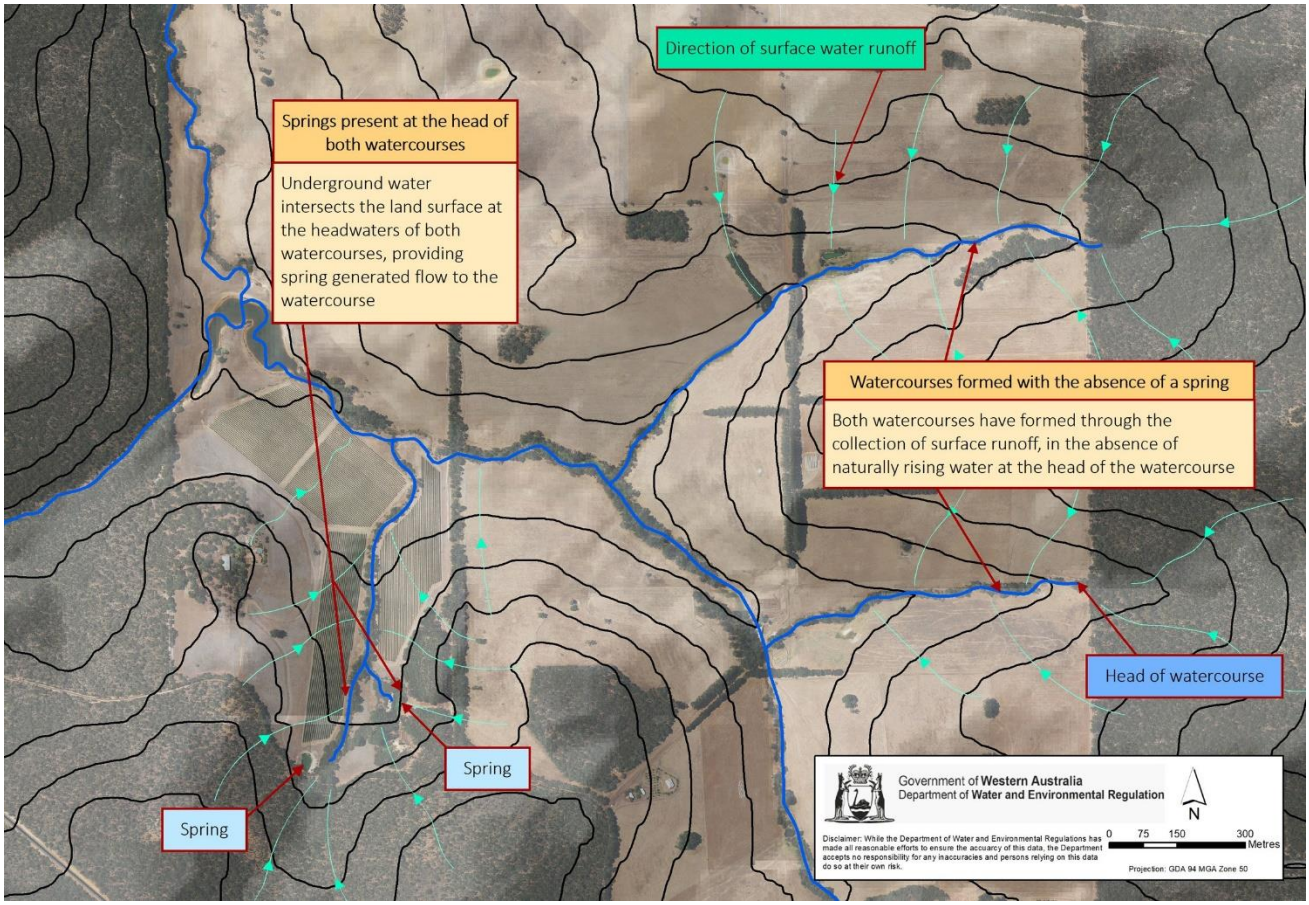

Figure 1 Watercourses are present in the landscape where surface runoff and/or subsurface flow collect to flow in a single direction across the land surface, and may or may not have a spring at the head.

2 Sheet flow is where water flows in a uniform direction across the landscape and is not confined to a channel. Most rainfall runoff occurs as sheet flow – a film of water spread broadly across the soil surface – and has low volume, velocity and energy.

3 Subsurface flow is water that moves below the land surface.

Occasional or intermittent flow

The definition of ‘watercourse’ under the Act is broader than the common law definition. One example of this is the inclusion of the concept that the flow in a watercourse can be intermittent or occasional and still be considered a watercourse under the Act.

The department considers that the terms ‘intermittent flow’ and ‘occasional flow’ simply mean that flow is not continuous, with intermittent flow occurring at a higher frequency than occasional flow. The pattern, intensity and duration of rainfall has a significant impact on when and for how long many watercourses in Western Australia flow. Watercourses need not flow continuously; they may flow intermittently or occasionally, depending on local land and environmental conditions. Some watercourses may only flow for short periods in some years.

Assessment of intermittently or occasionally flowing watercourses may require onsite inspection and desktop analysis from a suitably qualified water specialist, particularly in instances where the physical features of the watercourse may not be well defined. You can contact the department’s regional office for your area to discuss the circumstances on your property or for hydrological information to guide whether a watercourse may be present on your property.

Naturally rising water at the head of a watercourse

The term ‘head of the watercourse’ is not used in the Act. However, the department uses this term to describe the origin of a watercourse. In the spring context, the head of the watercourse is the point at which water naturally rises to the surface of the land.

The term ‘spring watercourse’ is not used in the Act. The department has used the term ‘spring watercourse’ in this guideline for ease of reference, to differentiate between that section of a watercourse which is fed solely by a spring and that section of a watercourse which is a watercourse due to being fed by other sources of water.

Not all watercourses have a spring at the head, with flow being provided from other catchment sources (surface runoff and/or subsurface flow) to generate the watercourse (Figure 1). However, all section 5(1)(a) springs will present in a catchment at the head of a watercourse or spring flow because these springs satisfy all elements of section 5(1)(a).

Multiple springs may exist within a catchment. Each small watercourse in a catchment will have its own head and may, or may not, have a spring present at that head. Refer to figures provided in the *Self-assessment* section of this field guide.

How to distinguish between spring water and other sources of water

If naturally rising water on the property is at the head of a watercourse, then a watercourse formed solely from that spring water (‘spring watercourse’) may not be a regulated watercourse until it leaves the boundaries of that property.

However, with increasing distance downstream, away from a section 5(1)(a) spring, the spring watercourse is likely to also be receiving flow from other catchment sources such as surface runoff (commonly occurring as sheet flow), subsurface flow and tributary flow, and increasing in flow volume. Other catchment flows can combine with the water in a spring watercourse, increasing the volume of flow with distance downstream.

If the spring water collects with other flows in circumstances where those other flows would, by themselves, be sufficient to form a watercourse, then the spring water has mixed with a regulated watercourse[4] (see consideration 4, in the *Self-assessment* section of this field guide).

Taking of spring generated flow, as close to the spring as possible, without interfering with the spring, will help ensure the take and any dam construction does not require a licence or permit by reason of section 5(1)(a).

Dams constructed on a watercourse further downstream, away from a spring, run the risk of interfering with a regulated watercourse (Figure 2).

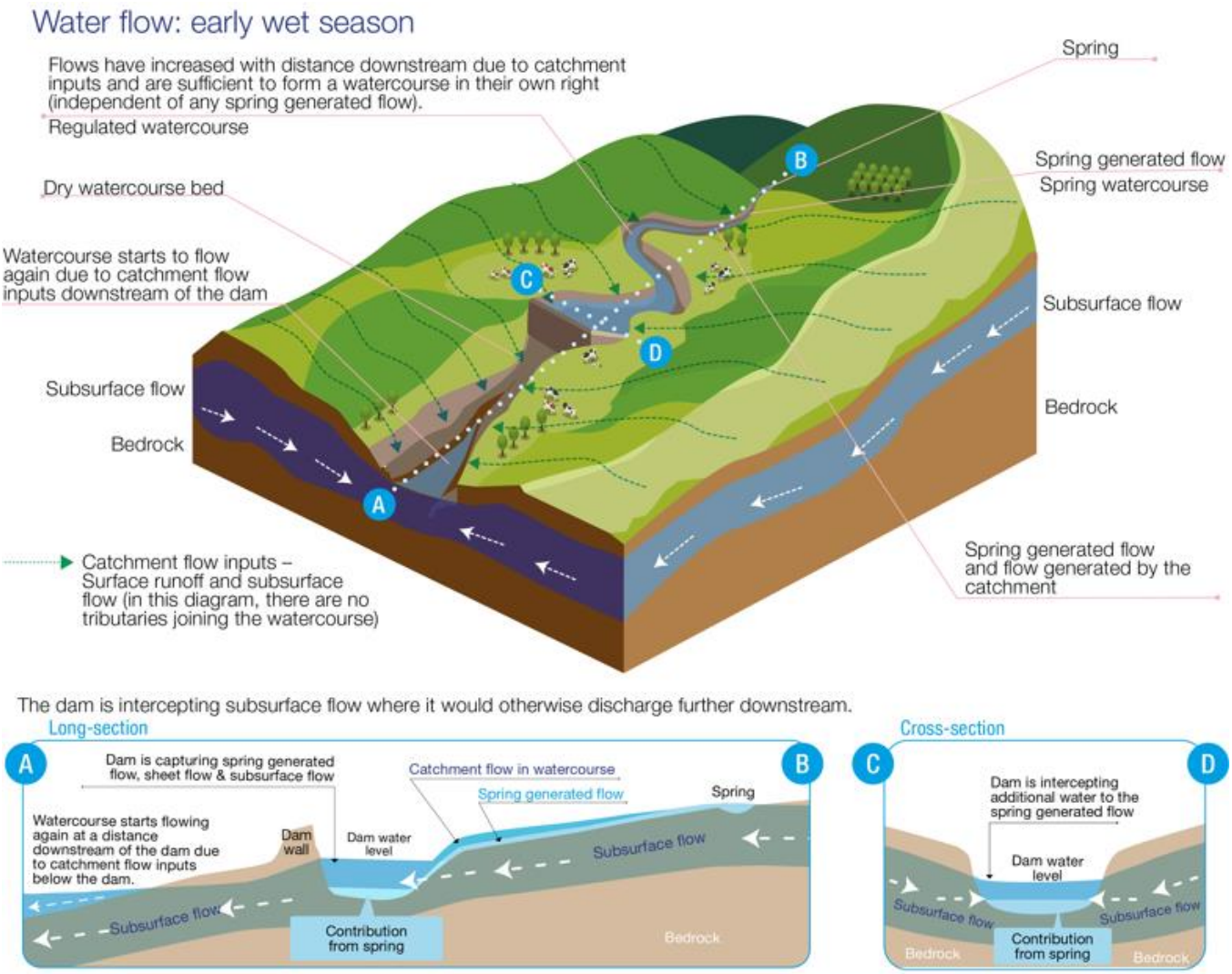

Figure 2 Diagram showing the catchment hydrology and flow dynamics that may occur on a property following the commencement of the wet season. The diagram shows how flow in a watercourse may change from the head of a watercourse to the downstream property boundary. In this scenario, underground water levels have risen in response to rainfall and the spring is discharging water. The flow volume from the spring does

[4] A regulated watercourse is a watercourse in a proclaimed area or a watercourse that is part of a system of watercourses that are specified in a proclamation made under section 6 of the Act.

not increase once it leaves the spring until it mixes with other water flows coming from the catchment. In this scenario the land is sufficiently wet and rainfall is reaching the watercourse via surface runoff (commonly occurring as 'sheet flow') and water flowing through saturated soil profiles below the land surface (subsurface flow). Both types of flow travel downslope, meet at the watercourse and then flow together in a downstream direction with the flow from the spring. The volume of flow in the watercourse continues to increase with distance downstream due to surface and subsurface flows coming in from opposing hillsides and accumulating with the upstream flow. In this scenario the dam is located away from the spring and has interfered with a regulated watercourse due to catchment flows upstream of the dam being sufficient to form a watercourse in their own right (not including the flow generated by the spring).

If a spring watercourse on that land is subsequently fed by other discharges of underground water into its bed or bed and banks, then those discharges are not exempt under section 5(1)(a) (see consideration 3, in the *Self-assessment* section of this field guide). The regulated watercourse downstream will contain some exempt water from the spring at the head of the watercourse.[5] If this were the case on your property, you would need a licence to take water from the regulated watercourse and a permit to interfere with the bed or bed and banks of that regulated watercourse. Where regulation applies, the department will specify the amount of water that may be taken under the licence. For the department to understand how much water is regulated water and how much water in the watercourse is exempt spring water, we would ask you to measure or estimate the amount of water produced by the spring at the head of the watercourse and describe how you measured or estimated that volume (see the *Measuring and estimating the volume of water produced by a spring* section in this field guide).

You can contact the department's regional office in your local area to request information to guide whether you have a section 5(1)(a) spring. Alternatively, you may need to hire a suitably qualified water specialist to conduct an onsite inspection and desktop analysis.

[5] See definition of 'spring' and 'watercourse' in sections 2 and 3 of the Act and in Appendix 1 of the Guidelines. These definitions operate so that a spring only occurs at the head of a watercourse or in cases where no watercourse forms from the spring.

Self-assessment

Determine whether a section 5(1)(a) exemption applies

The requirements under the Act need to be demonstrated for a spring exemption to apply to the taking of water. The considerations are:

1. The land where spring water naturally rises and flows must have been granted or demised by the Crown.
2. The water must naturally rise to, and flow over, the surface of land.
3. Underground water must not discharge directly into a watercourse, wetland, reservoir or other body of water.
4. The spring water has not mixed with water in an otherwise existing watercourse at the point it is to be taken.[6]
5. The spring must be wholly within the boundary of the land belonging to the landowner or occupier of land and the exemption applies only within the boundary of the land belonging to the landowner or occupier of land where the spring rises and flows.

If the spring satisfies all the above considerations, then it is a spring for the purpose of section 5(1)(a) and taking water will be exempt from Part III regulation.

You should use the self-assessment guide provided in this chapter to determine whether a spring for the purposes of section 5(1)(a) exists on your property.

Consideration 1 – Land is granted or demised by the Crown

Land is granted or demised by the Crown if it:

- has been granted in such a way that it is no longer Crown land (e.g. freehold land), or
- is Crown land that is subject to a Crown lease to a person who is not part of the Crown (e.g. pastoral lease or other leasehold interest).

The status of the land can be verified by a certificate of title or a lease agreement with the Crown.

Consideration 2 – Spring water must naturally rise and flow over the surface of the land

A spring must be ‘a spring of water naturally rising to and flowing over the surface of land’. The fact that it must be ‘a spring of water’ and must be ‘rising’ indicates that it refers to water rising to the surface under its own pressure and does not include percolation of water because of waterlogging. The water must also be flowing away from this location and does not include wetlands, soaks, reservoirs or any other body of standing water.

[6] This is not part of the definition of spring but is relevant to the point at which any spring water may be proposed to be taken. If at the point of taking, the spring water has mixed with regulated water, you may need a licence to take the regulated water and a permit to dam that regulated water.

Water should not be brought to the surface by artificial methods, meaning that water must not be pumped to the surface, abstracted from underground or accessed by excavating or disturbing the land to access underground water.

You should consider:

- where the naturally rising water occurs
- whether the water flows over the surface of the land away from the point it rises to the surface
- how to measure and estimate the volume of water flow, produced by the spring (e.g. litres per second/ or cubic metres per second). Refer to the *Measuring and estimating the volume of water produced by a spring* section of this field guide.

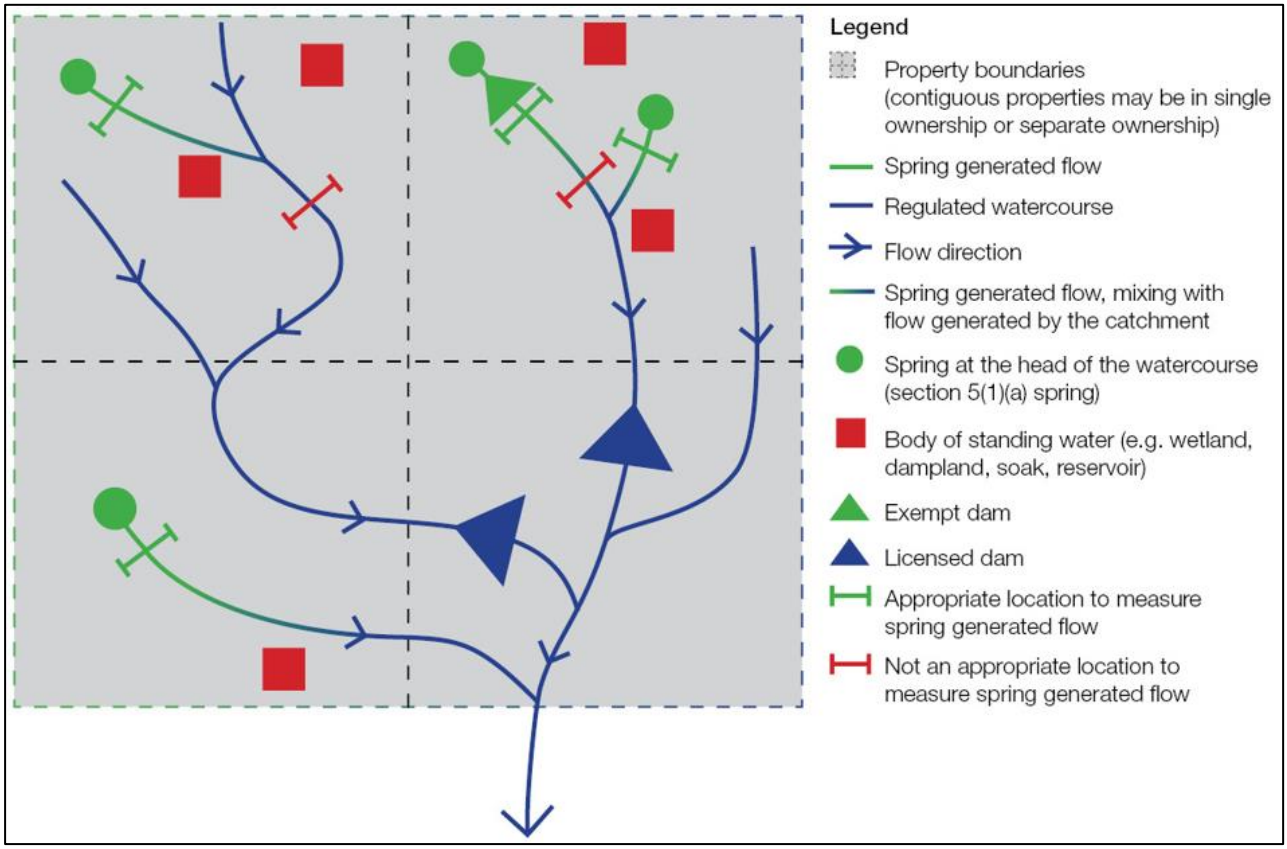

Figure 3 Section 5(1)(a) springs (green) are at the head of a watercourse and must flow away from the spring over the surface of the land. To ensure you are measuring the volume of flow generated by the spring, measurement locations should be as close is as feasibly possible to the spring. Where a dam already exists below a spring, measure the flow leaving the dam at the spillway or in the watercourse just downstream of the dam. This should be done during periods where there are no other catchment flow inputs (e.g. outside of the wet season).

Consideration 3 – Spring water must not discharge directly into a watercourse, wetland, reservoir or other body of water

You should be satisfied that the rising water does not discharge directly into a watercourse.[7]

Where a spring is located in the bed of a watercourse, it is not a section 5(1)(a) spring, as the spring water does not flow away over the surface of the land, but instead will be discharging directly into the watercourse.

All section 5(1)(a) springs will be present in the catchment at the head of a watercourse or spring flow. Refer to the *Naturally rising water at the head of a watercourse* section of this field guide.

It is important to identify the watercourses on your property and the sources of the water that contribute to the existence of those watercourses. You should consider the guidance provided in the *Guidance to help identify watercourses* section of this field guide to help you identify whether a watercourse may be present and whether a discharge of underground water is into the bed of a watercourse. You can contact the department's regional office for your area or a suitably qualified water specialist if you are unsure whether a spring on your property is a section 5(1)(a) spring.

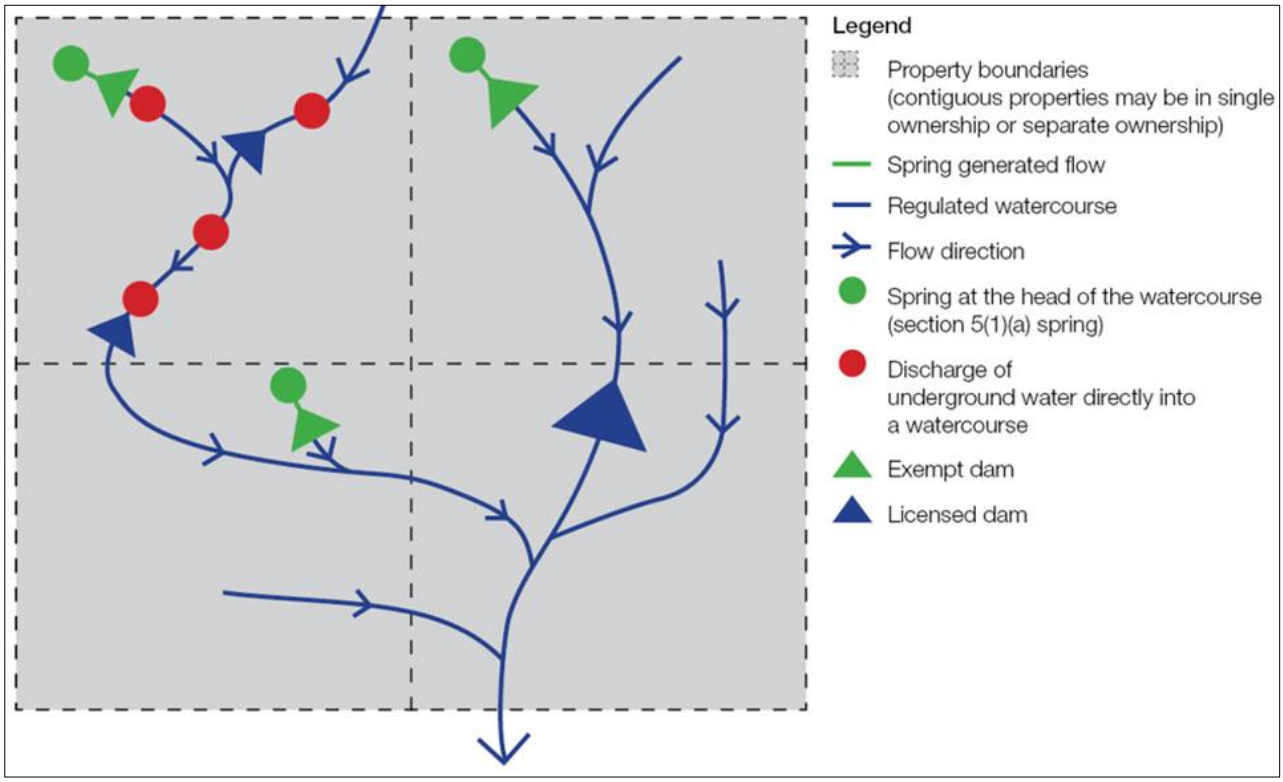

Figure 4 Any discharge of underground water directly into the bed of a watercourse is not a section 5(1)(a) spring.

[7] A spring, as defined under the Act, does not include the discharge of underground water directly into a watercourse, wetland, reservoir or other body of water.

Consideration 4 – Spring water has not mixed with water in an otherwise existing watercourse at the point that it is to be taken

With increasing distance downstream, away from a section 5(1)(a) spring, the spring watercourse is likely to also be receiving flow from other catchment sources such as surface runoff (commonly occurring as sheet flow), subsurface flow and tributary flow, and increasing in flow volume. Other catchment flows can combine with the water in a spring watercourse, increasing the volume of flow with distance downstream.

If the spring water collects with other flows, in circumstances where those other flows would, by themselves, be sufficient to form a watercourse, then the spring water has mixed with a regulated watercourse.[8]

If you want to take spring water from a point (or downstream from a point) where the spring water has mixed with a sufficiently formed watercourse in its own right, and you are in a proclaimed surface water area, you need a licence and, if you intend to interfere with that watercourse, a permit. You would need to measure or estimate the total amount of water taken from the spring and used on your property. Refer to the *Measuring and estimating the volume of water produced by a spring* section of this field guide.

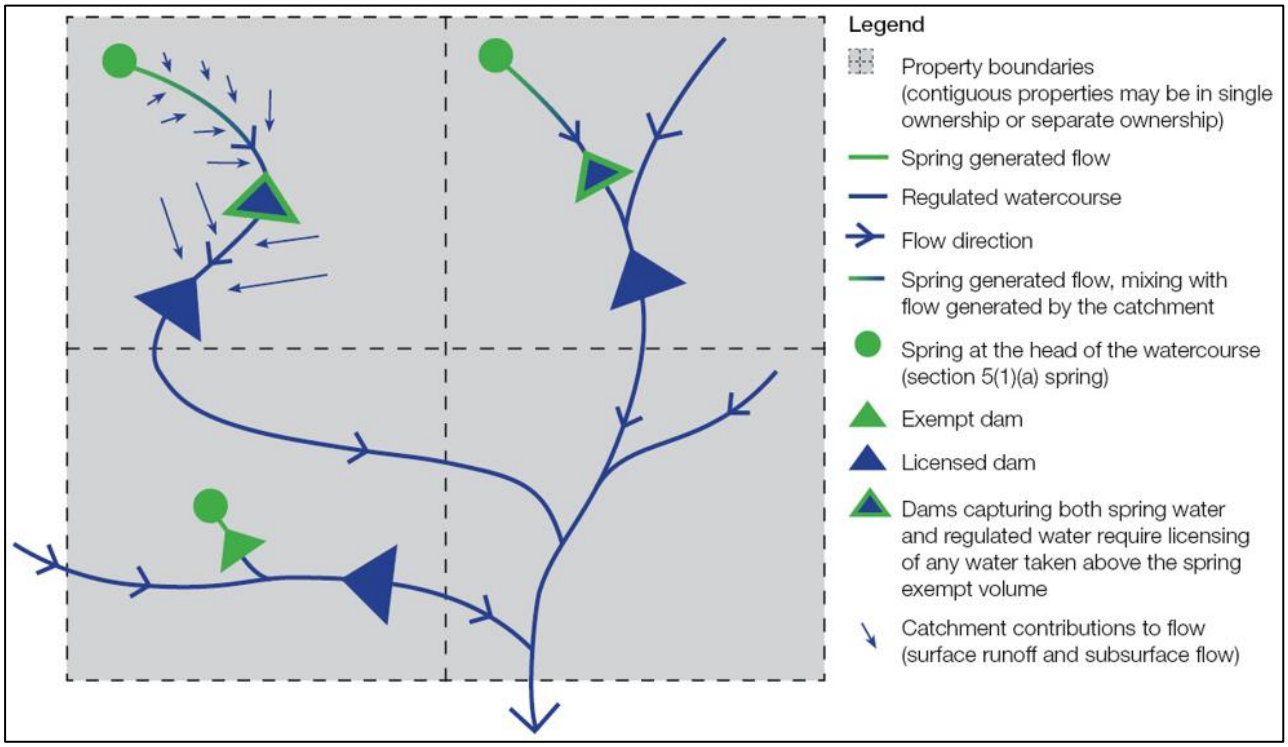

Figure 5 Dams that are positioned on a watercourse directly downstream of a spring are less likely to be interfering with a regulated watercourse and less likely to require licensing. Dams constructed on a watercourse further downstream, away from the spring, run the risk of interfering with a regulated watercourse. Where a dam has interfered with a regulated watercourse, the take of the volume of water produced by the spring would be exempt and the take of other water generated by the catchment, may need to be regulated.

[8] A regulated watercourse is a watercourse in a proclaimed area or a watercourse that is part of a system of watercourses that are specified in a proclamation made under section 6 of the Act.

Consideration 5 – The spring must be wholly within the boundary of the land belonging to the landowner or occupier of land and the exemption applies only within this boundary where the spring rises and flows

The exemption from regulation under section 5(1)(a) applies only within the boundary of the land that belongs to you; that is, where the spring rises and flows. The spring must be present wholly within your property.

If you have confirmed that a spring exists wholly within a property boundary, the water flow generated from the spring may be exempt from regulation (subject to considerations 1 to 4) until the flow crosses a property boundary. The exemption does not apply once the spring water flows beyond the boundary of your land.

When spring water has passed beyond the boundary of the land where it rises and flows, then the section 5(1)(a) exemption no longer applies and regulation under Part III of the Act is required.

You should consider:

- the location where a spring rises and flows on the property – see considerations 2 and 3
- the location of other watercourses relative to the spring and your proposed location to take water – see consideration 4
- where the property boundaries are in relation to that spring.

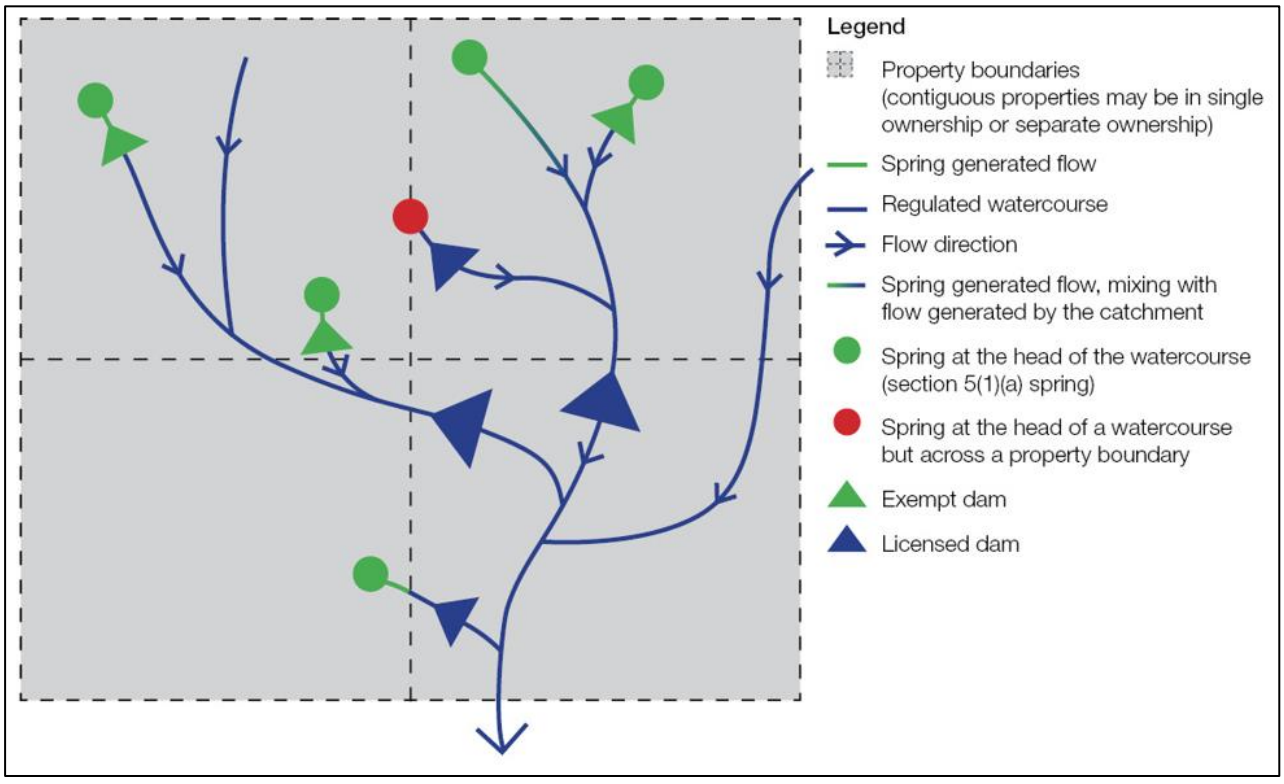

Figure 6 A spring that exists over a property boundary is not a section 5(1)(a) spring. The spring musty be wholly within a property boundary and the water flow generated by that spring must be taken within that property boundary to be exempt from regulation.

Self-assessment methods

You may undertake the following self-assessment methods:

- Onsite self-assessment and evidence gathering.
- Desktop assessment and evidence gathering.

In complex cases, you may wish to contact the department to discuss an assessment relative to your individual circumstances or obtain advice from a suitably qualified water specialist.

Onsite self-assessment and evidence gathering

The department recommends you gather onsite evidence and record as much information as possible on the self-assessment considerations. This can be in the form of photos, videos and written documents.

You should record the date of the onsite property survey, including climatic details (e.g. rainfall, season), to provide useful information on the factors that may influence the rise and flow of water in the area.

Springs may flow all year round or have intermittent flow, making it a difficult task to identify whether water is a spring or a standing body of water such as a wetland, soak or waterlogging. The department recommends you conduct onsite validation of springs in late summer to reduce the perceived impact of rainfall (waterlogging) and elevated groundwater tables (i.e. seasonal variation of the watertable).[9]

Desktop self-assessment and evidence gathering

You can undertake a desktop assessment to collect data for a specific property and see how it fits into the broader surface water catchment.

Your desktop assessment may consider information such as geospatial datasets from geographic information systems (GIS) available from government agencies (e.g. Landgate) or suitably qualified water specialists. If you engage a water specialist, you may have to pay for professional services and/or to obtain information and reports.

You can use a desktop assessment to determine the presence of a watercourse upstream of a potential spring by using geospatial datasets (e.g. hydrography, aerial photography, topography, geology).

The department may also be able to provide information that will assist you in your self-assessment as outlined in Chapter 4 of the *Guideline: Spring exemptions*.

Assessing complex cases

If your case is complex, you may need to seek technical validation from a suitably qualified water specialist for further investigation and review to determine the:

- natural rise and flow of spring water from underground water sources, and/or
- the presence of a watercourse and its interaction with uprising groundwater.

[9] A key difference between a section 5(1)(a) spring and standing water such as a wetland, soak or waterlogging, is that the water in a section(5)(1)(a) spring will flow away from the point at which the water reaches the surface.

The following tools may be used as part of the assessment:

- *Confirm flow paths and catchment boundaries* – this process uses elevation data and GIS software to derive the flow direction and catchment area of a watercourse.
- *Determine likelihood of runoff from the catchment* – this process determines the likelihood of sheet flow being generated in intense rainfall events where the rainfall rate exceeds the soil infiltration rate.
- *Confirm that runoff will be likely to reach the catchment outlet* – this process will estimate the time of flow concentration and help estimate the likelihood of flow reaching the catchment outlet, which may represent the intersection with another watercourse or existing or proposed dam.
- *Streamflow modelling* – this process scales measured streamflow[10] from the nearest stream-gauging station, where relevant and applicable.

These tools may be used in conjunction with on-site inspection and validation.

Compile information

Once you have completed your self-assessment and appropriately determined that the circumstances on your property meet the considerations of section 5(1)(a), the department recommends that you collate and retain all supporting evidence. This may include:

- maps identifying property boundaries, location and extent of water collection areas and water flow, topography or vegetation
- satellite imagery, photographs and videos
- hydrological reports from suitably qualified surface water experts addressing hydrological elements of the provision
- methodology and records of measurement to demonstrate volumetric estimations of flow and annual calculations
- any legal documents relating to land tenure or access.

You will need to pay all costs associated with the engagement of a suitably qualified water specialist to undertake any investigations and any written assessment reports.

[10] Streamflow is water that flows along a defined channel and bed and may flow permanently, intermittently or occasionally. Stream flow describes the flow of water in any watercourse and is part of the catchment's water balance.

Measuring and estimating the volume of water produced by a spring

To meet the requirements of section 5(1)(a) of the Act and be exempt from regulation, the department recommends that you only take the volume of water flow generated by a section 5(1)(a) spring.

Some springs produce flow year-round (perennial springs) while others may flow intermittently (intermittent springs).

Perennial springs

For perennial springs, you may wish to measure and estimate the flow volume from the spring once in the dry season. Measuring or estimating flow during the peak of the dry season helps ensure there are no other flow inputs from the catchment. In the south-west of the state, this is typically during February.

A one-off flow measurement in the dry season can be used to calculate the flow volume over a year and inform the size of dam construction or installation of infrastructure that will not take more than the spring exempt volume.

Alternatively, you can undertake a series of measurements spaced over a year, or continuous flow measurement, to inform any variability in the flow leaving a spring during the year. As a minimum, a flow measurement is needed during the peak of the dry season to show the volume generated by the spring.

Intermittent springs

For intermittent springs, you may wish to perform a series of flow measurements or continuous flow measurement. At a minimum, it is recommended a flow measurement is conducted as soon as practicable after the spring starts to flow, and the date of the measurement and the date the spring started to flow, are recorded. Other measurements spread out over the flow season can be conducted to inform how the flow coming from the spring changes over a year. The single flow measurement soon after the spring has started to flow or the series of flow measurements over the year, can be used to estimate the annual volume of water flowing from the spring, which is the volume of water you can take under the spring exemption. Alternatively, you may wish to perform a continuous flow measurement method over the year.

Flow measurement and estimation approaches

Before measuring and estimating any flow, you should ensure there has been no rainfall in the preceding week.

The method of measurement you choose to estimate the volume of flow leaving a spring will depend on your local land circumstances including:

- the size of the spring and the amount of water flow it generates
- the presence of a confined channel downstream of the spring
- the presence of an existing dam or dams downstream of the spring.

Two simple flow measurement methods you can use for springs with a small amount of flow are the volumetric ‘bucket method’ and the ‘float method’. Please note that these methods only

provide a representative flow at the time of measurement in context of the local circumstances in the above dot points.

You can contact the department's regional office in your local area to get advice on how best to measure the flow leaving a spring.

Bucket method

1. Find an area downstream of the spring where flow is confined to a narrow pathway.
2. Place a bucket or container of known volume below the spring and record the time in seconds it takes to fill the container (the container should not be narrower than the width of the flow path). Repeat this step a minimum of three times to provide an average.
3. Divide the volume (in litres) by the time (in seconds) taken to fill the bucket or container to give you the flow rate in litres per second (L/s).
4. Multiply this number by 0.0864 to give you the average flow rate in megalitres per day (ML/day).
5. Multiply this number by the number of days the spring flows in a year to obtain an estimate of the annual volume of water produced by the spring in megalitres (ML). This is suitable where a measurement has occurred soon after the spring has started to flow (ideally within the first week of the spring generating flow) or during the peak of the dry season.
6. Where several flow measurements have occurred for different periods during the year to capture variability in spring generated flow, multiply each ML/day flow rate by the estimated number of days the spring flows at that rate in a year. Add these volumes together to obtain an estimate of the annual volume of water produced by the spring in megalitres (ML).

Float method

1. For springs with a relatively straight and shallow flow path below of the spring, mark out a specific length and record the time (in seconds) it takes for a floating object (e.g. an orange) to travel that distance.
2. Record the length, width and depth of the section being measured (in metres). Multiply these three numbers to get the volume of water in cubic metres (m^3).
3. Divide this volume by the time (in seconds) taken for the floating object to travel the marked length to give you a flow rate in metres cubed per second (m^3/s).
4. Multiply this flow rate by 86.4 to give you a flow rate in megalitres per day (ML/day).
5. Multiply the flow rate (ML/day) by the number of days the spring flows in a year to obtain an estimate of the annual volume of water produced by the spring in megalitres (ML). This is suitable where a measurement has occurred soon after the spring has started to flow (ideally within the first week of the spring generating flow) or during the peak of the dry season.
7. Where several flow measurements have occurred for different periods during the year to capture variability in spring generated flow, multiply each ML/day flow rate by the estimated number of days the spring flows for that period. Add these volumes together to obtain an estimate of the annual volume of water produced by the spring in megalitres (ML).

Other methods

For springs with a large volume of flow or site-specific conditions not suited to the bucket or float method, you can conduct flow measurement using standardised hydrometric measurement equipment.

This can range from the use of a flow meter (point velocity measurement), to flow gauging across a channel cross-section (area velocity method), to installation of a v-notch weir (gauging station, continuous flow measurement) and should be done in line with the Bureau of Meteorology's *National Industry Guidelines for hydrometric monitoring*.

You may wish to engage a suitably qualified water specialist if you are considering undertaking this method of measurement.

You can also contact the department's regional office in your local area to discuss potential flow measurement options.

Contact information

If you have any queries or require additional information, please contact the department's local regional office (based on your property's location).

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