PUATEA001B and CPPSIS3001A

Mapping Assistant

LEARNER GUIDE

(DRAFT VERSION 3)

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Acknowledgements

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EMSINA consists of representatives from state and territory state GIS User Groups and three federal Government agencies:

ACT Emergency Services Agency
Australian Federal Police
Australian Maritime Safety Authority
Bureau of Meteorology
Country Fire Authority (Vic)
Country Fire Service (SA)
Department of Agriculture, Fisheries and Forestry
Department of Defence, Defence Imagery and Geospatial Organisation
Department of Environment and Conservation (WA)
Department of Primary Industries, Parks, Water & Environment
Department of Sustainability and Environment (Vic)
Emergency Management Australia
Emergency Services Telecommunications Authority
Fire and Emergency Services Authority (WA)
Geoscience Australia
NSW Police
NSW Rural Fire Service
NSW State Emergency Service
QLD Fire and Rescue Service
QLD Police
Tasmania Fire Service

Learning context

This Learner Guide is part of the Mapping Assistant Training Resource Kit (TRK) intended to train members of Australasian fire and emergency service agencies in the knowledge and skills required to perform the role of Mapping Assistant in the Australasian Inter-service Incident Management System (AIIMS) during an emergency response.

The TRK for Mapping Assistant comprises the following parts:

- Facilitator Guide;
- Learner Guide; and
- Assessment Guide.

The Mapping Assistant TRK can only be implemented by a Registered Training Organisation (RTO) in accordance with the requirements of the Australian Quality Training Framework standards for RTOs.

The training has been designed to meet the needs of the Australasian fire and emergency services and is intended to be delivered within the context of emergency management.

This Learner Guide covers only the underpinning knowledge for Mapping Team Member training and needs to be supported through supervised instruction and practice using the agency's Geographic Information System and related technology.

At the completion of this training, you (the learner) should be able to:

- Work under direct supervision as a Mapping Team Assistant during an emergency response, and
- Interpret and create simple digital maps using basic cartographic skills within organisational guidelines.

The principles and concepts covered in this training are aligned to the following units of competency.

PUA00 Public Safety Training Package - Industry Wide Competency Standards

- PUATEA001B Work in a team

CPP07 Property Services Training Package - Spatial Information Services Units of Competency

- CPPSIS3001A Apply map presentation principles

A series of self-assessment questions are provided at the end of each section to assist you to monitor your progress and to support your learning process.

Section

1

The Mapping Team in AIIMS

Section 1

The Mapping Team in AIIMS

This topic covers the role, purpose and structure of the Mapping Team in the Australasian Inter-service Incident Management System (AIIMS) during an emergency response.

AIIMS overview

AIIMS is a management framework used by emergency management agencies to assist with the effective and efficient control of an incident. AIIMS can be used either by a single organisation, or by two or more organisations working together.

AIIMS is scalable in that it can be applied across a whole range of incidents from small to large and provides the basis for an expanded response as an incident grows in size or complexity.

AIIMS has been adopted by all Australian fire and land management agencies, the Australian Council of State Emergency Services and the National Biosecurity Committee.

The principles of AIIMS

AIIMS is based on three key principles:

- Functional management;
- Management by objectives; and
- Span of control.

Functional management

In the context of AIIMS, functional management means the use of specific functions to manage an incident. AIIMS uses the following five functions:

- Incident Control – the overall management of all activities necessary for the resolution of the incident;
- Operations – the management and supervision of operational resources and activities;
- Planning – planning to control the incident and keeping a record of the incident situation and resources;

- Public Information – the dissemination of information to the public and other stakeholders, including warnings and alerts; and
- Logistics - provision and maintenance of resources, facilities, services and materials.

The people appointed to be responsible for the functions of Control, Planning, Operations, Public Information and Logistics are the Incident Management Team (IMT). The functions are denoted by the colours white (Control), yellow (Planning), red (Operations), brown (Public information) and blue (Logistics).

The IMT operates from the Incident Control Centre (ICC).

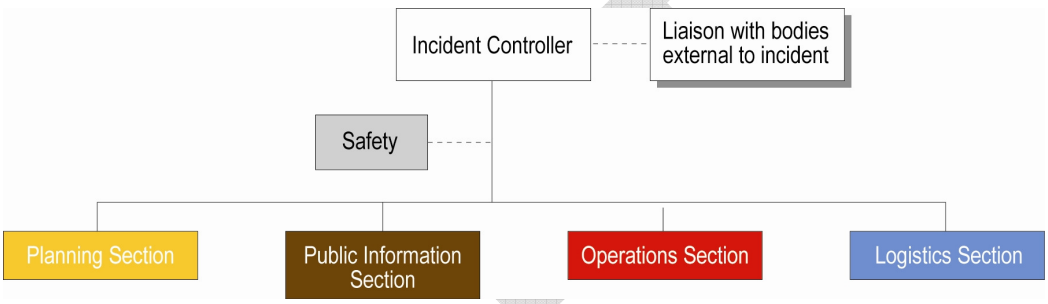


Figure 1 – The Incident Management Team

Management by objectives

Management by objectives is a process where the Incident Controller, in consultation with the Incident Management Team, determines the desired outcomes (or objectives) of the incident response effort.

The incident objectives are communicated through the Incident Action Plan (IAP). The IAP is the overall plan for resolving the incident. At any point in time, each incident can have only one set of objectives and one IAP. This is to ensure that all incident personnel are working towards the one set of objectives.

Span of Control

Span of control is a concept that relates to the number of groups or individuals able to be effectively supervised by one person.

The span of control for an incident response should be 5 to 7 reporting groups or individuals to each supervisor. This maintains the supervisor's ability to effectively task, monitor and evaluate the performance of subordinates.

The incident management structure

The Incident Controller determines the incident management structure according to the size and complexity of the incident. At a small incident, or during the early phases of a potentially large or complex incident, the Incident Controller may effectively manage all the functions. As the incident develops in size or complexity, the Incident Controller may allocate responsibility for managing these functions to other people.

The incident management structure might eventually expand to have separate people and teams managing the delivery of each of the planning, operations, public information and

logistics functions. The structure of the planning, public information, operations and logistics sections are shown in the following diagram.

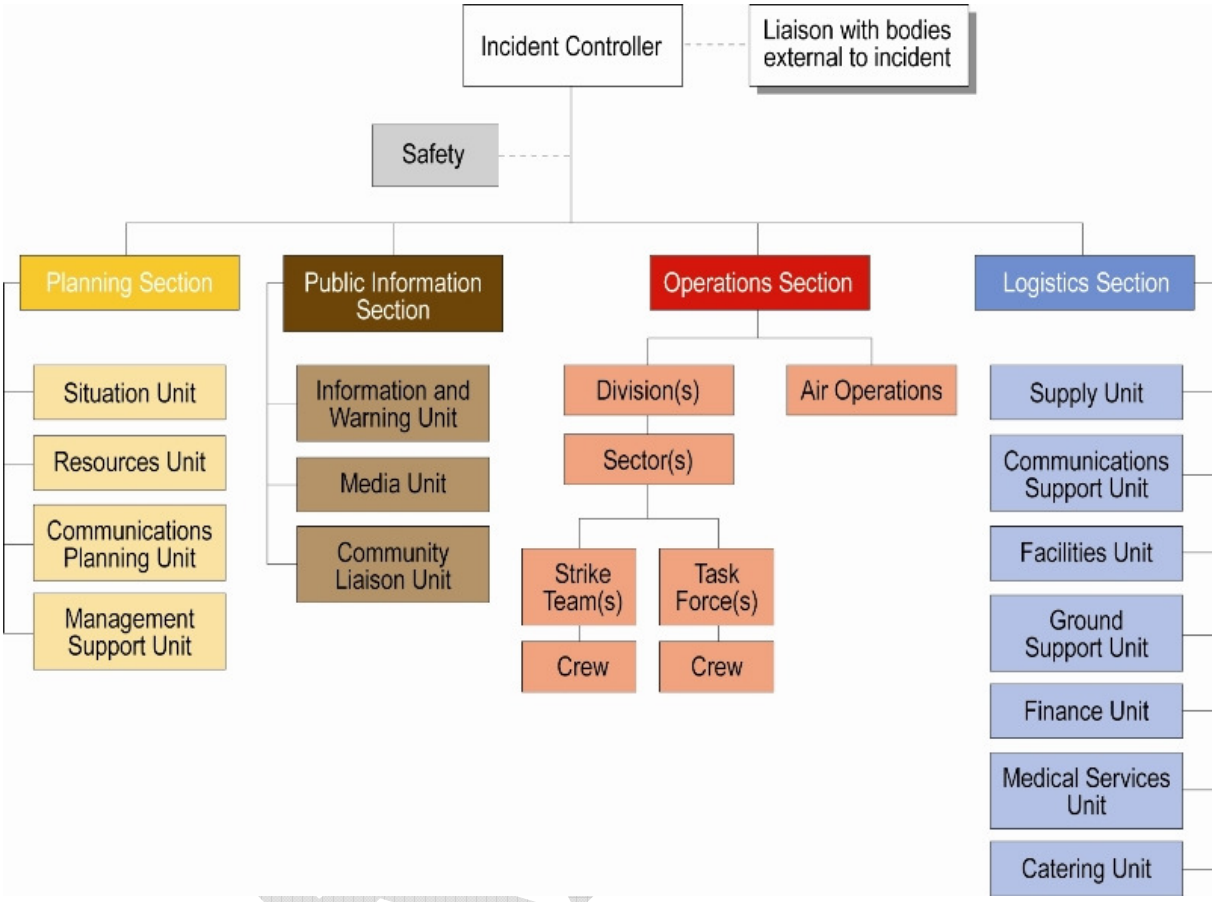


Figure 2 – The AIIMS structure

Note how the Operations Section is divided into divisions and sectors. Divisions are only used in large or complex incidents.

The Planning Section

The planning function provides support for control of the incident through:

- Collection and evaluation of information on the current and forecast situation
- Preparation and dissemination of the Incident Action Plan (IAP)
- Collection and maintenance of the information about resources allocated to the incident.

The incident Controller may allocate responsibility for the planning function to a Planning Officer.

The complexity of an incident may require the Planning Section to be divided into units and specialist resources dedicated to particular tasks or functions such as:

- Situation Unit - monitors and predicts the incident's behaviour and prepares alternative strategies;

- Resources Unit – gathers, maintains and presents information on incident resources;
- Communications Planning Unit – prepares the Communications Plan (e.g. the radio channel, phone number for each part of the AIIMS structure); and
- Management Support Unit – provides administrative services and operates communications equipment within the Incident Control Centre.

Technical specialists may also provide advice in their particular area of expertise.

The Situation Unit

The Situation Unit is engaged in the collection, processing and organising of situation information. The Unit summarises this information, develops projections and forecasts of possible future events and prepares maps and intelligence information for use at the incident. The Unit also prepares a range of alternative strategies and identifies their associated risks and likely outcomes.

The components of the Situation Unit are:

- Incident prediction/options Analysis;
- Mapping;
- Collecting, processing and organising situation information; and
- Weather services.

The mapping function

Mapping information, with relevant supporting documentation, is an important tool for summarising and describing the incident situation. Maps are used to record and communicate intelligence, strategies and tactics, for briefings and are also a valuable record of the incident activities.

The mapping function could be performed by a single officer or a by a Mapping Team.

Depending upon requirements, the tasks performed by the mapping function may include:

- Production of maps for the Incident Action Plan and for operational briefings;
- Production of public information maps;
- Production of maps to help the Planning Section, Situation Unit (e.g. current and projected incident situation) and other units; and
- Creation of incident data from GPS, field observation, imagery and other sources.

The Mapping Team

During a large incident the Mapping Team comprises:

- The Mapping Team Leader;
- Mapping Team Members; and
- Mapping Team Assistants.

Mapping Team Leader

The Mapping Team Leader:

- Works within the Situation Unit to identify the required products the Mapping Team is required to produce;
- Establishes team goals and identifies the tasks required to achieve team goals;
- Establishes and allocates team member tasks; and
- Manages team performance in order to deliver products to the required standard and timeframe.

Mapping Team Member

The Mapping Team Member:

- Works under limited supervision as a member of the Mapping Team;
- Supervises Mapping Team Assistants as required;
- Collects basic spatial data (e.g. downloads a GPS device);
- Interprets image data information;
- Applies geographic information systems (GIS) software in order to produce the required mapping products.

Mapping Team Assistant

The Mapping Team Assistant:

- Works under the direct supervision of a Mapping Team Member; and
- Interprets and creates simple digital maps using basic cartographic skills.

Deployment to an incident

On deployment to an incident, the Mapping Team will usually be advised of type of incident they are being sent to (e.g. fire or flood etc.).

On arrival at the Incident Control Centre, the Situation Unit Leader or the Mapping Team Leader should brief the Mapping Team.

The briefing should include the types and specification of maps that are required and their intended recipients e.g. incident management personnel, Departmental Heads, Ministers, the community etc., and the priority and timing of their production.

Information flow for the Mapping Team

The Mapping Team Leader reports to and receives the objectives for the shift from the Situation Unit Leader. This is to ensure the Mapping Team activities contribute to the overall objectives of the Planning Section and Situation Unit.

Sometimes requests are directed to the Mapping Team from other people mid-shift. Where these requests conflict with current agreed team objectives, the Mapping Team should refer these requests to the Situation Unit Leader who may need to review the Mapping Team objectives.

Workspace requirement

The Mapping Team needs to be located:

- Where there is access to the agency's corporate GIS reference data e.g. topographic data;

- Where there is a reliable power source and backup power source;
- With computers with:
  - access to the agency's electronic filing system;
  - the agency's GIS software package loaded;
  - maximum power/memory to be able to cope with the demands of map production;
  - big screens for ease of map production;
- Close to the Situation Unit, to whom the Mapping Team reports and will need to interact regularly; and
- Close to printers and plotters; and
- Close to all other Mapping Team members.

The information technology demands of the Mapping Team suggest that the Mapping Team should be located in a pre-designated fixed location Incident Control Centre.

However, sometimes this is not possible with Mapping Team members deployed to mobile locations with laptop computers. In these circumstances, Mapping Team members should ascertain their needs will be met prior to arrival.

Summary

- AIIMS is based on three key principles:
  - Functional management;
  - Management by objectives; and
  - Span of control.
- The Incident Controller is appointed by the Control Agency and manages all activities related to the incident.
- The Incident Controller is supported by the Planning Officer, the Operations Officer, the Public Information Officer and the Logistics Officer. The people performing these functions are the Incident Management Team or IMT.
- The planning function provides support for control of the incident through:
  - Collection and evaluation of information on the current and forecast situation;
  - Preparation and dissemination of the Incident Action Plan (IAP); and
  - Collection and maintenance of the information about resources that are allocated to the incident.
- The Situation Unit is engaged in the collection of situation information and the development of incident control options.
- The Mapping Team is a component of the Situation Unit. The Mapping Team is responsible for producing mapping information, with relevant supporting documentation in order to summarise and describe the incident situation.
- During a large incident the Mapping Team comprises:
  - The Mapping Team Leader – who is responsible for obtaining work instructions and managing the Mapping Team to ensure that the products are delivered.
  - Mapping Team Members – who work independently to collect and interpret incident and image data, and then apply GIS software to produce mapping products.

  - Mapping Team Assistants – who work under supervision and produce basic mapping products.
- Requests for Mapping Team work should come through the Situation Unit Leader.

Self assessment questions

1. Identify the composition of the Incident Management Team or IMT.
2. Which role is responsible for the production of the Incident Action Plan?
3. Explain the role of the Situation Unit.
4. Explain the role of the Mapping Team.
5. Identify each of the key roles in the Mapping Team and their function.
6. How does the Mapping Team normally receive requests for mapping products?

Section

2

Working in the Mapping Team

Section 2

Working in the Mapping Team

This topic covers the underpinning knowledge regarding working in a team environment, such as when working as a member of the Mapping Team during emergencies.

Team work

A workgroup develops into a 'team' when the common purpose of the team is understood by all team members and each member plays their assigned role to the best of their ability to achieve this purpose.

People in a team depend on each other and share their skills and experience to achieve outcomes that they could not achieve as individuals. The combined capability of the team is the key benefit for both individual team members and the organisation.

The best performing teams have an on-going commitment to becoming even better. These teams work in a collaborative climate characterised by openness, trust and shared respect. Members are willing to listen and approach problem-solving as a challenge to be overcome. There is a collective 'buzz' and acceptance of team responsibility for success or failure. Team members feel able to express their views and ideas freely and openly and have high expectations and standards of excellence.

High performance teams

The characteristics which typically apply to teams which are successful are:

Size	The size and membership of the team must be appropriate to the task and enable the group to work together comfortably as a unit.
Supportive leadership	A supportive leader who has high personal performance standards.
Challenge	A goal that requires the collective effort and multiple skills of the team.
Shared values	Team objectives and values are understood and accepted by all team members. Team member behaviour is governed by shared team values and attitudes.
Results focus	A focus on results and commitment to objectives and measurable targets for

	achieving these results.
Team and individual accountability	Acceptance of both, team and individual accountability for performance.
Right mix of skills	Team members with the right mix of skills required to complete the task.
Role clarity	Clear roles and responsibilities for team members and team structures and procedures which are linked to team objectives and resources.
Sufficient resources	Resources available for completing team tasks efficiently.
Autonomy	The team has the authority to decide how they will work and how resources will be allocated.
Open communication	There is open communication and information sharing between team members. Issues, difficulties and obstacles to performance are confronted and dealt with openly.
Teambuilding	Efforts are made to develop and maintain a team climate.
Respect	Team members treat each other with respect and trust; support and value each other; and relate well to others outside the team.
Recognition	Formal or informal processes are in place for recognition and reward of individual contributions as well as team successes.
Decision-making	Procedures are in place for effective decision-making focused on team objectives.
Team learning	• Processes are in place to assist teamwork, including grievance procedures, conflict resolution and performance feedback. • Time is taken to reflect on progress and learn from outcomes of team activity and team operations and targets are regularly reviewed. • Individual and team development needs are met.

Activities

1. Consider the most effective work group you have been involved with and identify the main factors which made this group effective.
2. Consider the least effective work group you have been involved with and identify the main factors which caused this group to be ineffective.
3. Would you define either of the groups you have described above as a team? Explain why or why not.

Team 'players'

People contribute to teams in different ways because of their different skills, personalities and preferred ways of working. These differences are essential in a team but they can cause

conflict. It is important that you accept and work with these differences to maximise the potential of each team member and benefit the team overall.

Each person in a team must be valued for their contribution to the attainment of team goals. Some personalities are attracted to 'big picture' roles while others are attracted to roles emphasising 'detail'. Both types of roles are equally important.

No personality type is better or worse than another and each behavioural style contributes differently to the team. This is very desirable as a team comprised entirely of people operating and behaving in the same way will lack the variety of skills usually needed in a high performing team.

Each team member has a responsibility towards the task, the team and the individual.

Key responsibilities of team members are to:

- Communicate with team leaders and other members;
- Co-operate with team leaders and other members;
- Contribute skills and experience towards achieving team tasks; and
- Share the work, and assist and support other members.

Good team players are capable people who know how to fit in with others to bring the team success. Team players:

- Share good ideas;
- Find ways to help people in their team;
- Recognise good results; and
- Ask for help when they need it to get a job done.

Individual differences

A summary of the preferred ways of working you can typically expect to see in a team are summarised below. Knowing and understanding these individual preferences will help you to value individual diversity in a team.

TRAITS	People with these traits:
Vision	• look for creative, new ways to achieve goals • can often see the bigger picture of the task • bring new ideas to the team • like solving new problems • are flexible in their approach and attitudes.
Detail	• are organised and realistic • like an established way of doing things • are patient with routine details and are good at precise work • will complete tasks set • are down to earth in their approach.
Task oriented	• focus on achieving objectives • are relatively unemotional and uninterested in feelings

TRAITS	People with these traits:
	• like to get things settled and concluded • plan work and follow the plan • are results focused.
People oriented	• maintain team spirit and enhance the general well being of others • make sure everyone has a say • value harmony and not allow decisions to be influenced by their own or other people's likes/dislikes.

Receiving instructions

During the management of emergencies there is usually no time available for work to be repeated or for team members to take extra time to complete tasks. Tasks usually have to be completed on time and to a quality standard.

This means each team member must be clear about the work to be done and the required outcomes. Each team member is responsible for checking they understand exactly what is required and must be able to answer the following questions:

- What will the outcome/product look like? What quality criteria must be met?
- Are there standards with which the product /outcome must comply?
- What techniques/processes/procedures should be used to produce the desired outcome?
- Are there other people who should be involved in the work?
- What are the planned start and end dates/times?
- Are there any constraints to be observed, e.g. people to be involved, rules to be followed?
- How often should progress be reported, and in what form?
- Who is the contact person for problems?
- How will the quality of the product be checked?
- Does the work need to be checked at a number of points along the way? Who will be doing the checking?
- Who should be informed when the work is finished?
- Where is the finished product stored?

Giving and receiving feedback

Receiving and providing feedback on performance plays an integral role in developing honesty and trust within teams. Positive feedback motivates the team and constructive feedback can refocus an individual or team and ensure that there is no bad feeling.

As a team member, you may find that you receive or provide feedback on:

- The progress of work;
- The behaviour of team members and its impact on the work of the team; and

- Ideas generated in the team or by individual team members.

Receiving feedback

Team members should be aware of how their behaviour appears to others. A person's self image may be different from the image others see. Being aware of these differences enables a person to act appropriately in teamwork situations. Team members should be prepared to receive feedback when this is viewed as helping the performance of the individual and the team.

The effectiveness of giving and receiving feedback relies on having open discussion about issues raised and on reaching agreement about actions to be taken in the light of feedback given. When receiving feedback from a team leader or team member, you should:

- Keep an open mind and suspend judgment;
- Listen and repeat or paraphrase what you have heard and confirm that you understand what is being said; and
- Focus upon behaviours and facts rather than any emotions or subjective opinions being expressed.

Giving feedback

Providing appropriate feedback may include: acknowledging initiative, aptitude, ideas, performance and providing constructive criticism. Techniques for providing feedback in a useful and productive way are summarised below.

Focus on specific behaviours

Feedback should be specific rather than general. Avoid vague statements such as '*You have a poor attitude'* or '*I'm impressed with the job you did'*. These statements don't give enough information. You need to explain why you are being critical or complimentary.

Keep it impersonal

Any feedback and negative feedback in particular, should be descriptive rather than judgmental or evaluative. No matter how upset you are, keep the feedback job-related and never criticise someone personally because of an inappropriate action.

Focus on objectives

If you have to say something negative, make sure it is directed toward the task objectives. If you are merely 'venting' your feelings, such feedback undermines your credibility and lessens the impact and influence of future feedback. An example of venting rather than providing useful feedback is:

'The team just isn't pulling together, the work is still coming in and we aren't getting anything done. Something's got to give'.

Time it well

Feedback is most meaningful when it is timely. Unnecessary delay in providing feedback lessens the likelihood that the feedback will be effective in bringing about desired behaviour change. However, if you have insufficient information, if you are angry or if you are otherwise emotionally upset, it is wise to delay giving feedback until you are better prepared. Feedback should be given with appropriate regard to protecting the confidentiality and privacy of individuals and you should never criticise someone in public.

Ensure understanding

Feedback should be specific so that the person to whom it is directed, clearly and fully understands the issue. They should verify and describe their understanding of the information received.

Make feedback useful	There is little value in reminding a person of a shortcoming over which he or she has no control. Indicate specifically what can be done to improve the situation. This offers guidance to people who understand the problem but don't know how to resolve it.
Tailor the feedback to fit the person	Consider past performance and potential when you are deciding on the frequency, amount and content of performance feedback required.

Reporting

Regular reporting to the team and the team leader on the progress of work is an essential part of being an effective team member. Regular reporting is important because it provides feedback on how the plan of work is progressing.

The work plan will be altered according to progress, including whether or not timeframes are being met. Resource issues that are emerging can also be addressed.

Reporting to the team provides additional opportunity for the involvement of all members. Team members may have useful experience in the task which they can share, other pertinent information or have a different way of looking at the problem.

Reporting is also a forum for seeking assistance if required. The team can provide assistance and share responsibility. It is important to note that only functioning teams are emotionally able to do this. If there is no trust or tolerance in the group, assistance and feedback may not be accepted.

Points to be considered when reporting to the team leader and/or team include:

- Progress made towards achieving the work objectives;
- Identification of information that may affect the work of another team member;
- Future resource requirements;
- Future timeframes and timelines; and
- Any predicted problems in completing work and subsequently the team objective.

Reporting should be succinct and relevant. Ultimately the team and the team leader are only interested in results and issues which may have implications for the team's work overall.

Policies and procedures

Team members must always work within the bounds set by the policies and procedures of the agency.

Policies and procedures ensure that the agency complies with its legal obligations in areas such as equal employment opportunity (EEO), anti-discrimination and occupational health and safety.

Policies and procedures reflect an agency's's intention to treat employees fairly, taking into account their individual needs. Policies and procedures also contribute to effective teamwork by setting out procedures, performance standards and the agency's quality standards.

They cover workplace matters such as:

- Legislation relevant to the agency or the emergency being managed;
- Recruitment and selection;

- Induction;
- Occupational health and safety;
- Employment conditions, equal opportunity, anti-discrimination and cultural diversity;
- Termination of employment;
- Operational procedures;
- Operational performance standards; and
- Training and development.

Sometimes, during emergency work, issues arise that appear to breach the agency's policy or procedures. These should be referred to the supervisor who should know the appropriate agency process to follow in such circumstances.

Workplace health and safety

Employee responsibilities

In New Zealand and Australia there are laws and regulations which set out mandatory minimum requirements for workplace health and safety. These are designed to protect employees and to provide a safe environment to work.

In New Zealand there is the Health and Safety in Employment Act 1992 which is governed by Occupational Safety and Health Services.

In Australia each state and territory has its own legislation which is enforced by their respective authorities:

- NSW Workcover Authority;
- Victorian Workcover Authority;
- Worksafe Western Australia;
- South Australian Workcover Authority;
- Queensland Division of Workplace Health and Safety;
- Workplace Standards Tasmania;
- Northern Territory Work Health Authority; and
- ACT Workcover.

Legislation provides for joint participant of employers and employees in ensuring safe working conditions.

Office hazards

A whole range of possible heath and safety hazards are present in the office environment. A hazard is anything with the potential to cause harm. You should do the following if there is a hazard:

- Say NO to working in unsafe conditions;
- Report unsafe or hazardous conditions to your supervisor straight away;
- Warn others at risk about the danger – where it is and how it happened; and
- Always ask yourself before starting a new job – can I get hurt doing this job? It you answer YES or MAYBE, talk to your supervisor right away.

Office hazards can include:

- Inappropriate furniture;
- Inadequate or incorrect lighting;
- Poor temperature and humidity control;
- Noise factors;
- Electrical hazards; and
- Chemical hazards.

Ergonomic computer workstation set-up comprises a 'neutral position' as follows:

- Gaze down slightly;
- Neck slightly bent;
- Shoulders relaxed;
- Elbows 90 degrees or greater;
- Wrists straight;
- Fingers gently curved;
- Hips at 90 degrees or greater; and
- Feet flat on the floor.

If you are regularly using a laptop computer the screen should be raised to the correct height, as detailed above, and a standard keyboard utilized in place of the laptop keyboard.

Risk factors when computing are:

- Sitting in a non-neutral posture;
- Sitting for long periods of time without moving large muscle groups;
- Overuse of the small muscles of the hand through repetitive movement;
- Using more force than necessary to input; and
- Contact stress, wrists 'planted' on the edge of the keyboard or desk.

Fire hazards are present at all worksites. You must acquaint yourself with the Fire Safety drill appropriate to your workplace immediately on commencement at that site.

Chemical hazards in an office include the toners associated with laser printers and photocopiers. These toners can cause serious irritations and inflammation of the lungs and mucous membranes. Tips to avoid this are:

- Avoid inhalation and physical contact with toners;
- Wear rubber gloves to add toner to copiers or printers - wash your hands and face when you have finished;
- Keep the area around the copier or printer well ventilated and install an extractor fan if necessary; and
- Ensure these chemicals are labelled and stored according to directions.

If you are TIRED or STRESSED you are more likely to have an accident. To prevent this:

- Adequate rest periods and breaks should be taken during the day;
- Boring and repetitive tasks may lead to carelessness - vary your tasks;
- Ask the team leader to introduce job rotation if possible; and

- Poor health can lead to an increase in accidents and a decline in productivity. Address health problems as early as possible before the problem becomes worse.

Fatigue

Incident management is generally considered to be a fatigue-inducing activity. Incident management may require working at any time of the day or night, working under demanding time pressures and working in poor environmental conditions. The key consequences of fatigue can include:

- Increased errors;
- Decreased attention span;
- Impaired perception and awareness;
- Impaired thinking and problem solving;
- Decreased motivation;
- Irritability; and
- Restlessness.

Your agency should have a policy regarding working and resting arrangements during emergencies to prevent the consequences of fatigue.

Injuries and prevention

If you are injured:

- Inform your on-site supervisor. You will need to complete an accident report form. Do NOT leave the site before notifying your supervisor – leaving the site without notification may result in the rejection of a Compensation Claim.
- Seek medical assistance if required. Within an IMT, First Aid is obtained through the Medical Services officer in the Logistics Section or other designated First Aider. If you need to attend a doctor, he/she must give you a medical certificate which will state what your injury is and whether you need time off work.

The main causes of office-based injuries and their prevention strategies are:

- Manual handling – if the load if too heavy for you, get help right away; and
- Office overuse injuries – perform office exercises regularly.

Summary

- A team is a small number of people with complementary skills who are committed to a common purpose and an approach for which they hold themselves mutually accountable.
- A workgroup develops into a 'team' when the common purpose of the team is understood by all team members and each member plays their assigned role to the best of their ability to achieve this purpose.
- Team players:
  - Share good ideas;
  - Find ways to help people in their team;
  - Recognise good results; and
  - Ask for help when they need it to get a job done.

- Team members must be prepared to request and accept assistance from other team members.
- Key responsibilities of team members are to:
  - Communicate with team leaders and other members;
  - Co-operate with team leaders and other members;
  - Contribute skills and experience towards achieving team tasks; and
  - Share in the work and assist and support other members.
- Each team member must be clear about the work to be done, the required outcomes and is responsible for checking they understand exactly what is required.
- The effectiveness of giving and receiving feedback relies on open discussion of issues raised and on reaching agreement about actions to be taken.
- When receiving feedback from a team leader or colleague you should:
  - Keep an open mind and suspend judgment;
  - Listen and repeat or paraphrase what you have heard thereby confirming you understand what is being said; and
  - Focus upon the behaviours and facts rather than any emotions or subjective opinions being expressed.
- When providing feedback:
  - Focus on specific behaviours;
  - Keep it impersonal;
  - Focus on objectives;
  - Time it well;
  - Ensure understanding;
  - Make feedback useful; and
  - Tailor the feedback to fit the person.
- Points to be considered when reporting to the team leader and/or team include:
  - Progress made towards achieving the work objectives;
  - Identification of information that may affect the work of another team member.
  - Future resource requirements;
  - Future timeframes and timelines; and
  - Any predicted problems in completing work and subsequently the team objective.
- Team members must always work within the bounds set by the policies and procedures of the agency. These ensure the agency complies with its legal obligations in areas such as equal employment opportunity, anti-discrimination and workplace health and safety.
- You should do the following if there is a hazard:
  - Say NO to working in unsafe conditions;
  - Report unsafe or hazardous conditions to your supervisor straight away;
  - Warn others at risk about the danger – where it is and how it happened;

- Always ask yourself before starting a new job – can I get hurt doing this job? If you answer YES or MAYBE, talk to your supervisor right away.

Self assessment questions

1. What characteristics define a well-performing team?
2. What makes a good 'team player'?
3. Identify the key responsibilities of team members.
4. What are some of the things you should keep in mind when receiving feedback?
5. What are some of the things you should keep in mind when giving feedback?
6. Identify some of the points that should be covered when reporting progress to the team leader.
7. Why is it important to work within the agency's policy and procedure framework?
8. What should you do if you notice a hazard in your workplace?

Section

3

Spatial reference systems

Section 3

Spatial reference systems

This unit explains spatial reference systems. This information is underpinning knowledge for the remainder of the Mapping Assistant training.

Further information can be obtained through the Fundamentals of Mapping http://www.icsm.gov.au/mapping/index.html and Geodetic Datums http://www.ga.gov.au/earth-monitoring/geodesy/geodetic-datums.html

Geo-referencing

All the elements on a map have a specific geographic location on or near the earth's surface.

'Geo-referencing' is accurately describing a geographic location. This is a critical skill for both mapping and GIS.

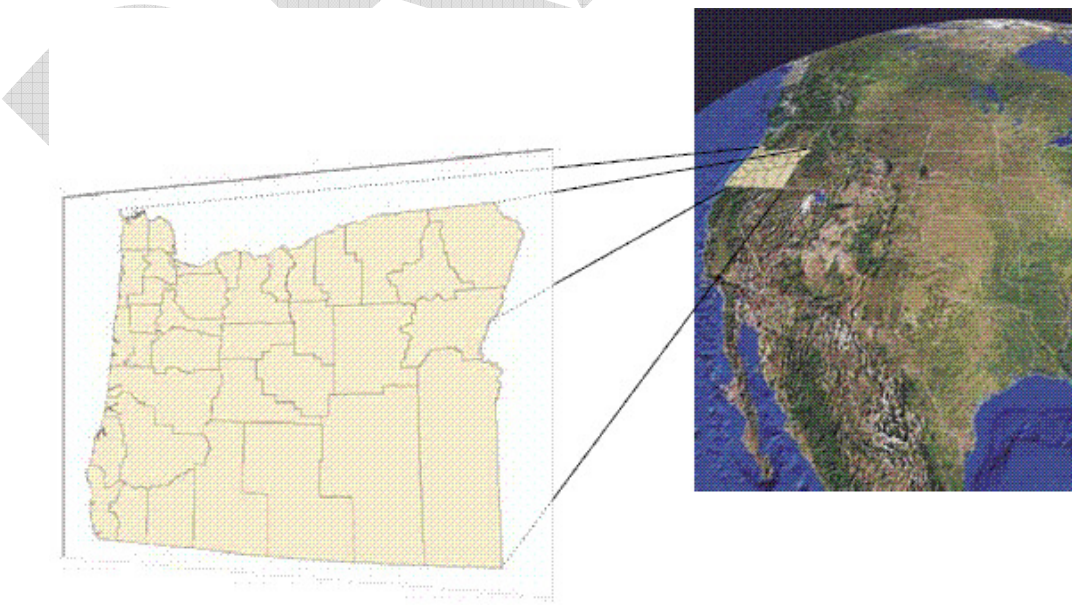


Figure 3 – Geo-referencing (ESRI)

Datum

Datum is a set of reference points on the earth's surface against which position measurements are made.

Horizontal datum is used to describe a point on the earth's surface. Vertical datum is used to measure elevations or depths.

The Geocentric Datum of Australia, 1994 (GDA94) has been adopted for use throughout Australia. GDA94 datum replaces the AGD66 and AGD84 datum throughout Australia.

A datum often has an associated model of the shape of the earth to define a coordinate system.

Coordinate systems

There are two main types of coordinate systems:

- Geographic coordinates (for example, latitude and longitude – usually expressed in degrees or decimals); and
- Projected coordinates (for example, a grid that represents the earth on a flat surface such as a page - usually expressed in metres).

The projected coordinate systems associated with GDA94 are:

- Map Grid of Australia 1994 (MGA94) is the standard projection for large scale maps; and
- Lambert (VG94) or Albers is the standard projection for small scale maps.

World Geodetic System 1984 (WGS84) is a worldwide reference system used by GPS. It is very similar to GDA94 (but not the same). This explains why GPS data may need to be converted to GDA94 prior to being able to be used in a GIS.

Data from different sources may need to be converted to the one datum and coordinate system in order for it to be merged within a GIS.

Geographic coordinate systems - latitude and longitude

One example of a geographic coordinate system is latitude and longitude.

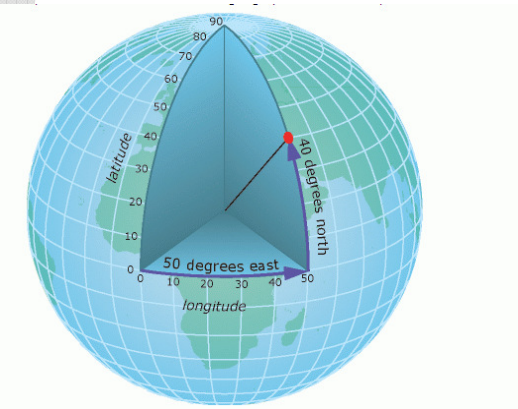


Figure 4 Latitude and longitude (ESRI)

Latitude angles are measured in a north-south direction. The equator is at an angle of 0°. The northern hemisphere has positive measures of latitude and the southern hemisphere has negative measures of latitude.

Longitude measures angles in an east-west direction. Longitude measures are traditionally based on the Prime Meridian, which is an imaginary line running from the North Pole through Greenwich, England to the South Pole. This angle is Longitude 0°. West of the Prime Meridian has negative Longitude and east has positive Longitude.

The closer you get to the Poles (i.e. the larger the latitude value), the distance between meridians gets closer and closer. This means that one degree of longitude actually represents a smaller distance the closer to the Poles you are. For example, at the latitude of Darwin (about 12°S), one degree of longitude is about 106km, but at Hobart (about 43°S), one degree of longitude is only 79km.

To precisely locate points on the earth's surface, degrees longitude and latitude have been divided into minutes (') and seconds ("). There are 60 minutes in each degree. For example, Canberra is approximately -35° 18' Latitude, 149° 08' Longitude.

Projected coordinate systems

Since the earth is spherical, a challenge is how to represent the real world using a flat or planar coordinate system. The process of flattening the earth is called projection, hence the term map projection.

Projected coordinate systems are any coordinate systems designed for a flat surface, such as a printed map or a computer screen. There is an infinite number of possible map projections.

All map projections representing the earth's surface as a flat map create distortions in some aspect of distance, area, shape or direction. Users cope with these limitations by using map projections that fit their intended uses, geographic location and extent.

GIS software can transform between coordinate systems.

Scale

Map scale is the mathematical relationship between the size of the map and the size of the piece of earth it is describing.

All maps have a scale, which may be simple (for single scale maps) or complex (for multi-scale maps). Modern maps have the advantage of using advanced earth measuring techniques and map projections, which results in more accurate mapping, with a reliably consistent scale applied across the face of the map.

This is based on a 'flat earth concept' – i.e. that there are no hills or valleys. As such it is a horizontal scale which makes no allowance for slope.

Methods of expressing scale

Representative fraction (RF)

This method expresses the distance on the map as a fraction of the corresponding distance on the ground. If the scale is 1:100,000, every distance on the map is 1/100,000 of the distance on the ground, e.g. 1 cm on the map represents 100,000 cm (or 1 km) on the ground.

Common scales for topographic maps are 1:250,000, 1:100,000, 1:50,000 and 1:25,000. A large-scale map shows more detail than a small scale map. A 1:25 000 map is a larger scale map than a 1:100,000 map, because 1/25,000 is a larger fraction than 1/100 000.

Linear scale (or scale bar)

A linear scale is drawn to assist in the measurement of distance, and on modern maps shows distances in kilometres and metres. Scale bars are created with logical units of measure e.g. 0.5 km, 1km, 2km, 5km, 10km etc to provide a product which is logical to use to measure distance.

Effect of scale

As the scale of a map changes from a smaller number to a larger number (e.g. from 1:100 to 1:100,000) the area of the Earth's surface which can be shown increases, but the amount of detail which can be shown decreases.

Smaller scale maps have less detail and cover a bigger area. Larger scale maps have more detail and cover less area.

There is no hard-and-fast rule as to which scales are described as small, medium or large – it all depends on your point of view.

The scale of a map, together with the size of the page, determines how much information can be shown on it. When selecting a map scale for an emergency response situation, the two main points to consider are the:

- Amount of detail required to support response activities;
- Size of the area involved in an incident; and
- Available page size.

Topographic mapping series are designed to be used at a specific scale for legibility e.g. 1:50,000. It is important that the Mapping Team use topographic maps at the relevant designed scales.

Figures 5 and 6 show an example of how the amount of detail changes with the changing scale.

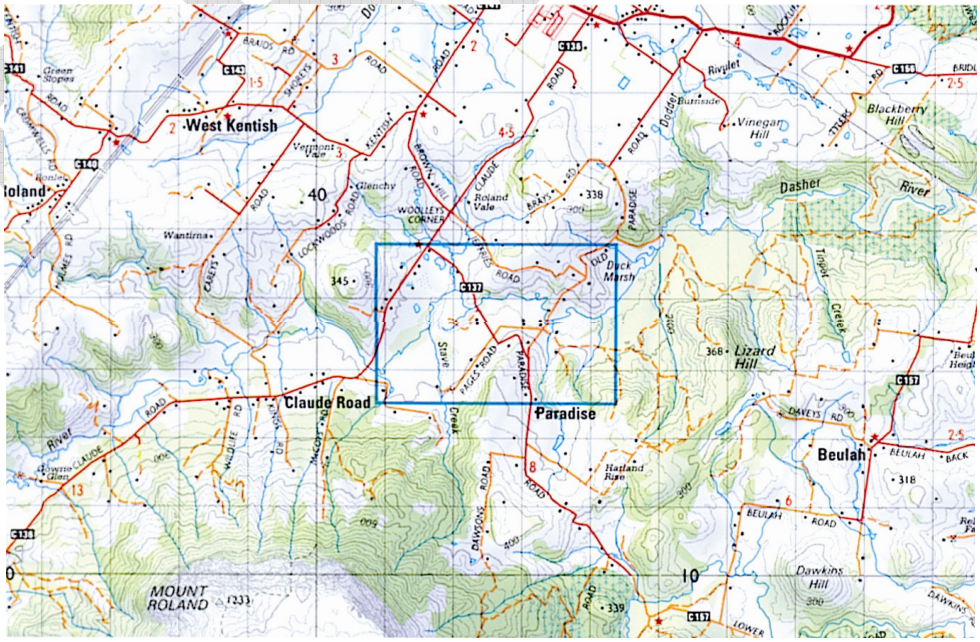


Figure 5: Effect of scale at 1:100 000

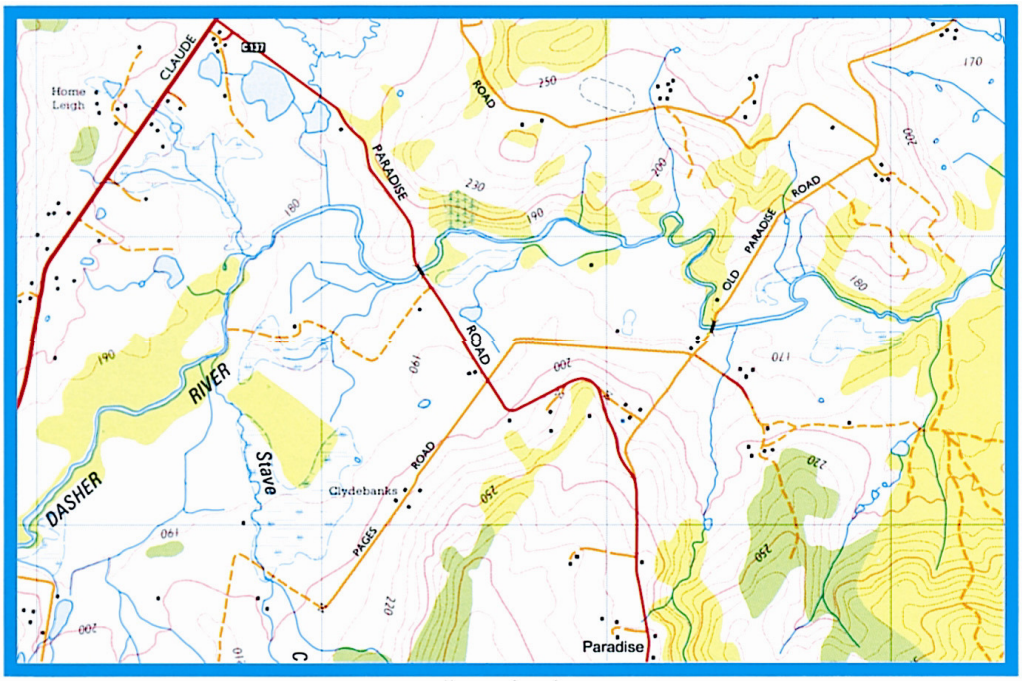


Figure 6: Effects of scale at 1:25 000

Use of a scale bar or linear scale is the easiest way to measure ground distance.

Summary

- Datum is a set of reference points on the earth's surface against which position measurements are made.
- Horizontal datum is used to describe a point on the earth's surface. Vertical datum is used to measure elevations or depths
- The Geocentric Datum of Australia, 1994 (GDA94) has been adopted for use throughout Australia. GDA94 datum replaces the AGD66 and AGD84 datum throughout Australia.
- A datum often has an associated model of the shape of the earth to define a coordinate system.
- There are two main types of coordinate systems:
  - Geographic coordinates(for example, latitude and longitude – usually expressed in degrees or decimals)
  - Projected coordinates (for example, a grid that represents the earth on a flat surface such as a page - usually expressed in metres).
- The projected coordinate systems associated with GDA94 are:
  - Map Grid of Australia 1994 (MGA94), which is the standard for large scale maps; and
  - Lambert (VG94) or Albers, which is the standard for small scale maps.

- World Geodetic System 1984 (WGS84) is a worldwide reference system used by GPS. It is very similar to GDA94 (but not the same). This explains why GPS data may need to be converted to GDA94 prior to being able to be used in a GIS.
- Data from different sources may need to be converted to the one datum and projection system in order for it to be merged within a GIS.

Self assessment questions

1. What is a datum?
2. Identify the two main types of coordinate system.
3. Which datum and map projection has been accepted Australia-wide?
4. Which datum is used by GPS?
5. Why do you often need to convert data from one datum and projection to another in a GIS?

Section

4

Symbology

Section 4

Symbology

This topic covers the nationally agreed symbols for maps used in emergency management.

Symbology is defined in geographic information systems (GIS) as the set of conventions, rules, or encoding systems defining how geographic information is represented on a map.

Thematic symbols

Within Australia, there is a standard set of map symbols used for emergency management.

Many emergency events, especially large scale incidents, cross jurisdictional and geographic boundaries. By using standard map symbols, personnel from different agencies and jurisdictions can use the same maps without the need for additional training.

This Australasian All Hazards Symbology project was sponsored by the Intergovernmental Committee on Surveying and Mapping (ICSM) and the Australia New Zealand Land Information Council (ANZLIC), and supported by Emergency Management Spatial Information Network Australia (EMSINA). The primary aim of the project was to develop a consistent set of All Hazards Symbology and have it adopted by emergency management agencies across Australia and New Zealand.

In 2010, a standard set of symbols was developed for use by the emergency management and first responder communities at all levels of need (i.e. national, state, local and incident).

Figure 7: Symbology framework

The Generic symbols are shown on the following pages.

Your agency can provide you with the symbology related to their specific hazard type.

Note that the symbols are likely to change over time with new symbols and changes to existing ones.

Please refer to the full listing which is on the AFAC web site http://www.afac.com.au.

Summary

- The use of standard symbols in emergency service maps improves interoperability between agencies and increases efficiency and safety.
- In 2010, a standard set of symbols was developed for use by the emergency management and first responder communities at all levels of need (i.e. national, state, local and incident).

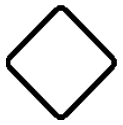
Self assessment questions

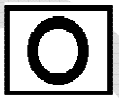
1. What are the benefits of the use of standard symbology?

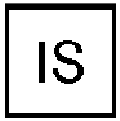
General Emergency Management Symbols

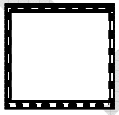
Note : Existing symbol font is ICS Fire Symbols 1.1 24 point unless otherwise stated, Always use Bold and Halo

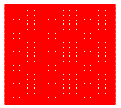
◇ Incident □ Operations ○ Asset

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.1	General Incident	General	Point		**Unconfirmed**	Any unplanned event requiring emergency intervention (AIIMS).	Label with Location; Name; DTG; Use at Event/Incident to Jurisdictional levels eg. aircraft crash.
					**Confirmed**		
1.2	Air Incident	General	Point			Occurrences during the operation of an aircraft in which any person involved suffers death or serious injury or in which the aircraft receives substantial damage (EMA).	
1.3	Landslide	General	Point			A landslide is the movement of rock, debris or earth down a slope. They result from the failure of the materials which make up the hill slope and are driven by the force of gravity. Landslides are known also as landslips, slumps or slope failure (Geoscience Australia)	
1.4	Marine Incident	General	Point			Occurrences during the operation of a boat or ship in which any person involved suffers death or serious injury or in which the boat or ship receives substantial damage (modification of EMA Air Incident definition).	
1.5	Rail Incident	General	Point			Occurrences during the operation of a train in which any person involved suffers death or serious injury or in which the train receives substantial damage (modification of EMA Air Incident definition).	
1.7	Storm Surge	General	Point			The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide) (WMO).	
ID	**Symbol (feature)**	**Theme**	**Geometry**	**System Symbol**	**Status**	**Definition (Source)**	**Guidelines and Examples**

1.7	Storm Surge	General	Point			The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide) (WMO).	
1.8	Thunderstorm	General	Point			Sudden electrical discharges manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder) (WMO). Often accompanied by squalls and/or precipitation (Rain and/or Hail)" (BoM Weather Service Handbook 1992).	
1.9	Tropical Cyclone	General	Point			Tropical cyclones are intense low pressure systems which form over warm ocean waters at low latitudes. Tropical cyclones are associated with strong winds, torrential rain and storm surges (in coastal areas) (BoM).	
1.10	Tsunami	General	Point			A tsunami is a series of ocean waves with very long wavelengths (typically hundreds of kilometres) caused by large-scale disturbances of the ocean (BoM).	
1.11	Vehicle Incident	General	Point			Occurrences during the operation of a wheeled or tracked vehicle in which any person involved suffers death or serious injury or in which the vehicle receives substantial damage (modification of EMA Air Incident definition).	
1.12	General Assets	General	Point			Anything valued by people which includes houses, crops, forests and, in many cases, the environment (AFAC).	
					Potentially Defendable	The status of the asset is defined by the judged ability to counter the known threat of an active incident.	
					Defendable		
					Not Defendable		

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.13	HAZMAT	General	Point			Storage location of substances or materials which has been determined by an appropriate authority to be capable of posing an unreasonable risk to health, safety and property.	
1.14	Historic Site	General	Point			Site of historical significance that emergency responders need to be aware of to minimise impact.	
1.15	Indigenous Site	General	Point			Site of Indigenous artifacts or cultural importance that emergency responders need to be aware of to minimise impact.	
1.16	Significant Flora	General	Point			Site of significant flora that emergency responders need to be aware of to minimise impact.	
1.17	Significant Fauna	General	Point			Site of significant fauna that emergency responders need to be aware of to minimise impact.	
1.18	Threatened Asset	General	Point			Asset identified at risk of being destroyed or significantly damaged by a hazard.	
1.19	Access point	General	Point			Undefined	
1.20	Airbase	General	Point	 Or 		Undefined	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.21	Animal Shelter	General	Point			Undefined	
1.22	Area of Interest	General	Polygon			The extent and location anticipated at being at risk from a particular incident or event. Syn: Area of Concern	Generic AIIMS - Acknowledge issues with wildfire burnt area. Mandatory labelling required if conflict exists.
1.23	Assembly Area	General	Point			A designated location used for the assembly of emergency-affected persons. The area may also incorporate an emergency relief centre (EMA).	
1.24	Base Camp	General	Point			A location where personnel are accommodated and fed for a period of time. A base camp usually contains catering, ablution and accommodation facilities, a water supply and a lighting system, and may include other facilities such as car parking maintenance and servicing (AIIMS).	
1.25	Control Area	General	Polygon			A declared area in which defined movement conditions apply .	Generic AIIMS - Acknowledge issues with wildfire burnt area. Mandatory labelling required if conflict exists.
1.26	Control Centre	General	Point			The location where the Incident Controller and various members of the Incident Management Team provide overall direction of response activities (AFAC).	
1.27	Control/ Operations Point	General	Point			The location from which the overall field operations are commanded by the Operations Officer (AIIMS).	
1.28	Declaration Area	General	Polygon			Undefined	
1.29	Divisional Boundary	General	Point			Division: A portion of the incident comprising of two or more sectors. The number of sectors grouped in a Division should be such as to ensure effective direction and control of operations. Divisions are generally identified by a local geographic name (AFAC).	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.30	Divisional Command	General	Point			Location at an incident from which the Division Commander of that division operates (AIIMS).	
1.31	Drop Zone	General	Point			Target area for airtankers, helitankers, or cargo dropping (AFAC).	
1.32	Emergency Alert Warning Area	General	Polygon			Undefined	Generic AIIMS - propose solid fill as with National Standard. Transparency as required.
1.33	Evacuation/ Escape Route	General	Line			A planned route away from danger areas at a hazard (AFAC modified).	
1.34			Point		Established		
					Planned		
					Established		
					Planned		

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.36	Evacuation Centre	General	Point		Established	Centres that provide affected people with basic human needs including accommodation, food and water (EMA).	
					Planned		
1.37	Helibase	General	Point	 OR 		A location for parking, refuelling and maintenance of helicopters operating in support of an incident (AFAC).	
1.38	Helipad	General	Point			A designated location which meets specific requirements for a helicopter to take off and land.	
1.39	Location - Fire Appliance	General	Point			The location of any motor vehicles that carry firefighters and equipment (TBC).	
1.40	Location - Ambulance	General	Point			Undefined	
1.41	Location - Police vehicle	General	Point			Undefined	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples
1.42	Location -SES vehicle	General	Point			Undefined	
21.43	Medical	General	Point			Undefined	
1.44	Mobile Weather Station		Point			Often referred to as Portable Automatic Weather Stations (BoM).	
1.45	Refuge Area	General	Point			Areas where people may seek shelter from the danger of fire (modified EMA).	
1.46	Road Closure Traffic Control Point	General	Point		Active	Road check point or barricade to maintain compliance with movement control restrictions (AEM_Glossary).	
					Planned		
1.47	Sector Boundary	General	Line			Sector: A specific area of an incident which is under the control of a Sector Commander who is supervising a number of crews (AFAC).	
1.48	Sector Command	General	Point			Undefined	
1.49	Staging Area	General	Point			A prearranged, strategically placed area where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency (EMA).	

Section

5

Mapping products

Section 5

Mapping products

This section identifies the range of mapping products routinely used in emergency management.

There are unlimited maps that could be requested, but standard maps can be produced more quickly and easily than customised maps and most agencies have standard map products they use for their specific types of incident.

Sometimes people will request a special map. Customised products can be made but the requesting person must be made aware that these will take longer to produce. Additionally, their production may hinder the production of other maps.

Where there are a lot of maps being requested, the Mapping Team leader will need to clarify priorities for map production with the Situation Unit Leader,

ALL maps should be checked and approved by the Situation Unit Leader before release.

Planning maps

Planning maps include:

- Incident Overview Map;
- Situation Map; and
- Strategic Map.

Incident Overview Map

Incident Control Centres usually display an Incident Overview Map (sometimes called Operations Map or Operations Overview Map) on a wall. This map shows the whole incident on the one map and updates can be added – making the map a 'running' record of incident development.

When the Operations Officer and Division and Sector Commanders return from the incident they usually update this map. Updates from all other sources can also be added as they become available. Traditionally these updates were hard copy but increasingly digital technology is being used – with the information being transferred directly into the GIS.

This map could be used for

- The Planning Officer and IMT to develop strategy and tactics;

- General reference by all IMT staff;
- Briefings;
- Operations personnel (who would use a smaller version of the same map in the IAP – see Incident Action Plan maps below).

An example of this type of map follows:

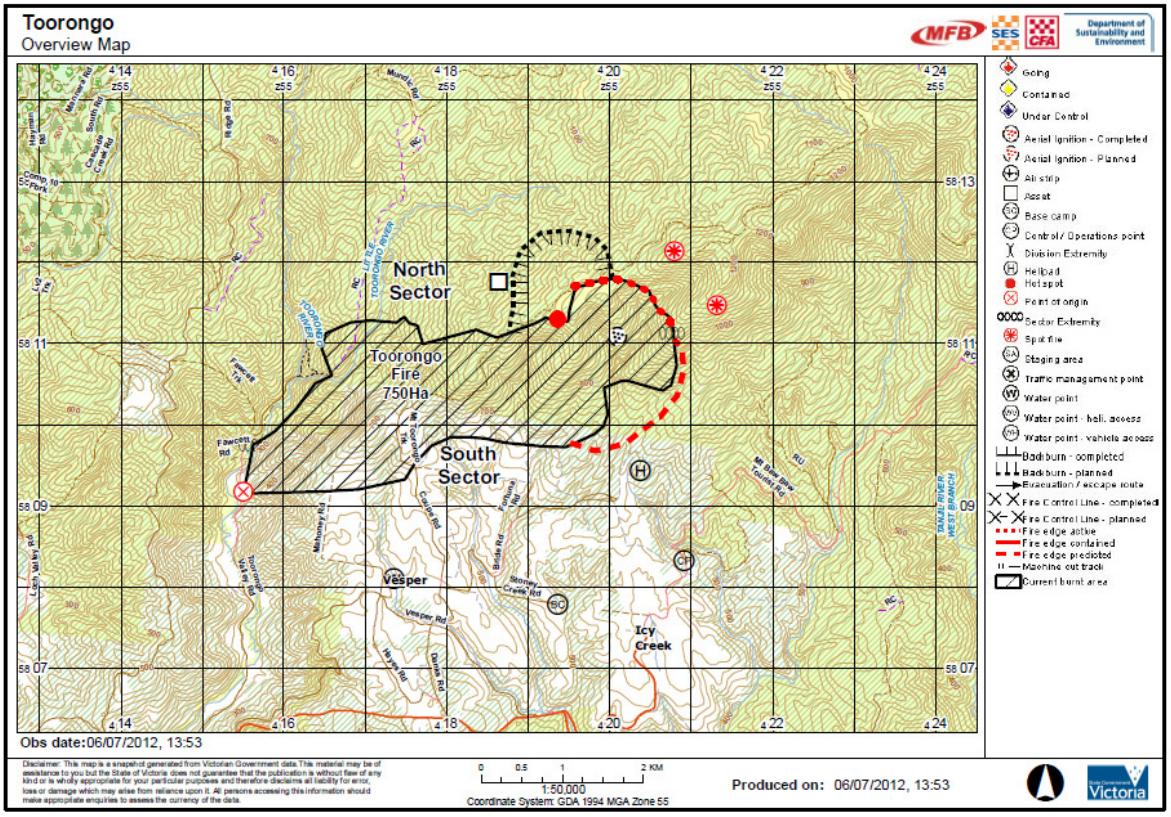


Figure 8: Incident Overview Map (source Department of Sustainability and Environment, Victoria)

The map should display all the relevant data required for incident control and could include:

- Known/estimated incident perimeter;
- Declared areas such restricted areas, control areas and quarantine areas;
- Problem areas;
- Division/sector boundaries;
- Incident facilities e.g. Incident Control Centre, Operations Point, Division/Sector Command Points, Staging Areas, Base Camp, airstrip, helibase etc.;
- Control line (if appropriate, e.g. for fire and flood) both proposed and constructed;
- Affected and unaffected areas (e.g. areas within the perimeter that are/are not burnt or flooded);

- Water points;
- Houses and other buildings;
- Hazards;
- Infrastructure (e.g. powerlines, pipelines etc);
- Rare and endangered flora and fauna etc;
- Specific types of asset related to the type of incident;
- Sealed/unsealed roads;
- Major/minor hydrography (streams/dams);
- Vehicle control points;
- Road closures; and
- Refuge points

Information on the base map must be clearly visible, readable and not obstructed by labelling or other text information put on the map.

Sector and Division labels should be placed at a reasonable distance away from the incident boundary.

Specifications for this map are:

- Scale is dependent on the size of the incident and the available data for the area. For example, in settled areas, the data could be sufficiently detailed for the map to be 1:25,000 or up to 1:100,000 or smaller. Large incidents or large unsettled or remote areas may only have sufficient data for a 1:100,000, 1:250,000 or 1:1,000,000 data. Incidents that cross state boundaries may have different scale data for each state.

  Individual sector maps may need to be developed if the incident becomes too large to fit on one page.
- The size should be A1 or larger.
- AO sizes with a clear overlay are required for the Operations Point and Incident Control centre and may be needed where briefings take place at staging Areas. Smaller sizes of the same map (e.g. A3) may be adequate for the individuals above as long as the scale is correct and useful and the maps are readable.
- Layers should be base topographic map data; incident control data; land tenure data and may include aerial photography and other images.

This map will need to be updated in preparation for briefings and handover for the next shift.

Situation Map

The Situation Map usually looks about one day ahead and is used to assist with planning a course of action to combat the incident. It is used by the Situation Unit to display the current and projected incident situation for planning purposes.

Situation maps could include:

- A summary of the current situation (e.g.. current incident perimeter);
- Likely future incident scenario (e.g.. projected incident perimeter);
- The key threats posed by the incident;
- The current incident control arrangements, such as Divisions and Sectors and the location of key incident facilities such as the Incident Control Centre, Operations Point, Staging Area etc.

As an example, a Situation map for a biosecurity incident could include

- Infected premises.
- Change in infected premises over time period.
- Change in other premises.

Strategic Map

Strategic maps (may be called a range of other names) are similar to Situation Maps but project over a longer timeframe.

Possible features of the strategic maps could be:

- **Timeframe** – the situation projected could range from several days to several weeks or months, depending upon the type of incident.
- **Scenarios** – the map could present a range of possible scenarios.
- **Values at risk** – the map could present the range of values at risk including communities, assets, and environmental features at risk from the incident.

The purpose of the Strategic Map is to assist with longer term planning (i.e. not for the immediate shift). The map will help identify the likely scenarios, the possible future situation and the likely threats from the incident.

Strategic maps will also be of interest from a 'whole-of-government' perspective and should help inform policy and planning for all agencies.

Maps for the Incident Action Plan

The Operations Section requires maps in the Incident Action Plan (IAP). These maps include:

- Incident Overview Map (same map as for the Planning Section but only smaller); and
- Division and/or sector Maps.

IAPs and their associated maps are generally updated for each work shift (although for some incident types, the plan and maps may remain the same for several days).

The information on IAP maps is critical for the safety of the operations personnel and the effectiveness of the incident operations.

Therefore the information must be clearly visible, readable and not obstructed by labelling or other text information.

Maps for use during nightshift should be easily readable in poor light.

Operational details such as division and sector boundaries need to be authorised by either the Situation Unit Leader, Planning Officer or the Operations Officer.

Incident Overview Map

The IAP usually contains a copy of the Incident Overview Map. This is usually the same map as developed for the Planning Section but printed on a smaller piece of paper suitable for carrying out to the field (usually A4).

This map contains the main features of the incident and its relationship to towns, major roads and access. This map gives incident respondents some context to the location of the incident and with access to the incident. It also includes division and sector boundaries.

Division/Sector map

An individual map is usually provided for each Division and Sector and this is usually at a larger scale than the incident overview map, with more detail, enabling Division and Sector Commanders to clearly see the essential detail of the area they are managing.

Scale: 1:25,000 or to 1:50,000. Note that the scale of the map should be appropriate to the scale of the data on which the map is based.

Size: A4 or A3

Layers: Base topographic map data; incident control data; land tenure data

These maps need to contain all the relevant data required for managing the Sector or Division including:

- Incident location and access;
- Direction of incident travel (e.g. an arrow showing the direction of spread of the incident, if it is spreading);
- Known/estimated incident perimeter;
- Problem areas (e.g. hotspots for fires);
- Division/Sector boundaries;
- Incident facilities e.g. Incident Control Centre, Operations Point, Division/Sector Command Points, Staging Areas, Base Camp, airstrip, helibase etc.;
- Refuge points
- Location of key assets requiring protection etc.;
- Control line (if appropriate, e.g. for fire)- both proposed and constructed;
- Affected and unaffected areas (e.g. areas within the perimeter that are/are not burnt or flooded);

- Water point;
- Houses and other buildings;
- Hazards;
- Infrastructure (e.g. powerlines, pipelines etc);
- Rare and endangered flora and fauna etc.;
- Specific types of asset related to the type of incident (such as water-related assets and dams);
- Sealed/unsealed roads;
- Major/minor hydrography;
- Vehicle control point; and
- Road closure.

Public information maps

These maps are for communicating information to both internal and external groups such as the community, the media, senior emergency management personnel, government and stakeholder agencies and they are often used for public briefings.

These maps are usually general in nature and do not contain a lot of technical detail. They usually cover:

- An incident overview;
- The direction in which the incident is likely to expand (e.g. for a flood or a fire);
- Major roads;
- Closed roads;
- Rivers and lakes;
- Towns; and
- Local references and major features e.g. mine sites etc.

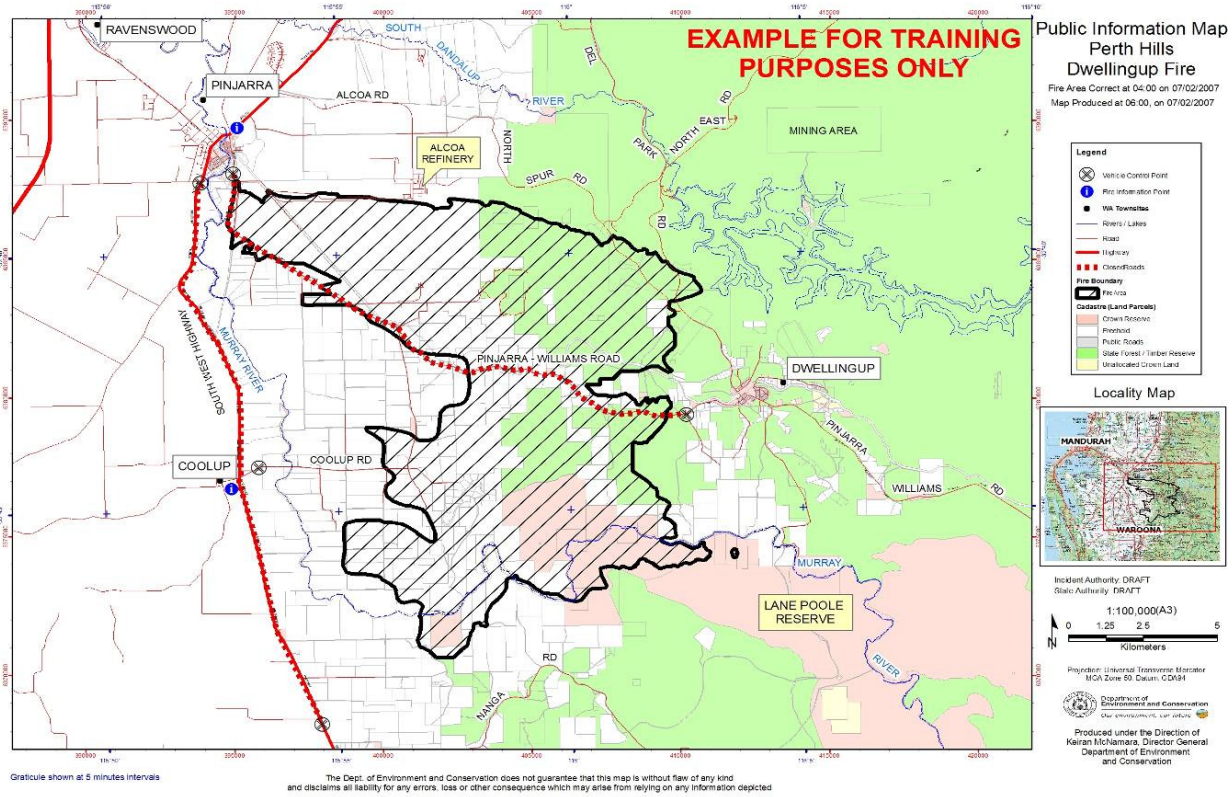


Figure 9: Public Information Map (source Department of Environment and Conservation, WA)

Agency-specific maps

Individual agencies will have their own maps in addition to those listed above. These include:

Preparedness map

Some agencies prepare a map which shows the location of resources, for example Incident Management Teams, in advance of an incident, for example on a day of forecast extreme fire weather or extreme rainfall.

Loss map

This displays the location of assets that have been damaged or destroyed during the course of the incident.

Recovery map

This shows the locations of rehabilitation or recovery actions required once the incident has concluded and could include the location of roads requiring grading, unsafe trees, damaged fences etc.

Communications map

This shows the location of radio repeaters.

Activity

Identify the standard maps used by your agency, the purpose of each map and who will use it.

Mapping standards

All maps produced for emergency management should include:

- Agency logo and disclaimer;
- Incident name and map type (e.g. Blue Rock incident – Incident Overview Map);
- When prepared (time, date and shift);
- The time and date when the information was collected;
- North arrow;
- Scale (including a bar scale);
- Grid lines;
- Legend; and
- Essential features.

Quality assurance and authorisation

Most agencies place considerable emphasis on the authorisation of data and mapping products to ensure incorrect data is not put on maps and that the maps are checked and authorised prior to release.

The Mapping Team Leader is responsible for ensuring that datasets and maps are properly authorised before they are finalised, copied and distributed.

Maps are often considered as a definitive record of the incident and are requested during Royal Commissions and coronial inquiries etc. It is critical the correct information is used and the maps are fit for purpose and will withstand organisational and/or public scrutiny.

Operational details such as division and sector boundaries will need to be authorised by either the Situation Unit leader, Planning Officer or the Operations Officer.

Timeliness

If a map takes too long to produce then it may not be useful anymore.

It is therefore important for the Mapping Team to clarify the time constraints for map production when the request is first received.

The use of standard agency mapping products will greatly assist the Mapping Team to produce maps on time as there are usually simple templates for the production of these maps.

Scale

A map needs to have the level of accuracy and currency required by the users of the map. Larger scale maps are good for tactical decision making (i.e. can be more easily used by ground personnel) and it is easier to measure distances and areas using them.

Use a bar scale (rather than a representative fraction, such as 1:25,000) as most operations personal do not carry rulers and the map scale may change with the copying process.

Maps which are not to scale need to have 'not to scale' written on the map

As previously explained, scale is dependent on the size of the incident, the available data for the area and the size of the page on which the map is to be printed.

Sensitive information

Maps, like other documents, contain information that may be either general (readily available to the public) or sensitive and which should only be available for managers or people with specific roles at the incident.

These days, open communication with the community is more commonplace. However it is still important to be careful about some types of information they may be misinterpreted, restricted for a specific purpose or too traumatic if released.

Types of sensitive information may include:

- Locations of rare or restricted flora, fauna or habitats;
- Locations of cultural heritage sites;
- Military information - e.g. the defence forces may not want the locations of their facilities known during combat of incidents on land controlled by them;
- Extent or location of the incident before it is timely to release it e.g. the extent of a landslide before it is established there are victims;
- Infected or infested premises (biosecurity); and/or
- Privacy-related data etc.

Graticules

The gridlines pattern on a map is called a graticule. Your GIS will give you a choice of the projection used for the graticule. Public Information maps will not need a graticule. However, maps for use in the field should include a graticule as grid lines make it much easier for distances to be judged.

Amount of information

The amount of data or information shown on a map influences the user's ability to find and use particular information they are interested in.

Maps that contain too much information may be cluttered and difficult to read and important information on the map may be missed altogether. Maps with a small scale representing steep terrain may be cluttered by contour lines. Too many labels or notations may also clutter the map.

Conversely, where there is insufficient information, the map may not be useful for its purpose. Again, decision-making and safety of personnel may be compromised by too little or too much information.

Paper size

A map should be of size suitable for its purpose but this needs to be balanced against the information it is required to show.

For example, a map designed for the wall of the Incident Control Centre can be bigger than a map to be used in a vehicle by a Sector Commander. Similarly, a map to be used by the media in a newspaper will need to be quite small..

A map may also need to be of a size that allows for growth of an incident. A change in scale or a series of adjoining maps will need to be considered if an incident is growing so that its map covers more than one page.

How the map is to be sent to another destination may influence the size of the map. If it is to be faxed then it will need to be either A4 or A3 paper size. A map larger than A4 or A3 will have to be mailed or hand delivery in a tube container.

Number of copies

The number of copies of a map depends upon who needs the map. The ability to make multiple copies may also influence how many copies can be made e.g. the availability of a colour printer or photocopier and the speed at which copies can be made.

The delivery of the copies to personnel also has to be considered. If multiple copies of the same map have to be available in a number of locations by a particular time then this may be a significant constraint and alternative methods of map transfer may need to be considered.

Finally…..

Always do final check of your maps to make sure:

- The title is correct;
- The incident name is correct;
- The time and date are correct for both the collection of information and the production of the map;
- The legend explains all details on the map;
- The scale bar is correct (check against the graticule [grid lines]);
- The graticule is correct; and
- The map has been approved by the Situation Unit Leader.

Always destroy maps that are incorrect.

Remember, perfect cartography is not as important as getting the incident data onto a map and out to Planning and Operations.

Summary

- Most agencies have a standard list of map products they use for the specific types of incidents they manage.
- Customised products can be made but the requesting person must be made aware that these will take longer to produce.
- An Incident Overview Map displays the whole incident and updates are added as information comes into the Incident Control Centre (ICC). This map is a 'running' record of the incident development.
- Situation Maps display the current incident situation and the projected incident situation.
- The Incident Action Plan (IAP) contains maps for operations personnel to use in the field. The information on these maps is critical for both the safety of the operations personnel and the effectiveness of the incident operations. These include:
    - Incident Overview Map - contains the main features of the incident and its relationship to towns, major roads and access. This is a smaller copy of the Incident Overview Map displayed in the ICC.
    - Division/Sector Maps - with more detail, enabling Division and Sector Commanders to clearly identify the essential detail of the map for the area they are managing.
- Public Information Maps are usually general in nature and are used to disseminate information to both internal and external groups such as for the community, the media, senior emergency management personnel, and government and stakeholder agencies.
- Other agency-specific maps include:
    - Preparedness maps displaying the location of resources, for example Incident Management Teams in advance of an incident;
    - Loss maps displaying the location of assets that have been damaged or destroyed during the course of the incident;
    - Recovery maps displaying the locations of recovery actions required once the incident has passed; and
    - Communications map showing the location of radio repeaters.
- All maps produced for emergency management should include:
    - Agency logo;
    - Title and incident identifier;
    - When prepared (time, date and shift);
    - Who prepared the map;
    - North arrow;
    - Grid lines;
    - Scale;
    - Legend; and
    - Essential features.
- If a map takes too long to be produced then it will not be useful anymore. Perfect cartography is not as important as getting the incident data onto a map and out to Planning and Operations.

- The use of standard agency mapping products will greatly assist the Mapping Team to produce maps on time as there are usually simple templates for the production of these maps.
- Maps need to have the level of accuracy and currency required by their users.
- Small scale maps are good for overviews and strategic decision making.
- Larger scale maps are good for tactical decision making (i.e. can be more easily used by ground personnel) and can be used for accurately measuring distances and areas.
- Types of sensitive information included on maps that should have a restricted audience are:
  - Locations of rare or restricted flora, fauna or habitats;
  - Cultural heritage sites;
  - Military information;
  - Extent or location of the incident before its timely release;
  - Infected or infested premises (biosecurity); and
  - Privacy–related data etc.
- The map should be of a size that suits the needs of its user e.g. a wall map should be large whereas a map that will be used in the car should be smaller.

Self assessment questions

1. Explain why agencies use standard maps in preference to customised maps.
2. Explain the purpose of the Incident Overview Map usually displayed in the Incident Control Centre.
3. What information is displayed on a Situation Map?
4. Identify the maps usually contained in the Incident Action Plan (IAP)?
5. What are the maps in the IAP used for?
6. Identify at least four different audiences for Public Information Maps.
7. Identify the features all maps produced for emergency management should include.
8. Why is timeliness important when producing maps during emergencies?
9. Do all maps have to be very detailed ? Explain your answer.
10. Give some examples of when small scale maps could be useful.
11. Give some examples of when large scale maps could be useful.
12. Give some examples of sensitive information on maps that should have a restricted audience.
13. What size should a map be?

Section

6

Self Assessment Answers

Section 6

Self Assessment Answers

Self assessment answers

Section 1: The Mapping Team

1. The Incident Management Team (IMT) comprises the Incident Controller, Planning Officer, Operations Officer, Public Information Officer and Logistics Officer.
2. The Planning Officer is responsible for the production of the Incident Action Plan.
3. The Situation Unit is responsible for the collection of situation information and the development of incident control options.
4. The Mapping Team is responsible for producing mapping information, with relevant supporting documentation in order to summarise and describe the incident situation.
5. The key roles in the Mapping Team are:
   - The Mapping Team Leader - responsible for obtaining work instructions and managing the Mapping Team to ensure that the products are delivered.
   - Mapping Team Members – work independently to collect and interpret incident and image data, and then apply GIS software to produce mapping products.
   - Mapping Team Assistants – work under supervision and produce basic mapping products.
6. The Mapping Team normally receives requests for mapping products through the Situation Unit Leader.

Section 2: Working in the Mapping Team

1. A well-performing team has a common purpose that is understood by all team members and on which each member plays their assigned role to the best of their ability to achieve this purpose.

2. A good 'team player':
   - Shares good ideas;
   - Finds ways to help people in their team;
   - Recognises good results; and
   - Asks for help when they need it to get a job done.
3. The key responsibilities of team members are to:
   - Communicate with team leaders and other members;
   - Co-operate with team leaders and other members;
   - Contribute skills and experience towards achieving team tasks; and
   - Share in the work and assist and support other members.
4. Some of the things you should keep in mind when receiving feedback are:
   - Keep an open mind and suspend judgment;
   - Listen and repeat or paraphrase what you have heard thereby confirming you understand what is being said; and
   - Focus upon the behaviours and facts rather than any emotions or subjective opinions being expressed.
5. Some of the things you should keep in mind when giving feedback are:
   - Focus on specific behaviours;
   - Keep it impersonal;
   - Focus on objectives; and
   - Time it well.
6. Some of the points that should be covered when reporting progress to the team leader are:
   - Progress made towards achieving the work objectives;
   - Identification of information that may affect the work of another team member;
   - Future resource requirements;
   - Future timeframes and timelines; and
   - Any predicted problems in completing work and subsequently the team objective.
7. It is important to work within the agency's policy and procedure framework because these ensure the agency complies with its legal obligations in areas such as equal employment opportunity, anti-discrimination and workplace health and safety.
8. If you notice a hazard in your workplace you should:
   - Say NO to working in unsafe conditions;
   - Report unsafe or hazardous conditions to your supervisor straight away;
   - Warn others at risk about the danger – where it is and how it happened;
   - Always ask yourself before starting a new job – can I get hurt doing this job? It you answer YES or MAYBE, talk to your supervisor right away.

Section 3: Spatial reference systems

1. Datum is a set of reference points on the earth's surface against which position measurements are made. Horizontal datum is used to describe a point on the earth's surface. Vertical datum is used to measure elevations or depths.
2. The two main types of coordinate systems are:
    - Geographic coordinates(for example, latitude and longitude – usually expressed in degrees or decimals); and
    - Projected coordinates (for example, a grid that represents the earth on a flat surface such as a page - usually expressed in metres).
3. The Geocentric Datum of Australia, 1994 (GDA94) has been adopted for use throughout Australia. GDA94 datum replaces the AGD66 and AGD84 datum throughout Australia. The Map Grid of Australia 1994 (MGA94) is the standard projection for large scale maps. Lambert (VG94) or Albers is the standard projection for small scale maps.
4. World Geodetic System 1984 (WGS84) is a worldwide reference system used by GPS. It is very similar to GDA94 (but not the same). This explains why GPS data may need to be converted to GDA94 prior to being able to be used in a GIS.
5. Data from different sources needs to be converted to the one datum and projection in order for it to be merged within a GIS. The GIS can do this.

Section 4: Symbology

1. The use of standard symbology for emergency service maps improves interoperability between agencies and increases efficiency and safety.

Section 5: Mapping products

1. Agencies prefer to prepare standard maps in preference to customised maps as they are much quicker and easier to produce. Customised maps can be produced but the person requesting the map needs to be advised that the map will take longer to produce. Production of customised maps could mean that the Mapping Team gets behind in its work and the Mapping Team Leader may need to reset priorities.
2. The Incident Overview Map displays the whole incident and hand-drawn updates can be added when people return from the incident. This map is a 'running' record of the incident development. A smaller version of this map is included in the Incident Action Plan (IAP).
3. Situation Maps usually display the current incident situation and the projected incident situation.
4. The maps Incident Action Plan (IAP) usually contains:
    - Incident Overview Map - contains the main features of the incident and its relationship to towns, major roads and access; and
    - Division/Sector Maps - with more detail, enabling Division and Sector Commanders to clearly identify the essential detail of the map for the area they are managing.
5. The maps in the IAP are used operations personnel at the incident. The information on these maps is critical for both their safety and the effectiveness of the incident operations.
6. Public Information Maps are usually general in nature and are used to disseminate information to both internal and external groups such as for the community, the media, senior emergency management personnel, and government and stakeholder agencies.

7. All maps produced for emergency management should include:
    - Agency logo;
    - Title and incident identifier;
    - When prepared (time, date and shift);
    - Who prepared the map;
    - North arrow;
    - Grid lines;
    - Scale;
    - Legend; and
    - Essential features.
8. Timeliness is important when producing maps during emergencies because if the map is late then it maybe of no use to the incident managers and could even hinder the process of controlling the incident.
9. Maps need to have the level of accuracy and currency required by their users.
10. Small scale maps are good for overviews and strategic decision making.
11. Larger scale maps are good for tactical decision making (i.e. can be more easily used by ground personnel) and can be used for accurately measuring distances and areas.
12. Sensitive information on maps that should have a restricted audience includes:
    - Locations of rare or restricted flora, fauna or habitats;
    - Cultural heritage sites;
    - Military information;
    - Extent or location of the incident before it is timely to release it;
    - Infected or infested premises (biosecurity); and
    - Privacy–related data such as ownership etc.
13. The map should be of a size that suits the needs of its user e.g. a wall map should be large whereas a map that will be used in the car should be smaller.