EXTRACTION BATCH CONTAMINATION

Batch: [redacted]

Contaminated profile:

- Position No: 7
- Lab No: [redacted]
- Case No: [redacted]
- Case details: Unlawful Use of Motor Vehicle, Greenslopes, Brisbane (unknown offender)
- Profile details: Unexpected complete female DNA profile obtained matching that in position 5 (unrelated sex assault complt)
  Sample = swab from right throttle of motorbike. No reference samples received in relation to this matter. Only one other sample received for this case, swab from left handlebar of motorbike, this profile NSD (position 6 sample 323288136 on same batch, refer below). All samples consumed and can't be re-sampled.

Contaminating profile:

- Position No: 5
- Lab No: [redacted]
- Case No: [redacted]
- Case details: Alleged Sexual Assault, Townsville.
- Profile details: Female DNA profile obtained from Oral swab of SAIK. This profile matches other DNA profiles obtained from the epithelial fractions of intimate swabs of this SAIK extracted via DLYS. Confident that this DNA profile is truly representative of the sample.

Compromised profile:

- Position No: 6
- Lab No: [redacted]
- Case No: [redacted]
- Case details: Unlawful Use of Motor Vehicle, Greenslopes, Brisbane (unknown offender)
- Profile details: Swab from left handlebar of motorbike No DNA profile obtained. This position was noted by the operator to be one of the positions affected (bent tip) when the 8tip arm crashed into the lysate deck (refer to audit entry for extraction batch for further details).

Compromised profile:

- Position No: 14
- Lab No: [redacted]
- Case No: [redacted]
- Case details: Burglary, Noosaville, unknown offender(s)
- Profile details: Incomplete male DNA profile from swab of bourbon can in garden (UKM1).

  Bent tip from position 6 was observed to possibly contaminate this position when 8tip arm crashed into lysate deck.

  Different from the two other samples analysed for this case;

  sample 365366413, position 13, swab from bourbon can in kitchen – complete male profile (UKM2)

  sample 365366399, position 10, cig butt from kitchen – mixed profile, male/female 1:1 ratio, UKM1 and UKM2 have not contributed, checks performed on all samples in the batch indicate that nothing else present in the batch would account for this observed mixture.)

  These results could be true results based on the case history, however in the absence of reference samples cannot perform further checks.

Notes:

- These cases appear to be unrelated, thus obtaining matching DNA profiles for the samples in positions 5 and 7 described above, considering case histories and locations, is considered an unexpected result.
- In my opinion, the results from positions 5 and 7 are not reportable, and neither are the results of position 6 and 14.
- There do not appear to be any other instances of obvious/detectable contamination events on this extraction batch – a high number of samples on the batch resulted in NSD profiles (56/96; 58%), the positive and negative controls showed expected results and the remaining samples that resulted in profiles appeared to be unaffected by contamination (batch macro and manual check), although this should also be checked by the reporting scientist at the case management level.

Notes by AM 14/10/08
ODL batch

Error A:
[redacted] Contaminated profile in STORE plate
[redacted] Insufficient DNA from substrate to draw any conclusions (no peaks what so-ever)
likely seal but can't rule other stuff out, must have occurred at lysate removal or prior …

confirmed profile of source [redacted] from substrate so this is reportable …

Error B:
From store plate results & batch audit
[redacted]contaminated 365366424 during crashing of probes (pos 6 into 14)
Both Lysates contain same profile, neither substrate could get any peaks – therefore unsure which contaminated what – therefore recommend don't report either …
This is the tip crash see batch audit entry (indicates that 6 contaminated 14)

Mechanism of error A
Seal most likely

Investigation:
Samples[redacted] were extracted on extraction batch CWIQEXT200800630_01 in positions 7, 6 & 14 respectively.

During the processing of this extraction batch there were some instrument errors encountered. Whilst removing the lysate supernatant (during the second step of removal) the probe of the instrument intended to access position 6 (sample of[redacted]) crashed into position 14 (sample [redacted]) thereby contaminating sample [redacted] with the DNA from [redacted]. During the investigation, the stored lysate and the stored substrate for both samples was re-extracted. Throughout this investigation, both the results from the initial extraction and any re-extracted material was analysed using Genemapper-IDX software with a peak detection threshold of 20RFU in order to gain the most information. Profiles obtained from the stored lysate for both samples yielded the same DNA profile, however no DNA profile could be obtained from the stored substrate. Therefore the true source of the DNA profile obtained could not be truly ascertained (although sample 323288136 in position 6 is the most likely).

During a review of all results obtained from samples extracted using the automated DNA IQ extraction procedure it was noted that sample [redacted] from extraction batch [redacted] position 7 matched to sample 320126679 from position 5 on the same extraction batch. Given the nature of the samples and the nature & other results obtained from the two different cases involved, it was thought that sample [redacted] (position 7) was contaminated by sample 320126679 (position 5).

During the investigation, the stored lysate for both samples were re-extracted, as well as the stored substrate. Throughout this investigation, both the results from the initial extraction and any re-extracted material was analysed using Genemapper-IDX software with a peak detection threshold of 20RFU in order to gain the most information.

The re-extraction of the stored lysate (i.e. material retained after removal from para-magnetic resin during the automated DNA IQ extraction process) for both samples gave results consistent with that obtained from the initial extraction process. From these results, it can be concluded that the contamination of sample [redacted] from sample [redacted] must have occurred prior to the separation of the lysis solution and the para-magnetic resin.

The re-extraction of the stored substrate (i.e. the material originally submitted for DNA extraction that passed through the initial stages of the original extraction process) gave differing results. No DNA profile could be obtained from the substrate of [redacted] However the substrate of sample [redacted] yielded a DNA profile that that obtained from the initial extraction process. This indicates that the DNA profile from this sample truly originated from that sample. This profile was also consistent with that obtained from other samples of a similar intimate nature from the same case.

The results obtained from the investigation therefore indicate that contamination of sample [redacted] from sample [redacted] has occurred after the manual lysis of the substrates (off-deck lysis procedure), but prior to completion of the removal of lysed material from para-magnetic resin during the automated portion of the extraction procedure.

The potential steps at which contamination may have occurred are outlined in Actions below.

Action:
The potential steps at which contamination may have occurred are:
1. During the transfer of the lysate obtained from manual lysis into the deep-well plate via the use of the Storstar. This however is considered unlikely. This is because lysate was added to well 5 prior to the addition of well 7 and with the two wells separated by well 6 (that failed to show evidence of contamination from the same profile) and the nature of the pipetting process whereby individual care is taken whilst performing the process.

2. During the removal of the adhesive seal used to seal the deep-well plate containing stored lysates awaiting automated DNA IQ extraction. This is the most likely as it was noted during Audit 8227 that condensation on the seal that could not be removed by centrifugation was a contamination risk.

3. There may have been operator error during the manual addition of DNA IQ para-magnetic resin during the start of the automated extraction procedure (i.e. incorrect pipetting procedure), however this is unlikely as staff are trained to perform such pipetting steps with due diligence and care.

4. During the 1st stage of removal of lysate from the para-magnetic resin to the storage plate. This procedure occurs twice during the automated extraction protocol (fresh disposable tips for each step). If there was bubbling of the lysate containing unbound DNA and this was to burst, contamination from well 5 into well 7 may account for the contamination event. However, the physical movement of the 8-tip arm during this liquid transfer makes this an unlikely proposition (i.e. once the tip retracts from well 5, it does not move directly over well 7).

Actions
As a result of previous OQI's raised and concerns identified around the automated DNA IQ extraction process, the extraction of samples using the automated DNA IQ procedure was halted on the 28-7-2008.

Prior to this Audit 8227 had been commissioned and carried out. A number of areas for improvement were identified through the audit, and these have been implemented or are under investigation as outlined in OQI's 20367, 20368 and 20369.

After the cessation of the automated DNA IQ extraction protocol, a review of all batches processed through this protocol was carried out by a specially commissioned team. A number of potential contamination events were identified and each is to be investigated on batch-by-batch basis.

Additionally, careful review of results obtained from samples processed through the automated DNA IQ extraction procedure prior to reporting will be carried out. Every DNA result obtained from these samples will be interpreted with caution.

Modifications have been made to the automated DNA IQ extraction procedure (including the use of an alternative to the adhesive seal and an alternative resin mixing procedure). This modified procedure will undergo extensive verification and approval from the DNA Analysis management team prior to re-introduction.

The contamination events and concerns and improvements etc. that surround the automated DNA IQ extraction procedure have been discussed at various departmental and team meetings.